Institutional Affiliate of American Congress on Surveying and Mapping.

The California Surveyor

No. 69 The Voice of the Land Surveyors of California Summer/Fall 1982

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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."

Personnel

Owner: California Land Surveyors Association
Editor: R. E. Baldwin, L.S.
Sales Manager: D. Calegari

Advertising

Commercial advertising is accepted by *The California Surveyor.* Advertising rates and information can be obtained by contacting Dorothy Calegari, P.O. Box 9098, Santa Rosa, CA 95405, phone (707) 539-3633

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.*

Unless indicated, all articles in this publication are prepared b the editor.

EDITOR: **R. E. Baldwin, L.S.**
1345 California St.
Berkeley, CA 94703

DEADLINE DATES FOR THE CALIFORNIA SURVEYOR

Winter ..... November 15, 1982
Spring ..... Febuary 15, 1983

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

Editor

Cover: James N. Dowden presenting Juanita Hall-Cobb with a plaque and original township plat for distinguished service on the Land Surveyors Committee of the Board of Registration at the 17th annual meeting of the California Land Surveyors Association. Awards were also presented to committee members Fred Seiji and Roy Nakadegawa.

New Products

REBUILT EDM BATTERIES

Alexander Battery Company West, has introduced rebuilt battery components for most E.D.M.'s. Lewis J. Reguly, sales representative, indicates you can save about 50% in replacement costs.

Currently rebuilt batteries for most Hewlett-Packard: K&E's Vectron and Auto Ranger and the Leitz Red 1A are bing made available upon trade-in at the factory. Mr. Reguly has requested users of E.D.M.'s not mentioned, to write to him and make arrangements to send him a burned-out battery of varying E.D.M.'s so his technicians can determine if they can set up the machinery to rebuild them.

Mr. Reguly's mailing address is: 11450 Cabela Pl., San Diego, CA 92127.

Remember this is a NEW item to hit the markets and the development thus far has been on the E.D.M.'s widely used in California. Mr. Reguly is anxious to see what can be done with other E.D.M. equipment, but he feels it will be at least as cost effective as those already available. Alexander Battery Company West is just exploring the marketability of batteries for the Land Survey related products.

□

GEODIMETER 140 TOTAL STATION

The Geodimeter 140 incorporates several features which contribute to productivity in the field.

Through a unique totally electronic angle-measuring system which uses a signal collected as a mean value over the entire surface of a circle (thus compensating for any disc imperfections), full angle accuracy is obtained in a single face measurement. Complex microprocessor circuitry also senses and immediately compensates for deviations from plumb and for the instrument errors which will occur in conventional theodolites. Thus, there is no need for transiting the instrument.

The distance-measuring function of Geodimeter 140 has a 1.5-mile range to a single prism, wide beam for easy target location, instant horizontal distance readout, fast tracking mode and Unicom speech transmission via the measuring light beam to the reflector carrier.

Angle and distance information can be transferred to Geodat data recorder by pressing a single key. Additional data can be entered via the keyboard. Data memory capacity is 500 to 1,000 measured points; unlimited storage is available by transferring data to a solid state memory unit or tape cassette.

For more information, contact AGA Geodimeter, Inc., 385F Bel Marin Keys Blvd., Novato, CA 94947; 800-227-1756 (in Calif. 800-772-2664).

□

LIETZ CENTENNIAL BELT BUCKLE

In celebration of its 100th anniversary, The Lietz Company has commissioned one of the country's finest craftsmen to produce a commemorative belt buckle depicting a surveyor "on the job". Made of solid brass, this buckle is finely engraved, richly detailed and finished in burnished antique. It's a buckle you'll be proud to own and wear! For additional information, contact Kristy Lantz, The Lietz Company, 9111 Barton, Box 2934, Overland Park, KS 66201.

□

LIETZ RED-2 EDM, SF2 KEYBOARD

The Lietz Company has released a new EDM, the RED-2 which measures up to 6,000 ft. to a Lietz single prism and 8,500 ft. to a Lietz triple prism assembly in less than 6 seconds in the measuring mode and 0.5 seconds in the tracking mode. Accuracy is ±(5mm + 5ppm) m.s.e. at −20°C to +50°C. Automatic attenuation, self-checking microprocessor that monitors circuitry to assure correct display, built-in 11x coaxial telescope and variable tone pointing are standard features, the seven-digit alpha/numeric LED readout directly displays distances in feet or meters, and RED-2 attaches to any theodolite with either yoke or telescope mount adaptor. An insertable 6V NiCd battery pack gives 800 continuous measurements on a single charge. Slope reductions, Northings and Eastings and stake-out distances are obtained with the optional SF2 keyboard that attaches to the RED-2.

For additional information, contact K. Lantz, the Lietz Company, 9111 Barton, Box 2934, Overland Park, KS 66201. (913-492-4990)

□

GEODIMETER EXTENDS INSTRUMENT WARRANTY

AGA Geodimeter, Inc., now offers with its Geodimeter 110, 112, 116, 122 EDMs and Total Station 140 an optional Extended Warranty Service Agreement. By purchasing the Service Agreement with a new instrument, the owner can fix both his service costs and downtime for two years.

Under the contract, AGA Geodimeter agrees to provide a similar loaner instrument free of charge if shop time, or anticipated shop time, exceeds 48 hours. During the contract period, the instrument owner also is entitled to a free calibration, even if service is not otherwise required.

□

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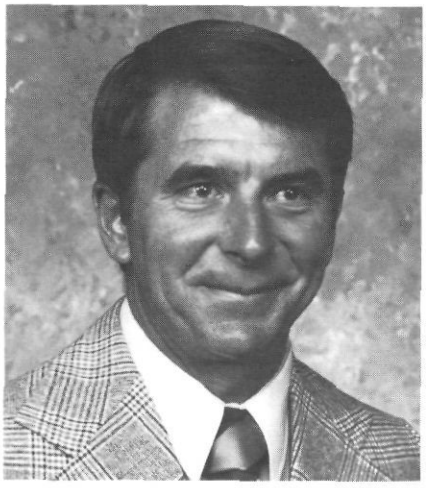

ABOUT THE AUTHOR:
Mr. Smith is a Licensed Land Surveyor with 14 years experience in the profession. He is 37 years old, holds a bachelor's degree from California State University, Los Angeles in Business Administration, and operates his own surveying firm in Bakersfield. He is a member of both C.L.S.A. and A.C.S.M.

by Reily Smith

The results of the Spring EDM poll are shown at right. The number of responses was disappointing and it would be hard to condemn a particular EDM when only one surveyor had bad luck -unless it was yours!

With modern theodolites and EDM's, hand-held radios are essential when making long shots. Let's conduct the next poll on hand-held radios. I have used several brands of FM radios and CB's and found that they all leave something to be desired. The itinerant frequency of 151.625 MHz sold in the FM's is almost as crowded in the Bakersfield area as the CB frequencies. It seems strange that, in this modern electronic age, there isn't a radio that is rugged and inexpensive with an honest two mile range. Every survey firm I know has a box full of radios that are not worth fixing. How do you feel?

There were a number of comments in the response cards that were not mentioned in the poll results because of space considera tions and some thoughts of my own I would like to share:

1. Why doesn't the EDM industry use the same prism constant with all of their retro-prisms?
2. After spending hours converting inches in architect and mechanical engineers plans to decimal feet, I almost wish we would go metric—just to have one common unit of measurement.
3. Have you ever tried to screw a prism directly to a tripod for a distance shot, only to find that the thread beginning in the prism case is so deep it won't work?
4. The POB manufacturers survey on transits and theodolites was good. All they need to do is include the warranty and trial test periods allowed for purchasers.
5. Why can't they make a good rod bubble that never needs to be adjusted?
6. The last two Linker rods I purchased have not worked right. Is it my usual bad luck; or, is their quality slipping?
7. One respondent to the EDM survey wrote that if a good field man had been allowed to make suggestions, all categories could have been 10's! This might apply to all of our equipment.
8. If anyone has used a "Tesco Tower," would you let us know how you liked it?
9. Some of you may have missed getting on the mailing list of "Professional Surveyor." Their mailing address is: P.O. Box 246, Falls Church, VA 20046. It is a "freebie" magazine with some good articles.

Perspectives

QUOTATIONS FROM THE PAST AND THOUGHTS FOR THE PRESENT

by Michael R. McGee, L.S.

One of the greatest challenges facing surveyors today, is to retrace the foot steps of those surveyors who preceeded us. To accomplish this, one must be more than diligent, one must almost be psychic. One should endeavor to put himself in the frame of mind of those original surveyors. To see the world as they saw it, the value of land, the hardships they endured, and the knowledge and professional exchange that was available to them.

These men who preceeded us were generally men of integrity and not at all unlike ourselves. We should not be too quick to criticize their methods and procedures for were we in their shoes, and knew what they knew, we would probably have made the same decisions.

There are a few books written on the subject of land surveying around the turn of the century, one of which I have found most interesting as related to our present day practice. Studying some of these older books is enlightening in that it helps one to follow in the foot steps of our predecessors.

One book well worth sharing was written by A.C. Mulford titled *Boundaries and Landmarks, A Practical Manual.* What's important to note is that this book was written in 1912 over 70 years ago. If you have had occasion to read this book I'm sure you'll agree that many of Mulford's quotations bear repeating.

In his chapter on the duties of the surveyor, Mulford states, "We have today fully entered upon an era of high land values, the high prices paid by the wealthy for lands from which to form estates have revolutionized the methods of handling realty. The title of all property must be absolutely quaranteed and payment is usually made by the acre. As a result, heavy demands are made upon the surveyor who finds himself confronted by two necessities, first the necessity of making an extremely accurate set of measurements and secondly the necessity of defining clearly the boundaries of the land which he must measure, and the latter is by far the harder task. These problems he must work out single handed and with the fear of failure shadowing him day by day and hour by hour."

It would appear from his statements that although the times change and the dollar is inflated a thousand fold, in the minds of men all things remain relative.

In his chapter on description of property he states, "The fundamental description of property however, is to be regarded as the deed and it is necessary first to consider the nature and intention of this instrument in order to understand why it is so often disappointing and deficient from the surveyors point of view."

"A deed is essentially a lawyers, not a surveyors document, its intention is to make the possession of a certain piece of land sure to the owner forever, not to give a minute description of the land for the comfort of the surveyor."

Later in the same chapter in addressing the procedure that a surveyor should follow in locating descriptions he discusses the aspects of doing a fence line survey or in his terms, "as occupied or as found in possession survey." He goes on to say that "The other method, which is generally adopted as the correct one is to endeavor to determine the boundaries of the land as originally intended to be conveyed."

This is not easily done today nor was it then, as he states in reference to a given description, "The courses in the above description are given only to a quarter of a degree which allows and practically necessitates an error of some minutes in the bearing of every course in the description. In the second place the original survey was probably run with an old fashioned surveyors compass, which is a crude instrument at best."

Regarding the duties of the surveyor he states, "In the vast majority of the cases the actual measuring of land forms the smaller portion of the duties, his hardest work is often, to use a colloquial phrase, to find the land to be surveyed."

In his chapter on the work and training of the surveyor he closes with, "When it comes down to a question of the stability of property and the peace of the community it is far more important to have a somewhat faulty measurement of the spot where the line truly exists than it is to have an extremely accurate measurement of the place where the line does not exist at all."

In his chapter, Responsibilities of the Surveyor, he states, "It is needless to say that the successful surveyor must be accurate in his instrument work and his computations yet if he were to really succeed he must go beyond this, he must add to this the patience to collect all the evidence which can be found bearing upon the case in hand together with the ability to weigh this evidence to a nicety and to determine clearly the course pointed out by the balance of probability. If in addition he possesses enough imagination to cast pleasant lights across the desert of dry details he should be successful indeed. The watchwords of surveyors are patience, and common sense."

He makes several good points in these chapters none of which have changed in 70 years. It is not sufficient to be trained in the ability to measure angles and distances to be a surveyor, although there are some who would think that Surveying 1A in their freshman year of college is all there is to know about surveying. He makes a second point that bears repeating, "It is far more important to have a somewhat faulty measurement of the spot where the line truly exists, than it is to have an extremely accurate measurement of the place where the line does not exist at all."

An over simplified example of this could be a situation where a

deed begins at a section corner and runs north along the section line 500 feet to the south line of John Doe, the surveyor measures out to first order traverse standards setting the point of beginning precisely at 500 feet. However, if inspection of John Doe's deed indicates his property is 510 feet north of the section corner, then that surveyor is in the wrong place. His measurements are precise but his solution is inaccurate.

One second theodolites, electronic distance measuring devices and computers will not make up for poor judgment or a lack of diligence on the part of the surveyor.

In this case a proper solution using a stadia rod would have been closer to where the line *truly exists.*

To reiterate, it is not enough for the surveyor to be able to measure the land but more so he must be experienced and educated in the art of the profession, of the alternatives and approaches to a boundary problem the easier ones are probably not the right ones.

In his book, Mulford also addresses the relationship of the surveyor to our closest professions the attorney and the engineer.

He states, "It is a curious fact that a great many lawyers who are continually dealing with land transfers are grossly ignorant of the simplest details of surveying -I should say that the minority know the number of feet in a chain.

As a result, many useful details which the surveyor, could gladly furnish in connection with a piece of land in question, are to many of them difficult of comprehension or absolutely meaningless. On the other hand the surveyor is probably equally ignorant of the law of property. A frank recognition by each, of his own limitations, is I think the first step to a sound understanding and furnishes a starting point from which both may work together toward accurate and satisfactory results."

With regard to the engineer, Mulford states, "The vocation of the civil engineer has always been invested with a dignity of its own but it seems to be that of late years in paying him the honor which is his just due we are apt to fix a little too wide of a gap between him and his humble brother the surveyor. We give engineering the chief attention in our technical schools but surveying we are wont to relegate to the freshman class, yet the profession of surveyor deals with one of the oldest and most fundamental facts of human society - the possession and inheritance of the land. Fire, flood and earthquake wipe out the greatest works of the engineer but the land continuouth forever."

It would seem from reading Mulford's book that he was a very modern and progressive surveyor, or perhaps things have not changed at all in 70 years.

In closing, I will leave you with one final quotation which sums up many of my feelings on the profession of land surveying.

He states, "Curiously enough the surveyor is isolated in his calling and therein lie his responsibility and temptations. The lawyer comes nearest to understanding the work, yet of the actual details of the survey most lawyers are woefully ignorant, the business man who can judge to a hair the fulfillment of contract, has no eye for the shortened line or the shifted land mark, to the skilled accountant of the bank the traverse sheet is a closed book. Dishonesty in ordinary business life cannot be long hidden and errors in accounts quickly come to light, but the faults or faulty survey may pass unchallenged through the years, for few but the surveyor himself are qualified to judge it. I maintain that in the hands of the surveyor to an exceptional degree, lie the honor of the generations past and the welfare of the generations to come, in his keeping is the doomsday book of his community, and who shall know if he is false to his trust? Therefore I believe that to every surveyor who values his honor and has a full sense of his duty the fear of error is a perpetual shadow that darkens the sunlight.

"Yet, it seems to me that to a man of active mind and high ideals the professional, singularly suited for the reasonable certainty of a modest income, must be added the intellectual satisfaction of problems solved, a sense of knowledge and power increasing with the years, the respect of the community, the consciousness of responsibility met and work well done. It is a profession for men who believe that a man is measured by his work, not by his purse and to such I commend it."

Your Association in Action

by James R. Dorsey,
L.S. Secretary

On August 7, 1982, the Board of Directors of the California Land Surveyors Association held their second quarter Board Meeting.

Some of the items discussed at the Board Meeting were:

A report that S.B. 1693 was suspended. This is the bill that would give surveying a separate authority to the Civil Engeineers Act and a CE exam in lieu of the L.S. exam to practice boundary surveying.

The Board of Registration for Professional Engineers is looking at Sunset Legislation and is asking a lot of questions as to why surveying, with the exception of boundaries, should be regulated.

It is pointed out that a surveyor is the sum of all of the elements that make up surveying. This includes topo, levels, quantities, geodetic as well as boundaries. The thought is offered that to deregulate the expertise required to perform such functions would create a hardship and a burden to the public.

One analogy is to not regulate dams or bridges because they make use of the survey data that is not regulated in their design and construction. So where is the responsibility if a bridge fails due to poor survey data used in its design. Perhaps with the Civil

Engineer who hired the surveyor. But then what recourse does the Civil Engineer have if surveying is not regulated and a surveyor has put his business on the line if he makes such a mistake.

Another important item discussed is your Association's operating budget. It is over extended.

This is the result of a deficit in the conference. By spending way beyond the budget in liaison with the Board of Registration as we go through hearings about deregulation and by a joint committee, with CCCE & LS and your Association to work out a means of implementing S.B. 2.

In addition, membership is down. This combines for about $10,000.00 deficit.

We ask you to support your Association. We can not continue to be responsive to the survey community without your support. If you are not a member of CLSA, join now. If you want to make a donation and not be involved, do it now. You may make the difference.

Since the Board of Directors Meeting, the joint committee met and reached what we all believe to be a good sound solution to the implementation of S.B. 2.

What is proposed:

Post 82 civils can perform all surveying except boundaries. They can not sign a map or condo plan. They can offer to perform as long as they hire someone authorized to perform surveying to do the actual work.

A post 82 Civil can practice boundary surveying only after passing the second half of the L.S. Exam and obtaining an L.S. License.

A land surveyor can offer to perform civil engineering work as long as the person doing the actual work is licensed or registered.

The person doing the actual work, whether he be engineer or surveyor, may be contract help. He does not need to be an officer of the firm.

A Land Surveyor can sit for the CE exam based on his L.S. License.

Both the Civil wanting to take the L.S. exam and the L.S. wanting to take the Civil exam must show two years of experience since the E.I.T. or L.S.I.T.

It is the recommendation of your association that this proposal be supported by the surveying community.

New Members 3/4/82 thru 6/30/82

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- Fair Oaks

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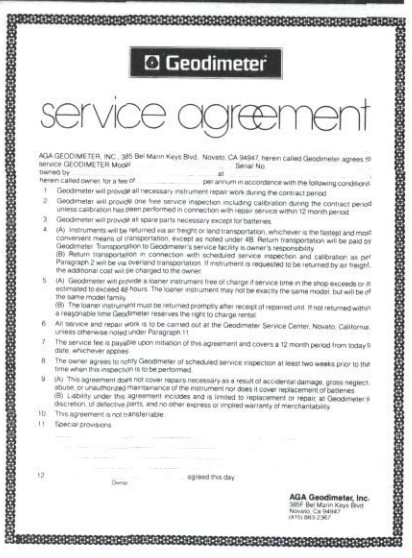

Geodimeter

service agreement

AGA GEODIMETER, INC., 385 Bel Marin Keys Blvd., Novato, CA 94947, herein called Geodimeter agrees to service GEODIMETER Model ____ Serial No. ____ owned by ____ at ____ herein called owner, for a fee of ____ per annum in accordance with the following conditions:

1. Geodimeter will provide all necessary instrument repair work during the contract period.
2. Geodimeter will provide one free service inspection including calibration during the contract period unless calibration has been performed in connection with repair service within 12 month period.
3. Geodimeter will provide all spare parts necessary except for batteries.
4. (A) Instruments will be returned via air freight or land transportation, whichever is the fastest and most convenient means of transportation, except as noted under 4B. Return transportation will be paid by Geodimeter. Transportation to Geodimeter's service facility is owner's responsibility.
   (B) Return transportation in connection with scheduled service inspection and calibration as per Paragraph 2 will be via overland transportation. If instrument is requested to be returned by air freight, the additional cost will be charged to the owner.
5. (A) Geodimeter will provide a loaner instrument free of charge if service time in the shop exceeds or is estimated to exceed 48 hours. The loaner instrument may not be exactly the same model, but will be of the same model family.
   (B) The loaner instrument must be returned promptly after receipt of repaired unit. If not returned within a reasonable time Geodimeter reserves the right to charge rental.
6. All service and repair work is to be carried out at the Geodimeter Service Center, Novato, California, unless otherwise noted under Paragraph 11.
7. The service fee is payable upon initiation of this agreement and covers a 12 month period from today's date, whichever applies.
8. The owner agrees to notify Geodimeter of scheduled service inspection at least two weeks prior to the time when this inspection is to be performed.
9. (A) This agreement does not cover repairs necessary as a result of accidental damage, gross neglect, abuse, or unauthorized maintenance of the instrument nor does it cover replacement of batteries.
   (B) Liability under this agreement includes and is limited to replacement or repair, at Geodimeter's discretion, of defective parts, and no other express or implied warranty of merchantability.
10. This agreement is not transferable.
11. Special provisions ____
12. ____ agreed this day.
    Owner

AGA Geodimeter, Inc.
385 Bel Marin Keys Blvd
Novato, Ca 94947
(415) 883-2367

new 2-year extended warranty agreement delivers 48-hour service turn-around

With Geodimeter instruments and Extended Warranty Agreement you can fix both your service costs and downtime for the next two years.

All our instruments (Geodimeter 110, 112, 116, 122 and Total Station 140) are covered by one-year Warranty (batteries and chargers three months.) Our affordable new Extended Warranty Agreement in effect extends this coverage for another year (except batteries and chargers.) It includes a free inspection and calibration. You pay shipping one way.

Field ruggedness and exceptional quality are built into every Geodimeter EDM. Now we've added peace of mind. Because if our Service Center cannot get your instrument on its way back to you within 48 hours, we'll loan you a similar model free.

Call our toll-free number for all the details and a hands-on demonstration of the model of your choice.

Geodimeter®

Nothing else quite measures up...

800-227-1756
(In California 800-772-2664)

AGA Geodimeter, Inc.
385 Bel Marin Keys Blvd., Suite F
Novato, CA 94947

News Briefs

IN MEMORIAM

We were saddened to learn that Bob Leger, L.S. 3166, passed away March 28 after a short illness, in Tuscon, Arizona, at the age of 52. Bob practiced in Santa Maria for a number of years before his retirement a couple of years ago. He was Chapter Representative for the Central Coast Chapter, and active in several CLSA committees. Bob is survived by his wife, Phyllis of Yuma, son Steve, daughters Jan and Lindi, two grandchildren, and a sister, Deani Stillers.

Professionalism

DUTIES OF AN EXPERT WITNESS

by Clyde F. Anderson

When an architect or engineer is sued by his client on a claim that he has been negligent in the design of a structure, the client should have a heavy burden to carry on his way to the architect's or engineer's pocketbook. This burden, imposed by the law, is a burden of proof and it should be a formidable enough burden to cause the client to pause and reflect before starting his suit against his designer. Unfortunately for the architectural and engineering professions, the thoughtless eagerness of some of their number is easing the burden of the client and transferring it onto the backs of their fellow professionals. Let me explain.

The law defining an architect's or engineer's obligation to his client is stated generally in the language employed by the Federal Court in Minnesota in the case of *Peerless Ins. Co. v. Cerny & Associates, Inc.,* 199 F. Supp. 1951:

> It is the law of Minnesota that ordinarily the standards of reasonable care, which apply to the conduct of architects are the same as those applying to lawyers, doctors, engineers and like professional men engaged in furnishing skilled services for compensation, and they are entitled to adequate protection and a wide discretion in determining what practices and principles are best suited for the work undertaken by them. In the instant case they would be required to perform said services for which they were engaged, in good faith with reasonable care and competence, and would be liable for damages occasioned by any failure to do so.

Or, as the New York Court put it in the case of *Major v. Leary,* 268 N.Y.S. 413:

> The law does not expect or require absolute perfection, but tests the efficiency of the architect by the rule of ordinary and reasonable skill usually exercised by one of that profession.

From these and numerous other cases that could be cited, it can be seen that the law recognized that in the design professions we are dealing with subjects where there is no one "right" or "wrong" answer but rather we are dealing with opinions and judgments of designers as to what may be the better answer for his client's problem under the particular circumstances presently confronting him. In doing this, the architect or engineer is entitled to "adequate protection and wide discretion" and is to be tested "by the rule of ordinary and reasonable skill usually exercised" by his profession. (From cases cited above.)

From my experience with architects and engineers I find that in many areas of design the practice among qualified and reputable men varies so broadly that it is difficult, if not impossible, to say what the "ordinary and reasonable skill" standard may be. Beyond that, if such a standard of conduct could be defined within rather broad lines by a rather extensive survey of an architectural and engineering community, it would be most unlikely that any individual architect or engineer would be aware of that standard in the absence of such a survey because ordinarily he is so busily engaged in tending to his clients' business within the confines of his own office.

Remember, the client has the burden of proving the standard of professional care as well as the defendant architect's or engineer's failure to measure up to that standard.

A great disservice is done the architectural and engineering professions when an individual architect or engineer undertakes to advise a non-client owner or attorney as to the boundary limits of acceptable or reasonable design standards of his profession unless he is *sure* that he is well acquainted with the relevant practices employed by a broad range of his fellow professionals. If he has such a broad knowledge of the design practices followed by other competent professionals in the specific area under question, and I suspect there are a few that have, then he must be very careful to discover and examine all of the facts and circumstances that were weighed by the designer in question before he can fairly render an opinion that such designer has failed to measure up to professional standards. For every architect or engineer who is critical of his brother professional in a discussion with a friendly non-client owner or his attorney at a golf club or bar must certainly expect to be called into court later, by subpoena if necessary, to restate those opinions and subject himself to stiff cross-examination.

A story may bring my thoughts previously expressed into focus. Several years ago I defended a doctor in an eye surgery malpractice case. It was the claim that he had used an unacceptable technique and this had produced a bad result. There was no question but that the patient had a bad result. We were defending the doctor on the theory that he had used an acceptable technique and had obtained an unfortunate result. Three doctors separately came into court, and each in turn criticized my client's employed technique and stated it was not good practice in the medical community each claimed that there was only one surgical technique that was acceptable by contemporary medical community standards and

that was the technique that he employed. The interesting point of the case is that on cross-examination it was shown that the individual technique that was used by each of the three was DIFFERENT. The defendant doctor received a favorable verdict.

You see, each of the three thought he was aware of the boundary limits of acceptable professional standards. In fact he was not. The consequences: (1) each was unjustly critical of his brother professional; (2) the profession suffered bad publicity; (3) great expense was unnecessarily incurred by the defendant doctor as well as his insurer. Perhaps worst of all, what posture will any of the three be in in the future if they should have the great misfortune of having a bad result in a particular case? It would seem that the patient has a ready-made list of committed experts available to testify in his behalf (the other two from the former case who said their way was the only acceptable way).

The outcome of a recent bodily injury suit against an architectural firm should bring the lesson closer to home.

The architects had designed a school addition in 1959, and six years after the new wing was completed, a six-year-old girl received severe cuts on the face and neck when she fell through a plate glass door in that section of the school. In addition to the physical pain of her injury, the child had suffered psychologically from the scars. All other defendants were let out of the parents' suit, and the trial centered around the propriety of the architects specifying plate glass for the doors.

The plaintiffs brought forward two formidable witnesses. One was a local glass supplier who demonstrated the differences between breaking ¼" polished plate glass, which shattered in jagged spikes, the tempered glass, which broke apart in small kernels and required a good deal more pressure to break.

The second witness was a highly-acclaimed architect. The architect cited twenty years of experience in the profession and confidently testified as to standards of practice in that region. He stated that, since 1950, the school board of a nearby major city required safety glass in all of its school structures. He also stressed the advantages of tempered glass, which is five times harder to break and, when broken, does not result in jagged edges.

As is true so many times, the best defense potential lies in the fact that the plaintiff's witnesses are eager to expound to their captive audience on how much better they could have designed the project. Consequently, they frequently over-reach and exaggerate.

On cross-examination, the defense was able to turn the tide of evidence. Examination of the architect's credentials revealed that only half of the expert's twenty years of experience had been in that region, and his capacity to define regional standards therefore appeared doubtful.

The architect was also forced to admit that there are disadvantages to using tempered glass, among them that it can be unbreakable to the point that serious concussion rather than cut can occure. In addition, tempered glass is difficult to replace because it cannot be cut after it has been tempered; it must be special ordered to size from the factory. It is also much more expensive than polished plate glass, and the plaintiff's expert had not even considered that, as is often the case, the school board had a very tight budget.

The defense then obtained testimony from the director of school construction in the city requiring safety glass in its schools. The requirement had not been put into force until 1961, two years after the architect designed the school addition in question.

Two employees of the largest wholesale glass firms in the region testified. Their companies together handled 60-70% of the glass business in the state and based on their experience with architects' plans and specifications submitted for bids, they testified that 90 to 95% of the plans and specifications for the year the addition was designed had called for the use of quarter-inch plate glass. They testified that, at the time of trial, over fifty percent of the architects outside the metropolitan area which required safety glass were still specifying polished plate glass in public school buildings.

Another architect of high reputation was called as a defense witness. His testimony made a pleasant contrast to the eager denunciation by the plaintiff's expert. This architect admitted that, although he had been in practice for about thirty years, he was unable to speak for any other architectural office as to the standard that existed in specifying glass for an entranceway. He brought his own firm's records for the period of time in question and revealed that all of the ten schools and church buildings designed during that time period specified quarter-inch plate glass.

Finally, the defense was able to counter the original expert's testimony that one major design firm set the standards for the area. This firm had designed another addition to the school where the accident occurred and had also specified polished plate glass for an enormous window near a wooden door. After that, it didn't take the jury long to find in favor of the defendant architects.

The points to be remembered from these cases are:

1. Do not become a self-proclaimed authority on the standards of practice in your community unless you, in fact, know the standards of conduct of other design firms in your area, or you may find yourself committed to a position which is not the standard.
2. As an expert witness, it is not your duty to testify as to how much better you could have done the job. You are obliged only to express your opinion on the adequacy of the original design to perform as intended.
3. Testimony should be tempered by the original budgetary and other limits on the project; obviously a designer given free rein with regard to design and cost will not be hampered by the same problems as a designer who must meet a preconceived plan and tight budgetary restrictions in his project.

This is not to suggest that design professionals maintain a "conspiracy of silence" when requested to serve as expert witnesses. However, expert testimony should be carefully tempered to give an unbiased evaluation of the profession's standards

rather than the expert's own inclinations.

BIOGRAPHICAL SKETCH OF CLYDE F. ANDERSON

Partner in the law firm of Meagher, Geer, Markham & Anderson, 400 Second Avenue South, 7th Floor, Minneapolis, Minnesota;

Engaged in the practice of law in Minneapolis for twenty-five years specializing in trial practice and defense of professionals;

Received Bachelor of Science in Laws degree from University of Minnesota in 1944;

Received Juris Doctor degree from University of Minnesota in 1946;

Member of Hennepin County, Minnesota State and American Bar Associations;

Past Chairman State Bar, Court Rules Committee;

Present vice president, Minnesota Defense Lawyers Association;

Member of International Association of Insurance Counsel;

Member of Federation of Insurance Counsel;

Fellow of International Society of Barristers;

Lecturer at University of Minnesota Continuing Legal Education seminars.

From the Editor

FINANCES

The last edition of *The California Surveyor* was the first to be printed by the firm which CLSA selected to use on a trial basis in an attempt to cut operating costs. Previous editions had been costing the Association over $1500; the Spring Edition resulted in an INCOME of $65 to CLSA. This is welcome news, as we can certainly use the savings for other programs. Your comments on the quality of the magazine are still welcome and will be used by the Board of Directors to evaluate the new printer's performance.

ARTICLES

In March of this year CLSA President Chuck Moore assigned various chapters the responsibility for providing articles for specific editions of *The California Surveyor*. Of the six Chapters assigned to provide articles for this edition, only the Humboldt Chapter actually came through (Michael Mc Gee's article printed in the Perspectives section). Plaudits and thanks!! (and a Bronx Cheer for you other Chapters).

The following Chapters have been assigned to provide articles for the NEXT edition (deadline is November 15):

Los Angeles / Ventura
Marin
Monterey Bay
Mother Lode
Northern California
Orange County

NEW EDITOR

This edition of *The California Surveyor* is my last. I have thoroughly enjoyed putting the magazine together, but more than this have enjoyed the company of the hardworking, dedicated people who spend their own time to make CLSA work for all of us. I know that they, and you the reader, will give the new editor the same support and encouragement that I enjoyed.

I hope you got as much out of reading this rag as I got out of editing it; if so, my time and yours has been well spent.

R.E. Baldwin Editor □

Conference

The 1982 C.L.S.A. Conference held in San Diego this past April proved to be a fairly relaxed affair as Conferences go. Attendance was down compared to past conferences, primarily due to economic conditions, but the smaller numbers seemed to make for a more congenial, easy-going atmosphere.

A.C.S.M. President Ira Alexander and N.S.P.S. President Don Bender officially opened the Conference, and discussed the variety of activities their organizations are involved in at the national level, and the problems that they foresee in the future. Of particular importance is the fact that they have formed a Political Action Committee. Michael Schulman, Public Member of the Board of Registration, then spoke on new developments in the State Regulation of Land Surveyors.

The technical sessions were informative and diverse, covering such topics as computer graphics, understanding your client, the effects of the Economic Recovery Act of 1981, rattlesnakes, mechanics leins, and professional liability among others. Social activites included a 10 km run, golf and tennis tournaments, a dinner dance, and an evening in Mexico.

A highlight of the Conference was a presentation by Board of Registraion Land Surveyors Committee members Juanita Hall-Cobb (Public Member), Roy Nakadegawa (C.E. Member), and Fred Seiji (L.S. Member). The discussion shed a great deal of light on the functioning of the Board, but more important revealed the Board Members to be not only accessible but genuinely desirous of an ongoing exchange of ideas and concerns.

Some twenty-two exhibitors also came to San Diego, bringing the latest in field and office equipment and plenty of expertise on how to get the most out of it. Also well represented at this conference was computer and calculator software for surveyors.

Thanks to all those who helped to make this Conference a success - the exhibitors, the speakers, the Conference Committee, and all of those who attended.

Letters

Editor: Mr. Dunbar's letter (Cal. Surveyor No. 68, pg. 11-Ed) deserves some comment. Although his letter appears to address a simple problem in simple terms, he addresses a far more serious problem which deserves more comment.

What should be shown on a record of survey? On the one extreme, we could show all positions reduced to the surface of some specific mathematical spheroid model. On the other extreme, we could show the name of the person actually making the measurement, the serial number and model type of the instrument used and the raw data (no mathematically doctored data like horizontal distances). Between these two extremes are an infinite number of choices of which we have now a working operational choice. We show the results of the reductions of those raw measurements fit into a mathematically perfect model so that each position represents the most likely position based on the raw measurements obtained.

Power calculators have made possible better raw data to best estimate of position conversions. If the raw data is carelessly obtained, the best estimate of position won't be very good. On the other hand, if the raw data *is* carelessly obtained, he is in violation of the Land Surveyor's Act.

When the surveyor signs the Record of Survey, he certifies that the data was not carelessly obtained, that every reasonable effort has been made to use the data to make a best estimate of each position on the map.

It is my opinion that, that is why it requires a license to sign the Record of Survey. If only the raw data were listed, then it would take a license to *READ* a Record of Survey.

by: Joseph H. Bell
Survey Engineer II

□

Editor: I am making a collection of excerpts from original field notes or very old surveys which portray some of the frustrations, interests and humor of the early surveyors.

U.S. Deputy Surveyor Sherman Day writes:

"On Saturday morning, 18th June [1851], on my way out from camp I accidentally left my note book on an oat hill that was on fire and walked a mile or two before I missed it. On returning I found only its ashes. I had lost the notes of all the 12 miles of zigzag line through Townships 1 & 2 S, R2E, (Mt. Diablo Meridian) the notes of the random line, and 2 miles of the true southern boundary."

Although I can't imagine "walking" away from a wild grass fire, I *can* imagine why he laid his notebook down. I do know the ground he had covered, and the loss of those notes was a genuine tragedy. Stories like this provide an insight into surveying that would, I believe, interest even the layman, and I hope to publish a collection of them. I would include the names of any of your readers who make contributions.

Kenneth G. Lamb, L.S.

Editor's Note: Readers wishing to contact Mr. Lamb may do so at 426 El Caminito, Livermore, California 94550

□

Editor: The Land Surveyor licensing examination given last October represents a failure on the part of the California Land Surveyors Association and the Board of Professional Engineers in the performance of an important public trust. The 1981 test has been widely perceived as being very 'one-sided'; it contained no questions relating to most areas of knowledge generally considered to fall within the responsibility and purview of the licensed land surveyor. Following is a list of major subject areas which have traditionally been well represented on the L.S. tests and the corresponding point value in the 1981 exam.

Subject	Possible Points on the 191 Exam
Astronomy	0
California Coordinates	0
Triangulation	0
EDM	0
Adjustments (statistical)	0
Construction Surveying	0
Earth Work	0
Photogrammetry	20
Boundary Resolution and Recordation	110

Surveyors must, of course, know the law relating to boundary resolution. However, they have always been expected to be expert in making and evaluating measurements. This expertise requires, for example, a familiarity with mathematics at a fairly theoretical level; in particular, it requires a knowledge of statistics. While much routine mathematics is facilitated by hand-held calculating devices, problems concerning the statistical compilation and adjustment of survey measurements involve subtle matters of reasoning and judgment.

The public needs to be sure that someone licensed as a Land Surveyor by the State of California has sufficient mathematical expertise to conduct his land surveying business in a professional manner. However, now it seems that this is not being tested for in the licensing procedure. (The LSIT is not a necessary requirement for an LS, and besides, only tests for more rudimentary mathematical ability.)

Upon inquiry, I have discovered that the testing committee of the California Land Surveyors Association had some organizational difficulties last year and formulated the 1981 test at the last minute, in some extreme haste. Consequently I was informed that is is understandable that the test would be less than adequate.

Perhaps the California Land Surveyors Association isn't sufficiently organized to act in a liaison role with State government. In this particular case, the CLSA has certainly not lived up to a significant public trust: that of insuring the validity of the State Licensing process.

I suggest that the State of California more closely monitor the test making procedure within the California Land Surveyors Association.

Lewis Soloff □

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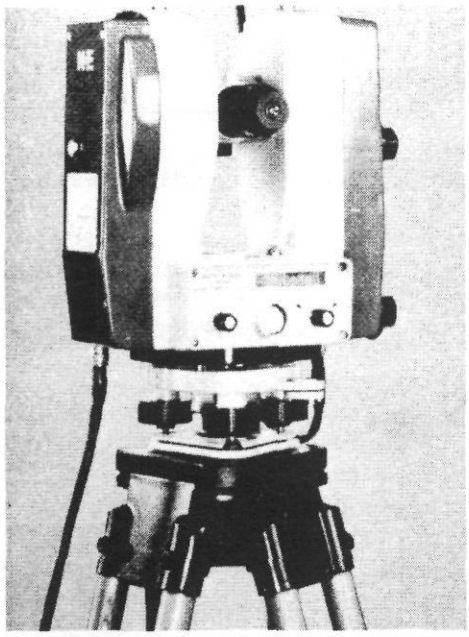

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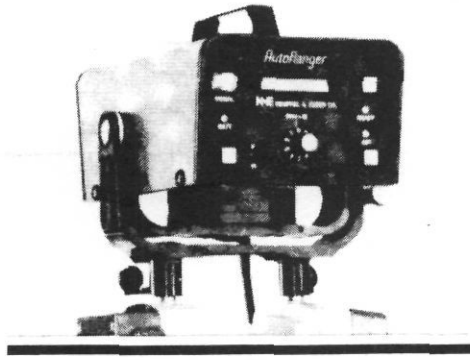

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News from the Board of Registration

Jim Dowden

The Professional Engineers Board is very pleased to announce that on July 19, 1982, Mr. James Dowden will have joined the Board staff as a Program Manager for land surveyor exam preparation and administration activities.

Jim brings to the Board coniderable expertise in land surveying matters; expertise gained through his many years of service to the State Lands Commission and his very active involvement with professional organizations.

Among Jim's duties, as staff to the Board, will be application review, providing assistance to enforcement staff, preparation of portions of the Board newsletter, staff to the Board Land Surveying Commmittee and liaison with professional societies.

TIDELANDS INVENTORY REPORT

Review of article "Tidelands Inventory Report" from California Landworld, *Vol. 3, No. 5, March 1982, contributed by Leroy Weed, L.S.*

Copies of the State Lands Commission Tidelands Inventory Report are available (at cost) from the State Lands Commission, 1807 13th Street, Sacramento, CA 95814. Costs of the report are as follows:

a. Main Report, 985 pp	$25
b. Appendix (by coastal County - specify)	$2.50 ea.
c. Offshore Islands	$2.50
d. Complete set of the above	$65

The report is the result of five years work by the Tidelands Inventory Unit and is the first phase of a program set up by Chapter 706, Statutes of 1975, that will eventually result in firm boundaries for coastal tidelands. An interesting aspect of the program is that the bill requires the State Lands Commission to fix boundaries in areas of naturally fluctuating shoreline and the Commission staff is now mapping and describing the tideland boundaries as fixed lines. The report covers only the coastal portion of the State, and does not cover inland waters.

To preview the report prior to ordering, check your local library since copies have been sent to all "Complete Depository Libraries". □

CADASTRAL SURVEYS

Submitted by Clifford A. Robinson, Chief, Branch of Cadastral Survey, California B.L.M.

This is to inform you of official cadastral surveys in California which have been accepted in the third quarter of FY-82 (April 1 -June 30). These surveys are now on file in the Survey Records Office, Bureau of Land Management, California State Office, 2800 Cottage Way, Sacramento, California 95825.

The accepted surveys are listed below by township, range, meridian, and acceptance date.

Township & Range	Meridian	Date Accepted
T. 10 N., R. 9 W.	Mt. Diablo	05-03-82
T. 47 N., R. 8 W.	Mt. Diablo	05-05-82
T. 2 S., R. 17 E.	Mt. Diablo	05-05-82
T. 19 N., R. 5 E.	Mt. Diablo	05-07-82
T. 24 N., R. 3 E.	Mt. Diablo	05-12-82
T. 7 S., R. 9 E.	San Bernardino	05-17-82
T. 32 N., R. 9 W.	Mt. Diablo	05-17-82
T. 37 N., R. 9 W.	Mt. Diablo	05-18-82
T. 11 N., R. 32 W.	San Bernardino	05-28-82
T. 48 N., R. 3 E.	Mt. Diablo	06-01-82
T. 20 N., R. 4 E.	Mt. Diablo	06-11-82
T. 4 N., R. 18 E.	Mt. Diablo	06-16-82
T. 34 N., R. 11 W.	Mt. Diablo	06-17-82
T. 25 S., R. 38 E.	Mt. Diablo	06-22-82
T. 29 S., R. 41 E.	Mt. Diablo	06-28-82
T. 30 S., R. 42 E.	Mt. Diablo	06-28-82
T. 4 S., R. 27 E.	Mt. Diablo	06-30-82
T. 33 N., R. 9 W.	Mt. Diablo	06-30-82

Supplemental plats in the following townships were also accepted during the third quarter:

T. 16 N., R. 2 E.	Humboldt	05-04-82
T. 26 N., R. 16 E.	Mt. Diablo	05-18-82
T. 5 S., R. 3 E.	San Bernardino	06-25-82

□

NSPS NOTICE OF AWARDS

The National Society of Professional Surveyors is sponsoring four awards to be given for excellence in the surveying profession this year. The awards are:

1. SURVEYING EXCELLENCE AWARD

Chairman: M. Louis Shafer
520 Loretto Drive
Roseville, CA 95678

This award is presented to a person who has performed outstanding service to the surveying profession. It is not necessary that the person be a surveyor or member of NSPS or ACSM, but candidates must be nominated for the award by an ACSM affiliate section or two NSPS members at large. This award includes an engraved plaque and a $500 honorarium contributed by Technical Advisors, Inc., Wayne, Michigan.

2. SURVEYOR PROJECT OF THE YEAR AWARD

Chairman: Ms. Kelly Olin
3526 "M" Street
Sacramento, CA 95816

This award is presented to the best paper describing a surveying project in which the candidate directed or participated. The project need not have occurred within the preceding 12 months to be eligible. This award includes an engraved plaque and a $200 honorarium from NSPS.

3. STUDENT PROJECT OF THE YEAR AWARD

Chairman: David R. Knowles
2448 Elaine
Fayetteville, AR 72701

This award is presented to the student who writes the best paper describing a survey related project in which the student was a participant. The writing of the paper must be an individual effort. Any undergraduate student enrolled in

a surveying or surveying related program is eligible for this award. The award includes an engraved plaque, a $100 honorarium contributed by Landmark Enterprises, and travel expenses to the ACSM / ASP spring meeting.

4. EXCELLENCE IN PROFESSIONAL JOURNALISM

Chairman: R.B. Buckner
1958 Neil Avenue
Ohio State University
Dept. of Geodetic Science
Columbus, Ohio 43210

This award is presented annually to the affiliate society whose newsletter is judged to have the highest quality during the previous year. The award is an engraved plaque and is presented to the editor of the newsletter at the awards ceremonies during the annual convention.

Questions pertaining to or requests for the guidelines of any of the four NSPS awards should be addressed to the Chairman of the award.

SURVEYING REGULATION IN CALIFORNIA

Preliminary Findings August 18, 1982

A surveying task review of: Land Surveyors, Civil Engineers, Photogrammetric Surveyors, Consulting Engineers in Photogrammetry.

The preminary report dated August 18, 1982 and printed below is the result of a series of public hearings and input to the Board of Registration over the past several months by the Board Liaison Committee of CLSA.

All Land Surveyors are urged to fully read and understand the implications to Land Surveying in California contained in Item 4 (A) to (F).

Your reactions to this report should be directed to Vince Sincek, L.S. Chairman, Board Liaison Committee of CLSA, with copies to Association Headquarters.

PRELIMINARY SUMMARY OF FINDINGS

• It is estimated that 1300 to 1400 land surveyors, 4000 to 5000 civil engineers and 500 dual licensees currently practice surveying in California (either part time or full time). (Comments received indicate the number of civils doing some surveying *may* be as low as 1750.)

• During the 21 month period between June 5, 1980 and March 31, 1982 the Board received 238 complaints of probable violation of the Land Surveyors' Act. Of the 238, 130 (55%) were received from the public, 61 (26%) from the profession and the remaining 47 (19%) from other agencies or internal operations.

• Of the 238 field investigated land surveying complaints filed with the Board, the breakdowns by major category are:

1. Unlicensed Practice	29%
2. Contractural - Land Surveyors	15%
3. Incompetence - Land Surveyors	12%
4. Contractural - Civil Engineers	11%
5. Incompetence - Civil Engineers	10%
6. Fraud - Deceit - Land Surveyors	10%
7. Fraud - Deceit - Civil Engineers	7%
8. Other	6%
Total	100%

Additional Preliminary Findings, Based on Information Received Through August 1, 1982 and Response to Questions in Introduction of Report

1. *Were there failures of the regulatory process prior to SB-2?*

A. A review of surveying complaints received by the Board over the past 2 years does not show any substantial difference between complaints against civil engineers and complaints against land surveyors.

B. These complaint statistics show possible problems with both civil engineers and land surveyors in contract preparation and in making consumers aware of the total cost involved.

C. Although surveying encompasses activities other than boundary determination, almost all of the complaints of incompetence relate to boundaries.

D. Almost one-third of the complaints are of unlicensed practice. Much of this problem appears to be as a result of confusion in the definition of surveying. Certain tasks are not clearly defined in the Acts.

E. A review of complaints supports that many boundary problems could be avoided if some means of arbitration could be developed. Many complaints develop because two professionals cannot agree on the best survey solution, causing a consumer to seek Board assistance.

2. *Are Civils qualified by education, experience and testing to do all or only a limited activity in surveying?*

Unless complaint statistics are made available showing a problem, the Board should assume that engineering provisions requiring persons to "work only in their area of competence" is an adequate consumer safeguard.

Any change restricting surveying to a smaller group of professionals will likely raise the cost of services to consumers.

Pre-SB-2 arguments stressed an educational problem in that colleges and universities no longer teach surveying to civils. Complaint statistics do not support any particular problem with newly registered civils. Statistics, in fact, show there may be more of a problem with pre-1970 civils and land surveyors pointing out a need for re-education.

3. *Are the limitations of SB-2 in the best public interest?*

The Engineers' and Land Surveyors' Acts as currently written are confusing to the public, the applicant and the practitioner. Post-1982 civils are unsure of their legal right to practice aspects of civil engineering and the Board's ability to enforce statutory provisions of law is increasingly restricted because many enforcement actions require a legal interpretation before staff can answer questions of legitimacy.

Tasks restricted to civils and to land surveyors should be clearly defined in the appropriate section of each Act.

4. *Should the Board propose statutory change to the Engineers' and/or Land Surveyors' Act?*

The final staff recommendation on this matter will be delayed until the September Board meeting because staff expects additional information to be provided from several societies.

As a guide to the type of recommendation expected based on facts received to date, staff in-

cludes the following:
A. Place a direct definition of restricted tasks for civils in the Engineers' Act and for Land Surveyors in the Land Surveyors' Act. Do not retain current cross-over provisions where civil provisions are referenced in the Land Surveyors' Act.

B. Since boundary (property) determinations apear to be the only real consumer complaint problem, restrict the right to establish or re-establish boundaries, corners or monuments between lands not held in common ownership to persons passing the land surveyor exam.
C. Since boundary determinations are the major problem area for registrants, place a minimum experience requirement for all land surveyor applicants dealing with field and/or office boundary determination work.
D. Add problems for testing applicants in contracts to the land surveyor examination.
E. Eliminate the January 1, 1982 provisions modifying activities of civil engineers.
F. Allow pre-January 1, 1983 civils and land surveyors to retain all previous rights, but require additional training and/or testing in boundary laws and contracts. All land surveyors and civils wanting to practice land surveying be completed within (2) years after this statutory revision takes place.

Upon completion of this training/testing qualifying civils may be issued, by the Board, a land surveyor license. The training to be approved by the Board. □

Advertisers' Index

Sustaining Members

SUSTAINING MEMBERS (Continued)

The California Surveyor

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The California Surveyor

No. 69 The Voice of the Land Surveyors of California Summer/Fall 1982

Table of Contents

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."

Personnel

Owner: California Land Surveyors Association
Editor: R. E. Baldwin, L.S.
Sales Manager: D. Calegari

Advertising

Commercial advertising is accepted by *The California Surveyor.* Advertising rates and information can be obtained by contacting Dorothy Calegari, P.O. Box 9098, Santa Rosa, CA 95405, phone (707) 539-3633

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.*

Unless indicated, all articles in this publication are prepared by the editor.

EDITOR: **R. E. Baldwin, L.S.**
1345 California St.
Berkeley, CA 94703

DEADLINE DATES FOR THE CALIFORNIA SURVEYOR

Winter ..... November 15, 1982
Spring ..... Febuary 15, 1983

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

Editor

Cover: James N. Dowden presenting Juanita Hall-Cobb with a plaque and original township plat for distinguished service on the Land Surveyors Committee of the Board of Registration at the 17th annual meeting of the California Land Surveyors Association. Awards were also presented to committee members Fred Seiji and Roy Nakadegawa.

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Lietz RED-2	32.00	19.20	12.80
Lietz RED-mini	22.00	13.20	8.80
Topcon GTS-2	45.00	27.00	18.00

	1-10 Days per day	11-90 Days per day (of 30 day minimum)	90 + Days per day
Electronic Distance Meters			
Hewlett-Packard 3820A Total Station (3 mile range)	120.00	90.00	60.00
Hewlett-Packard 3810A Total Station (1 mile range)	65.00	39.00	26.00
Hewlett-Packard 3808A Distance Meter (6 mile range)	50.00	30.00	20.00
AGA Geodimeter 120 EDM w/Slope Dist. & Vert. Ang. Sensor	60.00	45.00	30.00
AGA Geodimeter 120 EDM w/TM 1A one second theodolite	85.00	60.00	40.00
AGA Geodimeter 120 EDM w/TM-6 or TM10E six or ten second	80.00	57.00	38.00
AGA Geodimeter 120 EDM w/T60D one minute theodolite	75.00	55.00	36.00
Lietz Red-1 or RED-1A Distance Meter (2 mile range)	30.00	18.00	12.00
Pentax PM-81 EDM w/Slope Reduction (2 kilometer range)	30.00	18.00	12.00
Nikon ND-160 EDM w/Slope Reduction (1.6 kilometer range)	30.00	18.00	12.00
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Topcon Guppy semi-total station (1 kilometer range)	40.00	24.00	16.00
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One second theodolite (Lietz TM-1A)	30.00	18.00	12.00
Six second theodolite (Lietz TM-6 or Pentax TH-06D)	24.00	14.40	9.60
Ten second theodolite (Lietz TM-10E or Pentax TH-10WA)	20.00	12.00	8.00
Twenty second theodolite (Lietz TM-20C or Pentax TH-20WA)	18.00	10.80	7.20
One minute theodolite (Lietz T-60D or Pentax TH-60S)	17.00	10.20	6.80
One minute construction theodolite (Nikon NT-1)	12.00	7.20	4.80
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One minute open transit (D/W Path TR-300)	7.00	4.20	2.80
Auto. Level. 32X Engrs. (Lietz B-1 or Pentax PAL-2)	10.00	6.00	4.00
Automatic Level. 32X Engineers level (Lietz B-2C)	8.00	4.80	3.20
Automatic Level. 30X (Lietz B-2A) or 28X (Pentax PAL-3C)	7.00	4.20	2.80
Automatic Level. 25X (Lietz C-3A) Engineers level	6.00	3.60	2.40
Automatic Level. 24X (Pentax PAL-5C) or 22X (Lietz B-4)	5.00	3.00	2.00
Construction Level-Transit (David White model 8300)	5.00	3.00	2.00
Construction 12 inch Dumpy Level (David White model 8114)	3.00	1.80	1.20
Positioning Equipment			
Motorola Mini-Ranger with two coded transponders	200.00	105.00	70.00
Each additional Mini-Ranger coded transponder	36.00	18.00	12.00
Mini-Ranger Printer	15.00	6.00	4.00
Raytheon DE-719B Recording Fathometer	25.00	15.00	10.00
Computer Systems			
HP-85A with 16K mem. module and L&L Surveying Software	16.50	9.90	6.60
HP-85A systems with disk drives and/or printers available upon request			
Hewlett-Packard 9815-S (3841B) with Surveying Software	25.00	15.00	10.00
Hewlett-Packard 9871A Printer with 9815-S interface	22.50	13.50	9.00
Miscellaneous			
Schonstedt GA-52 Magnetic Locator	5.00	3.00	2.00
M-2 Surveying Altimeter 0 to 10.000 ft. (2 ft. graduations)	8.00	4.80	3.20
Kern #173 Tripod with centering leg	2.00	1.20	.80
Wide Frame 5/8 × 11 or 3½ × 8 Tripod	1.00	.60	.40
Tribrach with optical plummet	2.00	1.20	.80
Tribrach prism adapter	.50	.30	.20
100 ft. add Chain and Reel	1.00	.60	.40
200 ft. add Chain and Reel	1.50	.90	.60
300 ft. add Chain and Reel	2.00	1.20	.80
Level Rods	1.00	.60	.40
Range Poles	1.00	.60	.40
Spectra Physics LT-3 transitlite w/fan beam attachment	20.00	12.00	8.00
Spectra Physics 611 Laser on a 20 second transit	15.00	9.00	6.00
Retro-Ray single prism assembly (round)	1.00	.60	.40
Retro-Ray triple prism assembly (round)	2.50	1.50	1.00
Retro-Ray tilting single prism assembly (lateral)	1.50	.90	.60
Retro-Ray tilting triple prism assembly (lateral)	3.50	2.10	1.40
Retro-Ray M-219 tilting mount for round single or triple	.50	.30	.20
Retro-Ray SMT-1 or YMT-1 tilting mount and target	1.00	.60	.40
AGA single prism in tilting holder and target	3.00	1.80	1.20
AGA triple prism in tilting holder and target	5.00	3.00	2.00
AGA prism in can only	1.00	.60	.40
AGA stake out prism with sight rod	1.50	.90	.60
AGA stake out prism	1.00	.60	.40

NOTE: For 30-day minimum contract rate, disregard "1-10 Days" column above.
New and used equipment available for purchase. Option to purchase information in rental agreement. Additional equipment available for rent or purchase - information on request. Authorized Lietz, Lufkin, Pentax, David White, Retro-Ray distributors. All short-range E.D.M. units are supplied with power supply, altimeter, thermometer and one single prism assembly.

Lessee pays all round trip shipping charges on rented equipment. Rental charges commence on the day the equipment leaves Lewis & Lewis and terminates on the day the equipment is returned or shipped for return to same Lewis & Lewis office from Lessee's location. Rates for longer periods available on request. Rates subject to change without notice.

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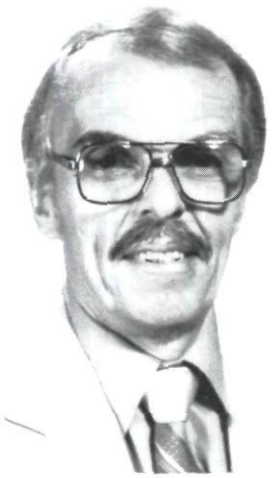
1/1/82

President's Message



The two most important challenges facing our association during the remainder of this year relative to the future of land surveying in this state are the continued liaison with the State Board of Registration for Professional Engineers relative to input and testimony on the Report of the Regulation of Land Surveying in California and the satisfactory conclusion of legislation relative to surveying by post 1982 civil engineers (Implementation of SB 2) by the joint CLSA-CCCE&LS "Blue Ribbon" Committee.

The above two activities have involved a great deal of time on the part of a number of extremely dedicated members of our Association in attending meetings, writing reports and personal contacts. I can't thank them enough for their generous participation.

Both of the above issues have and will continue to require the expenditure of funds by the Association. These funds are essentially derived from various sources of income, the major source of which is membership dues. In past years our members have been most responsive in paying their annual membership dues in a timely manner, however, this year, apparently because of the state of the economy, members are simply not as responsive.

In order for this association to effectively function, it takes a certain amount of operating capitol. I am asking all of you who have not paid their 1982 membership dues to please do so immediately so your association may continue with the important business. We need not only your active support but also your financial support.

For some time it has been my desire for CLSA to assist Dr. Fareed Nader, Coordinator of the Surveying and Mapping program at Fresno State by developing and teaching an in-depth boundary control course for his surveying program. Dr. Nader recently informed me James Matheny, Dean of the School of Engineering, has approved such a course to be taught during the Spring 1983 semester. It is my intention to have the course taught by various Surveyors throughout the state who would, as professionals, donate their time (one 3 hour class per week) with expenses for travel, meals and lodging paid for by the school. I will shortly be mailing a letter to our membership for volunteers. Providing such education by experienced professionals would be doing a great service for the profession.

In closing I would like you to reexamine your committment as a Land Surveyor to your Association. We will be facing a number of challenges and I ask all of you for your assistance and cooperation in meeting them head on.

Charles E. Moore, L.S.
President

Student Notes

by Craig A. Lee, President
Mary Niederberger, Vice-President
Rina Molari, Secretary-Treasurer
CLSA Student Chapter
California State
University, Fresno

At our annual spring picnic at Millerton Lake, elections for the Surveying Clubs at CSUF were held, and the officers were installed. The New Officers are: For the Surveying and Photogrammetry Association: Jay Goldfarb, President; Linda Bishop, Vice-President; and Todd Hesketh, Secretary-Treasurer. For the ACSM Club: Pete Gustafson, President; Stan Gray, Vice-President; and Gail Walters, Secretary-Treasurer. For the CLSA Club: Mary Niederberger, President; Paul Kittredge, Vice-President; and Dale Ayers, Secretary-Treasurer.

Nine CSUF students attended the CLSA conference held in San Diego in April. We would like to thank the different CLSA area chapters who were so generous with their support of us. This was an excellent chance for the students to become involved in the activities in the professional world. We hope to continue with this sort of interaction, for it is a valuable learning experience.

Our two visiting professors, Drs. Francis Fajemirokun and Kunwar Rampal, will be leaving at the end of this semester. We have enjoyed having them here and wish them the best. We welcome our new professor, Raidh Munjy, who is from Baghdad, Iraq. He will begin teaching in the fall.

We are grateful to Chuck Moore for his interest in the Surveying program here at CSUF. Hopefully, he and Dr. Fareed Nader can work out an arrangement so that CLSA can provide guest lecturers for our classes. The practical experience association in action correction greatly enrich our program.

If you have any questions, comments, or information in general, they can be directed to the CLSA Student Chapter, P.O. Box 482, Clovis, CA 93612

New Products

REBUILT EDM BATTERIES

Alexander Battery Company West, has introduced rebuilt battery components for most E.D.M.'s. Lewis J. Reguly, sales representative, indicates you can save about 50% in replacement costs.

Currently rebuilt batteries for most Hewlett-Packard: K&E's Vectron and Auto Ranger and the Leitz Red 1A are bing made available upon trade-in at the factory. Mr. Reguly has requested users of E.D.M.'s not mentioned, to write to him and make arrangements to send him a burned-out battery of varying E.D.M.'s so his technicians can determine if they can set up the machinery to rebuild them.

Mr. Reguly's mailing address is: 11450 Cabela Pl., San Diego, CA 92127.

Remember this is a NEW item to hit the markets and the development thus far has been on the E.D.M.'s widely used in California. Mr. Reguly is anxious to see what can be done with other E.D.M. equipment, but he feels it will be at least as cost effective as those already available. Alexander Battery Company West is just exploring the marketability of batteries for the Land Survey related products.

□

GEODIMETER 140 TOTAL STATION

The Geodimeter 140 incorporates several features which contribute to productivity in the field.

Through a unique totally electronic angle-measuring system which uses a signal collected as a mean value over the entire surface of a circle (thus compensating for any disc imperfections), full angle accuracy is obtained in a single face measurement. Complex microprocessor circuitry also senses and immediately compensates for deviations from plumb and for the instrument errors which will occur in conventional theodolites. Thus, there is no need for transiting the instrument.

The distance-measuring function of Geodimeter 140 has a 1.5-mile range to a single prism, wide beam for easy target location, instant horizontal distance readout, fast tracking mode and Unicom speech transmission via the measuring light beam to the reflector carrier.

Angle and distance information can be transferred to Geodat data recorder by pressing a single key. Additional data can be entered via the keyboard. Data memory capacity is 500 to 1,000 measured points; unlimited storage is available by transferring data to a solid state memory unit or tape cassette.

For more information, contact AGA Geodimeter, Inc., 385F Bel Marin Keys Blvd., Novato, CA 94947; 800-227-1756 (in Calif. 800-772-2664).

□

LIETZ CENTENNIAL BELT BUCKLE

In celebration of its 100th anniversary, The Lietz Company has commissioned one of the country's finest craftsmen to produce a commemorative belt buckle depicting a surveyor "on the job". Made of solid brass, this buckle is finely engraved, richly detailed and finished in burnished antique. It's a buckle you'll be proud to own and wear! For additional information, contact Kristy Lantz, The Lietz Company, 9111 Barton, Box 2934, Overland Park, KS 66201.

□

LIETZ RED-2 EDM, SF2 KEYBOARD

The Lietz Company has released a new EDM, the RED-2 which measures up to 6,000 ft. to a Lietz single prism and 8,500 ft. to a Lietz triple prism assembly in less than 6 seconds in the measuring mode and 0.5 seconds in the tracking mode. Accuracy is ±(5mm + 5ppm) m.s.e. at −20°C to +50°C. Automatic attenuation, self-checking microprocessor that monitors circuitry to assure correct display, built-in 11x coaxial telescope and variable tone pointing are standard features, the seven-digit alpha/numeric LED readout directly displays distances in feet or meters, and RED-2 attaches to any theodolite with either yoke or telescope mount adaptor. An insertable 6V NiCd battery pack gives 800 continuous measurements on a single charge. Slope reductions, Northings and Eastings and stake-out distances are obtained with the optional SF2 keyboard that attaches to the RED-2.

For additional information, contact K. Lantz, the Lietz Company, 9111 Barton, Box 2934, Overland Park, KS 66201. (913-492-4990)

□

GEODIMETER EXTENDS INSTRUMENT WARRANTY

AGA Geodimeter, Inc., now offers with its Geodimeter 110, 112, 116, 122 EDMs and Total Station 140 an optional Extended Warranty Service Agreement. By purchasing the Service Agreement with a new instrument, the owner can fix both his service costs and downtime for two years.

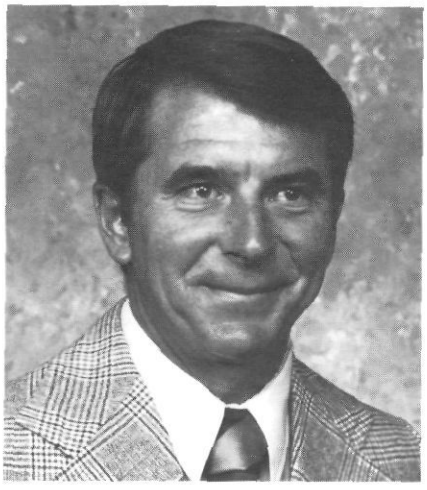
Under the contract, AGA Geodimeter agrees to provide a similar loaner instrument free of charge if shop time, or anticipated shop time, exceeds 48 hours. During the contract period, the instrument owner also is entitled to a free calibration, even if service is not otherwise required.

□

POSITION WANTED

Map Drafting—Topo, Subdivision, Parcel, etc. I have 5+ years experience in drafting, and 2+ years surveying experience, LSIT #2085. Reasonable rates, by the hour or by the piece. Call eves./wknds. (415) 653-6286.

Equipment Corner



ABOUT THE AUTHOR:
Mr. Smith is a Licensed Land Surveyor with 14 years experience in the profession. He is 37 years old, holds a bachelor's degree from California State University, Los Angeles in Business Administration, and operates his own surveying firm in Bakersfield. He is a member of both C.L.S.A. and A.C.S.M.

by Reily Smith

The results of the Spring EDM poll are shown at right. The number of responses was disappointing and it would be hard to condemn a particular EDM when only one surveyor had bad luck -unless it was yours!

With modern theodolites and EDM's, hand-held radios are essential when making long shots. Let's conduct the next poll on hand-held radios. I have used several brands of FM radios and CB's and found that they all leave something to be desired. The itinerant frequency of 151.625 MHz sold in the FM's is almost as crowded in the Bakersfield area as the CB frequencies. It seems strange that, in this modern electronic age, there isn't a radio that is rugged and inexpensive with an honest two mile range. Every survey firm I know has a box full of radios that are not worth fixing. How do you feel?

There were a number of comments in the response cards that were not mentioned in the poll results because of space considera tions and some thoughts of my own I would like to share:

1. Why doesn't the EDM industry use the same prism constant with all of their retro-prisms?
2. After spending hours converting inches in architect and mechanical engineers plans to decimal feet, I almost wish we would go metric—just to have one common unit of measurement.
3. Have you ever tried to screw a prism directly to a tripod for a distance shot, only to find that the thread beginning in the prism case is so deep it won't work?
4. The POB manufacturers survey on transits and theodolites was good. All they need to do is include the warranty and trial test periods allowed for purchasers.
5. Why can't they make a good rod bubble that never needs to be adjusted?
6. The last two Linker rods I purchased have not worked right. Is it my usual bad luck; or, is their quality slipping?
7. One respondent to the EDM survey wrote that if a good field man had been allowed to make suggestions, all categories could have been 10's! This might apply to all of our equipment.
8. If anyone has used a "Tesco Tower," would you let us know how you liked it?
9. Some of you may have missed getting on the mailing list of "Professional Surveyor." Their mailing address is: P.O. Box 246, Falls Church, VA 20046. It is a "freebie" magazine with some good articles.

EDM SURVEY RESULTS

MAKE	MODEL	1*	2	3	4	5	6	7**	COMMENTS
HEWLETT PACKARD	3800	7.1	9.1	9.1	9.0	6.5	8.5	6	Old-Good One. Size & weight inconvenient. In six years it has never failed and only been in the shop once
HEWLETT PACKARD	3805	6.0	9.5	9.0	9.5	8.5	8.0	2	Accuracy and dependability are greatest assets for less expensive machine
HEWLETT PACKARD	3810	9.2	7.3	9.1	7.3	6.1	8.6	6	Heavy and bulky. Angular error will not approach 1/5000. Constant error in slope distances beyond 17°. Poor optics. Factory service is expensive and slow, but good
HEWLETT PACKARD	3820	10.0	7.0	8.0	10.0	7.0	8.0	1	Rather large investment costs for small companies
TOPCON	GTS-1 GUPPY	9.3	8.7	8.7	9.7	9.0	8.7	3	Two machines have not required service in two years. Convenient. Accuracy could be better, but consistent traveres of ½0000 to ⅛000
TOPCON	DMC 2	8.1	9.7	7.2	9.7	9.6	9.0	4	Unfailing performance. No problems. If a good field man had been allowed to make suggestions, both (DMC-2 & GTS2) could have 10's all the way.
TOPCON	DMS-1	9.0	9.5	9.0	10.0	10.0	9.5	2	Had one year and it is great, does good job. Saves many hours and is dependable.
TOPCON	DMS-2	8.0	9.0	10.0	8.0	N/S	9.0	1	Has performed well. Only one minor problem with battery cable.
TOPCON	DMC-3	9.0	10.0	9.0	10.0	N/S	9.0	1	This is probably (still) the most cost effective medium (short) range EDM on the market, it's great.
LEITZ	RED I-A	9.3	9.5	9.0	9.5	9.5	9.5	4	Good, simple and reliable. Performs beyond specifications with speed and accuracy
KERN	DM 501	9.0	10.0	8.0	10.0	9.0	9.0	1	
KERN	DM 502	10.0	10.0	5.0	10.0	8.0	10.0	1	Never sent an update manual as promised. Readout in meters only.
AGA	12&112	10.0	10.0	8.0	10.0	10.0	10.0	1	Have geodimeters for many years and am very happy with them
AGA	14A	8.0	10.0	9.0	10.0	10.0	9.0	1	Model mounts on theodolite—requires alignment adjustment about every two weeks, which takes ½ to ¾ hour.
K & E	VECTRON	1.0	1.0	1.0	1.0	1.0	1.0	1	K & E should be encouraged to recall this instrument with full refund. This is a "bust".
K & E	S MODEL (2 Miles)	10.0	10.0	10.0	10.0	10.0	10.0	1	Daily service for 3 years without a day's downtime
McHENRY	MAC I H	9.0	9.0	9.0	8.0	9.0		1	Has been a good dependable investment.
ALPHA	HAWKEYE 2000 M	5.0	2.0	2.0	5.0	5.0	0.0	1	Poor instruction manual. Had to be sent to factory 3 times the first year after it stopped working in field.

* Means average of following categories. 10 is highest rating.
1. Ease of operation (speed, convenience, simplicity)
2. Dependability
3. Complete and understandable intruction manual
4. Performance as advertised or represented
5. Quality of factory/dealer service after sale
6. Overall rating (would you recommend it to a friend)

**Number of responses
N/S - No service required to date

Horizons

L.I.M.S. 1982

by E. Keith Klagge, L.S.

A paper on the recent successful efforts of industry to provide high precision inertial survey technology to the County of San Diego for utilization in their Land Related Information Management System (L.I.M.S.) Project.

Since 1970, the County of San Diego has been considering the development of an automated, land-related Data Base Management System. The purpose of the L.I.M.S. Project is to centralize all data concerning land parcels within a geographic area for use by the public and private sectors. Currently, this information is fragmented throughout the county and other governmental jurisdictions. The benefits derived from this system would include: the elimination of duplicative efforts by the various governmental agencies in acquiring and documenting land-related data; considerably faster processing and retrieval of information; data that can be related accurately to geographical locations; computer aided mapping; and significant cost savings to government. The county estimates that seven to nine million dollars are spent each year by the many governmental jurisdictions and utility companies in San Diego County to update mapping and land-related information. The amount spent by the private sector to retrieve, assimilate and utilize this same information, although unknown, is considered to be significant.

In 1978, under the direction of Mr. Rudy Massman, Director of Public Works, the County of San Diego established the L.I.M.S. task force, and assigned Mr. Kenneth L. Pyle as Project Director. The task force was directed to conduct a study including: analysis of existing land-related data base systems, particularly from the failure standpoint; a user-oriented needs analysis; a generalized systems architecture design; an operational scope of work; and an estimated costs analysis. The study indicated that previous systems had failed primarily due to their inability to directly relate processed (land) information to accurate physical (ground) locations, and not an inability to provide adequate computer architecture. The end result was the preparation, by the task force in December 1981, of a two-part Request for Proposal (RFP #1, RFP #2) to private industry to develop a system based upon a densified land survey net. This survey was to be conducted so as to provide horizontal accuracy standards per the National Geodetic Survey (NGS) Second Order, Class II specifications on all section corners, quarter-section corners and other major controlling property corners. This would integrate the L.I.M.S. data base into the California State Plane Coordinate System (Zone 6) and greatly facilitate the County's effort to require all future surveys to be tied to the L.I.M.S. data base monuments. Utilizing this framework for the land net, data base monumentation would exist at an approximate spacing of one-half mile, allowing for fast, low-cost tie-in and simplified subsequent entry of data into the system.

In 1979, as a function of their study, the L.I.M.S. task force gained the approval of the County Board of Supervisors to submit an R.F.P. to land surveying firms in Southern California to provide a twenty square mile "pilot" survey with which to assess the feasibility of using a high-precision (NGS, Second Order, Class II) survey-based system. The site chosen for the "pilot" survey was an area near the city of Del Mar, containing a mix of urban and rural development, river and oceanfront land, an interstate highway right-of-way, and significant vertical relief.

In April of 1980, under the direction of Mr. Louis R. Hall, County Surveyor, the County awarded the contract for the "pilot" survey of the Del Mar project to the firm of Klagge-Stevens and Associates, Inc., a consulting civil engineering, land surveying and land planning organization, headquartered in El Cajon, California. Since the early 1970's, Klagge-Stevens has specialized in providing civil engineering and land surveying expertise to architects, private developers and governmental agencies in California, Nevada and Florida in conjunction with residential, commerical, industrial, institutional and public works projects.

Mr. E. Keith Klagge, Executive Vice-President and Chief Executive Officer of the corporation, assumed the position of Project Director of the Del Mar Project. Mr. Klagge is a registered land surveyor in the states of California, Nevada and Alaska. He is an active member of the American Congress on Surveying and Mapping, the Nevada Association of Land Surveyors, the California Council of Civil Engineers and Land Surveyors and the California Land Surveyors Association.

Mr. Michael L. Stevens, President and Professional Services Manager for the Corporation, directed efforts to provide the project with computer-aided documentation including a seventeen sheet Record of Survey Map. Mr. Stevens is a registered civil engineer in the state of California and Nevada and has an extensive background in computer technology and programming. He is an active member of the American Society of Civil Engineers, the American Public Works Association, the Society of American Military Engineers, the California Council of Civil Engineers and Land Surveyors, and the California Land Surveyors Association.

Klagge-Stevens and Associates, Inc. completed the Del Mar Project, including the preparation of all final documentation, in four months time, utilizing the latest methods and technologies of conventional surveying. With the realization that inertial survey technology was on the horizon, special techniques were employed using a jet helicopter for corner recovery, reconnaissance and control survey procedures, to provide data to assist in the evaluation of the county-wide L.I.M.S. project. Much of the criteria found in the current two-part RFP was provided by the Del Mar Project.

In the past three years, Klagge-Stevens and Associates, Inc. has invested a great deal of capital and personnel resources in researching improved methodology and new technology, which will enable high-precision, high-density surveys to be performed on large-scale densification projects at considerably reduced costs. To effect measurable reductions in cost, it was determined that the tasks must be accomplished with significant reductions in both time and manpower requirements. Our research led us to the aerospace industry and the investigation of inertial navigation systems, being used in recent years for lower-accuracy, low-density positioning surveys. Three systems were available; none of which could provide the accuracy required by the San Diego County Project. However, one of the companies, Honeywell, was pursuing the feasibility of engineering and manufacturing an inertial survey system capable of providing greater accuracy for higher density survey projects. Their Avionics Division, located in Clearwater, Florida was under contract to build and test an inertial positioning system (GEO-SPIN™) to provide a horizontal position accuracy of plus or minus one meter. Through initial contact with Mr. Michael J. Hadfield, Honeywell Senior Staff Engineer, Klagge-Stevens and Associates, Inc. was invited to Clearwater to discuss the possibility of producing a GEO-SPIN™ system capable of meeting high accuracy specifications. Through continued liaison with Klagge-Stevens; Dr. Maurice K. Kurtz (Associate Professor of Civil Engineering at the Florida Institute of Technology); Mr. Duane Brown (Geodetic Services, Inc.); Messrs. John Wickham, Geoffery Chapman and Philip King (World Surveys, Inc.); Honeywell produced improvements which they felt would allow the system to provide increased accuracies.

In October, 1981, a Joint Venture was formed in order to provide the complete expertise and resource capital required by the L.I.M.S. RFP #1. A complete proposal response was submitted to the county with: TYMSHARE, Inc., a computer data base management firm headquartered in San Francisco, providing the venture capital and computer architecture expertise; Klagge-Stevens, providing the complete land survey expertise; and World Surveys, Inc., an inertial survey firm based in Cape Canaveral, Florida, providing the equipment, management and operation of the inertial survey system(s). This Joint Venture has been selected as one of four ventures being considered to provide the county of San Diego with the necessary expertise to develop a comprehensive L.I.M.S. system (RFP #2).

With the deadline of the RFP #2 approaching, Klagge-Stevens coordinated with World Surveys and Honeywell to perform a test using the Honeywell GEO-SPIN™ system to determine whether or not that system was, in fact, capable of achieving high-precision accuracies. To enable an accurate and meaningful test to be performed, a precisely-controlled, conventionally-surved course needed to be monumented and documented for data comparison. Test criteria was determined using the San Diego county L.I.M.S. project parameters as a goal. With the assistance of Mr. Walt Moyer, Chief Surveyor for General Development Corporation, a large engineering and development company in the Southeast, a test site was provided in Port Malabar, Florida. This area was chosen primarily for its proximity to World Surveys and Honeywell for facile access in continued testing of future systems. The site also provided excellent conditions for testing the inertial system in either a land vehicle or helicopter configuration.

In January 1982, the test course was monumented by Klagge-Stevens and Associates, Inc., with seventy-one control points in a one and one-half mile by two and one-half mile grid, with an approximate spacing between points of one-quarter mile. The grid network was tied on opposite sides to three First Order (NGS) control stations. Horizontal control was established using (as a minimum criteria) the NGS Second Order, Class II specifications, and all vertical control was accomplished by three-wire differential leveling using balanced sights of approximately four hundred feet. All adjusted data, together with criteria used, is shown on the attached eleven-page survey control summary document.

In February, 1982, the Honeywell GEO-SPIN™ IPS-2 system was transported to the Port Malabar site for testing. People from many parts of the county, representing a variety of interests, came to observe the test. Honey-

well's technical personnel operated the system for the duration of the test, following a carefully designed plan, previously determined to provide pertinent data to all involved. The final results indicated the system had, in fact, provided the accuracies desired, thus opening the way for inertial-survey system use on the San Diego County project and other projects previously not considered.

The significance of the success of this test is immediately visible to the San Diego County L.I.M.S. Project in two major areas. First, and most important, is the ability with inertial surveying to provide a cost savings of several million dollars over conventional survey methods. Second, with the use of an inertial survey system, the total time required to completely survey and document this project can be reduced by approximately 50% over conventional survey methods. By shortening the time required to provide the County with an operational system, cost savings begin much earlier. Realizing that San Diego County covers approximately 4,300 square miles and contains in excess of a half-million individual land parcels, the importance of time and cost benefits are magnified.

The success of this test may provide the beginning of a new era in cadastral and densification surveying. Many areas of the country are watching San Diego County, such that a successful L.I.M.S. project should prove the catalyst for many other automated, survey-based systems. □

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Perspectives

QUOTATIONS FROM THE PAST AND THOUGHTS FOR THE PRESENT

by Michael R. McGee, L.S.

One of the greatest challenges facing surveyors today, is to retrace the foot steps of those surveyors who preceeded us. To accomplish this, one must be more than diligent, one must almost be psychic. One should endeavor to put himself in the frame of mind of those original surveyors. To see the world as they saw it, the value of land, the hardships they endured, and the knowledge and professional exchange that was available to them.

These men who preceeded us were generally men of integrity and not at all unlike ourselves. We should not be too quick to criticize their methods and procedures for were we in their shoes, and knew what they knew, we would probably have made the same decisions.

There are a few books written on the subject of land surveying around the turn of the century, one of which I have found most interesting as related to our present day practice. Studying some of these older books is enlightening in that it helps one to follow in the foot steps of our predecessors.

One book well worth sharing was written by A.C. Mulford titled *Boundaries and Landmarks, A Practical Manual.* What's important to note is that this book was written in 1912 over 70 years ago. If you have had occasion to read this book I'm sure you'll agree that many of Mulford's quotations bear repeating.

In his chapter on the duties of the surveyor, Mulford states, "We have today fully entered upon an era of high land values, the high prices paid by the wealthy for lands from which to form estates have revolutionized the methods of handling realty. The title of all property must be absolutely quaranteed and payment is usually made by the acre. As a result, heavy demands are made upon the surveyor who finds himself confronted by two necessities, first the necessity of making an extremely accurate set of measurements and secondly the necessity of defining clearly the boundaries of the land which he must measure, and the latter is by far the harder task. These problems he must work out single handed and with the fear of failure shadowing him day by day and hour by hour."

It would appear from his statements that although the times change and the dollar is inflated a thousand fold, in the minds of men all things remain relative.

In his chapter on description of property he states, "The fundamental description of property however, is to be regarded as the deed and it is necessary first to consider the nature and intention of this instrument in order to understand why it is so often disappointing and deficient from the surveyors point of view."

"A deed is essentially a lawyers, not a surveyors document, its intention is to make the possession of a certain piece of land sure to the owner forever, not to give a minute description of the land for the comfort of the surveyor."

Later in the same chapter in addressing the procedure that a surveyor should follow in locating descriptions he discusses the aspects of doing a fence line survey or in his terms, "as occupied or as found in possession survey." He goes on to say that "The other method, which is generally adopted as the correct one is to endeavor to determine the boundaries of the land as originally intended to be conveyed."

This is not easily done today nor was it then, as he states in reference to a given description, "The courses in the above description are given only to a quarter of a degree which allows and practically necessitates an error of some minutes in the bearing of every course in the description. In the second place the original survey was probably run with an old fashioned surveyors compass, which is a crude instrument at best."

Regarding the duties of the surveyor he states, "In the vast majority of the cases the actual measuring of land forms the smaller portion of the duties, his hardest work is often, to use a colloquial phrase, to find the land to be surveyed."

In his chapter on the work and training of the surveyor he closes with, "When it comes down to a question of the stability of property and the peace of the community it is far more important to have a somewhat faulty measurement of the spot where the line truly exists than it is to have an extremely accurate measurement of the place where the line does not exist at all."

In his chapter, Responsibilities of the Surveyor, he states, "It is needless to say that the successful surveyor must be accurate in his instrument work and his computations yet if he were to really succeed he must go beyond this, he must add to this the patience to collect all the evidence which can be found bearing upon the case in hand together with the ability to weigh this evidence to a nicety and to determine clearly the course pointed out by the balance of probability. If in addition he possesses enough imagination to cast pleasant lights across the desert of dry details he should be successful indeed. The watchwords of surveyors are patience, and common sense."

He makes several good points in these chapters none of which have changed in 70 years. It is not sufficient to be trained in the ability to measure angles and distances to be a surveyor, although there are some who would think that Surveying 1A in their freshman year of college is all there is to know about surveying. He makes a second point that bears repeating, "It is far more important to have a somewhat faulty measurement of the spot where the line truly exists, than it is to have an extremely accurate measurement of the place where the line does not exist at all."

An over simplified example of this could be a situation where a

deed begins at a section corner and runs north along the section line 500 feet to the south line of John Doe, the surveyor measures out to first order traverse standards setting the point of beginning precisely at 500 feet. However, if inspection of John Doe's deed indicates his property is 510 feet north of the section corner, then that surveyor is in the wrong place. His measurements are precise but his solution is inaccurate.

One second theodolites, electronic distance measuring devices and computers will not make up for poor judgment or a lack of diligence on the part of the surveyor.

In this case a proper solution using a stadia rod would have been closer to where the line *truly exists.*

To reiterate, it is not enough for the surveyor to be able to measure the land but more so he must be experienced and educated in the art of the profession, of the alternatives and approaches to a boundary problem the easier ones are probably not the right ones.

In his book, Mulford also addresses the relationship of the surveyor to our closest professions the attorney and the engineer.

He states, "It is a curious fact that a great many lawyers who are continually dealing with land transfers are grossly ignorant of the simplest details of surveying -I should say that the minority know the number of feet in a chain.

As a result, many useful details which the surveyor, could gladly furnish in connection with a piece of land in question, are to many of them difficult of comprehension or absolutely meaningless. On the other hand the surveyor is probably equally ignorant of the law of property. A frank recognition by each, of his own limitations, is I think the first step to a sound understanding and furnishes a starting point from which both may work together toward accurate and satisfactory results."

With regard to the engineer, Mulford states, "The vocation of the civil engineer has always been invested with a dignity of its own but it seems to be that of late years in paying him the honor which is his just due we are apt to fix a little too wide of a gap between him and his humble brother the surveyor. We give engineering the chief attention in our technical schools but surveying we are wont to relegate to the freshman class, yet the profession of surveyor deals with one of the oldest and most fundamental facts of human society - the possession and inheritance of the land. Fire, flood and earthquake wipe out the greatest works of the engineer but the land continuouth forever."

It would seem from reading Mulford's book that he was a very modern and progressive surveyor, or perhaps things have not changed at all in 70 years.

In closing, I will leave you with one final quotation which sums up many of my feelings on the profession of land surveying.

He states, "Curiously enough the surveyor is isolated in his calling and therein lie his responsibility and temptations. The lawyer comes nearest to understanding the work, yet of the actual details of the survey most lawyers are woefully ignorant, the business man who can judge to a hair the fulfillment of contract, has no eye for the shortened line or the shifted land mark, to the skilled accountant of the bank the traverse sheet is a closed book. Dishonesty in ordinary business life cannot be long hidden and errors in accounts quickly come to light, but the faults or faulty survey may pass unchallenged through the years, for few but the surveyor himself are qualified to judge it. I maintain that in the hands of the surveyor to an exceptional degree, lie the honor of the generations past and the welfare of the generations to come, in his keeping is the doomsday book of his community, and who shall know if he is false to his trust? Therefore I believe that to every surveyor who values his honor and has a full sense of his duty the fear of error is a perpetual shadow that darkens the sunlight.

"Yet, it seems to me that to a man of active mind and high ideals the professional, singularly suited for the reasonable certainty of a modest income, must be added the intellectual satisfaction of problems solved, a sense of knowledge and power increasing with the years, the respect of the community, the consciousness of responsibility met and work well done. It is a profession for men who believe that a man is measured by his work, not by his purse and to such I commend it."

Your Association in Action

by James R. Dorsey, L.S. Secretary

On August 7, 1982, the Board of Directors of the California Land Surveyors Association held their second quarter Board Meeting.

Some of the items discussed at the Board Meeting were:

A report that S.B. 1693 was suspended. This is the bill that would give surveying a separate authority to the Civil Engeineers Act and a CE exam in lieu of the L.S. exam to practice boundary surveying.

The Board of Registration for Professional Engineers is looking at Sunset Legislation and is asking a lot of questions as to why surveying, with the exception of boundaries, should be regulated.

It is pointed out that a surveyor is the sum of all of the elements that make up surveying. This includes topo, levels, quantities, geodetic as well as boundaries. The thought is offered that to deregulate the expertise required to perform such functions would create a hardship and a burden to the public.

One analogy is to not regulate dams or bridges because they make use of the survey data that is not regulated in their design and construction. So where is the responsibility if a bridge fails due to poor survey data used in its design. Perhaps with the Civil

Engineer who hired the surveyor. But then what recourse does the Civil Engineer have if surveying is not regulated and a surveyor has put his business on the line if he makes such a mistake.

Another important item discussed is your Association's operating budget. It is over extended.

This is the result of a deficit in the conference. By spending way beyond the budget in liaison with the Board of Registration as we go through hearings about deregulation and by a joint committee, with CCCE & LS and your Association to work out a means of implementing S.B. 2.

In addition, membership is down. This combines for about $10,000.00 deficit.

We ask you to support your Association. We can not continue to be responsive to the survey community without your support. If you are not a member of CLSA, join now. If you want to make a donation and not be involved, do it now. You may make the difference.

Since the Board of Directors Meeting, the joint committee met and reached what we all believe to be a good sound solution to the implementation of S.B. 2.

What is proposed:

Post 82 civils can perform all surveying except boundaries. They can not sign a map or condo plan. They can offer to perform as long as they hire someone authorized to perform surveying to do the actual work.

A post 82 Civil can practice boundary surveying only after passing the second half of the L.S. Exam and obtaining an L.S. License.

A land surveyor can offer to perform civil engineering work as long as the person doing the actual work is licensed or registered.

The person doing the actual work, whether he be engineer or surveyor, may be contract help. He does not need to be an officer of the firm.

A Land Surveyor can sit for the CE exam based on his L.S. License.

Both the Civil wanting to take the L.S. exam and the L.S. wanting to take the Civil exam must show two years of experience since the E.I.T. or L.S.I.T.

It is the recommendation of your association that this proposal be supported by the surveying community.

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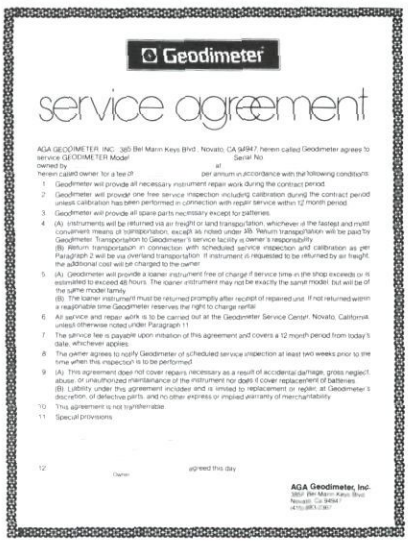

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6. All service and repair work is to be carried out at the Geodimeter Service Center, Novato, California, unless otherwise noted under Paragraph 11.
7. The service fee is payable upon initiation of this agreement and covers a 12 month period from today's date, whichever applies.
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News Briefs

IN MEMORIAM

We were saddened to learn that Bob Leger, L.S. 3166, passed away March 28 after a short illness, in Tuscon, Arizona, at the age of 52. Bob practiced in Santa Maria for a number of years before his retirement a couple of years ago. He was Chapter Representative for the Central Coast Chapter, and active in several CLSA committees. Bob is survived by his wife, Phyllis of Yuma, son Steve, daughters Jan and Lindi, two grandchildren, and a sister, Deani Stillers.

Professionalism

DUTIES OF AN EXPERT WITNESS

by Clyde F. Anderson

When an architect or engineer is sued by his client on a claim that he has been negligent in the design of a structure, the client should have a heavy burden to carry on his way to the architect's or engineer's pocketbook. This burden, imposed by the law, is a burden of proof and it should be a formidable enough burden to cause the client to pause and reflect before starting his suit against his designer. Unfortunately for the architectural and engineering professions, the thoughtless eagerness of some of their number is easing the burden of the client and transferring it onto the backs of their fellow professionals. Let me explain.

The law defining an architect's or engineer's obligation to his client is stated generally in the language employed by the Federal Court in Minnesota in the case of *Peerless Ins. Co. v. Cerny & Associates, Inc.*, 199 F. Supp. 1951:

> It is the law of Minnesota that ordinarily the standards of reasonable care, which apply to the conduct of architects are the same as those applying to lawyers, doctors, engineers and like professional men engaged in furnishing skilled services for compensation, and they are entitled to adequate protection and a wide discretion in determining what practices and principles are best suited for the work undertaken by them. In the instant case they would be required to perform said services for which they were engaged, in good faith with reasonable care and competence, and would be liable for damages occasioned by any failure to do so.

Or, as the New York Court put it in the case of *Major v. Leary*, 268 N.Y.S. 413:

> The law does not expect or require absolute perfection, but tests the efficiency of the architect by the rule of ordinary and reasonable skill usually exercised by one of that profession.

From these and numerous other cases that could be cited, it can be seen that the law recognized that in the design professions we are dealing with subjects where there is no one "right" or "wrong" answer but rather we are dealing with opinions and judgments of designers as to what may be the better answer for his client's problem under the particular circumstances presently confronting him. In doing this, the architect or engineer is entitled to "adequate protection and wide discretion" and is to be tested "by the rule of ordinary and reasonable skill usually exercised" by his profession. (From cases cited above.)

From my experience with architects and engineers I find that in many areas of design the practice among qualified and reputable men varies so broadly that it is difficult, if not impossible, to say what the "ordinary and reasonable skill" standard may be. Beyond that, if such a standard of conduct could be defined within rather broad lines by a rather extensive survey of an architectural and engineering community, it would be most unlikely that any individual architect or engineer would be aware of that standard in the absence of such a survey because ordinarily he is so busily engaged in tending to his clients' business within the confines of his own office.

Remember, the client has the burden of proving the standard of professional care as well as the defendant architect's or engineer's failure to measure up to that standard.

A great disservice is done the architectural and engineering professions when an individual architect or engineer undertakes to advise a non-client owner or attorney as to the boundary limits of acceptable or reasonable design standards of his profession unless he is *sure* that he is well acquainted with the relevant practices employed by a broad range of his fellow professionals. If he has such a broad knowledge of the design practices followed by other competent professionals in the specific area under question, and I suspect there are a few that have, then he must be very careful to discover and examine all of the facts and circumstances that were weighed by the designer in question before he can fairly render an opinion that such designer has failed to measure up to professional standards. For every architect or engineer who is critical of his brother professional in a discussion with a friendly non-client owner or his attorney at a golf club or bar must certainly expect to be called into court later, by subpoena if necessary, to restate those opinions and subject himself to stiff cross-examination.

A story may bring my thoughts previously expressed into focus. Several years ago I defended a doctor in an eye surgery malpractice case. It was the claim that he had used an unacceptable technique and this had produced a bad result. There was no question but that the patient had a bad result. We were defending the doctor on the theory that he had used an acceptable technique and had obtained an unfortunate result. Three doctors separately came into court, and each in turn criticized my client's employed technique and stated it was not good practice in the medical community each claimed that there was only one surgical technique that was acceptable by contemporary medical community standards and

that was the technique that he employed. The interesting point of the case is that on cross-examination it was shown that the individual technique that was used by each of the three was DIFFERENT. The defendant doctor received a favorable verdict.

You see, each of the three thought he was aware of the boundary limits of acceptable professional standards. In fact he was not. The consequences: (1) each was unjustly critical of his brother professional; (2) the profession suffered bad publicity; (3) great expense was unnecessarily incurred by the defendant doctor as well as his insurer. Perhaps worst of all, what posture will any of the three be in in the future if they should have the great misfortune of having a bad result in a particular case? It would seem that the patient has a ready-made list of committed experts available to testify in his behalf (the other two from the former case who said their way was the only acceptable way).

The outcome of a recent bodily injury suit against an architectural firm should bring the lesson closer to home.

The architects had designed a school addition in 1959, and six years after the new wing was completed, a six-year-old girl received severe cuts on the face and neck when she fell through a plate glass door in that section of the school. In addition to the physical pain of her injury, the child had suffered psychologically from the scars. All other defendants were let out of the parents' suit, and the trial centered around the propriety of the architects specifying plate glass for the doors.

The plaintiffs brought forward two formidable witnesses. One was a local glass supplier who demonstrated the differences between breaking ¼" polished plate glass, which shattered in jagged spikes, the tempered glass, which broke apart in small kernels and required a good deal more pressure to break.

The second witness was a highly-acclaimed architect. The architect cited twenty years of experience in the profession and confidently testified as to standards of practice in that region. He stated that, since 1950, the school board of a nearby major city required safety glass in all of its school structures. He also stressed the advantages of tempered glass, which is five times harder to break and, when broken, does not result in jagged edges.

As is true so many times, the best defense potential lies in the fact that the plaintiff's witnesses are eager to expound to their captive audience on how much better they could have designed the project. Consequently, they frequently over-reach and exaggerate.

On cross-examination, the defense was able to turn the tide of evidence. Examination of the architect's credentials revealed that only half of the expert's twenty years of experience had been in that region, and his capacity to define regional standards therefore appeared doubtful.

The architect was also forced to admit that there are disadvantages to using tempered glass, among them that it can be unbreakable to the point that serious concussion rather than cut can occure. In addition, tempered glass is difficult to replace because it cannot be cut after it has been tempered; it must be special ordered to size from the factory. It is also much more expensive than polished plate glass, and the plaintiff's expert had not even considered that, as is often the case, the school board had a very tight budget.

The defense then obtained testimony from the director of school construction in the city requiring safety glass in its schools. The requirement had not been put into force until 1961, two years after the architect designed the school addition in question.

Two employees of the largest wholesale glass firms in the region testified. Their companies together handled 60-70% of the glass business in the state and based on their experience with architects' plans and specifications submitted for bids, they testified that 90 to 95% of the plans and specifications for the year the addition was designed had called for the use of quarter-inch plate glass. They testified that, at the time of trial, over fifty percent of the architects outside the metropolitan area which required safety glass were still specifying polished plate glass in public school buildings.

Another architect of high reputation was called as a defense witness. His testimony made a pleasant contrast to the eager denunciation by the plaintiff's expert. This architect admitted that, although he had been in practice for about thirty years, he was unable to speak for any other architectural office as to the standard that existed in specifying glass for an entranceway. He brought his own firm's records for the period of time in question and revealed that all of the ten schools and church buildings designed during that time period specified quarter-inch plate glass.

Finally, the defense was able to counter the original expert's testimony that one major design firm set the standards for the area. This firm had designed another addition to the school where the accident occurred and had also specified polished plate glass for an enormous window near a wooden door. After that, it didn't take the jury long to find in favor of the defendant architects.

The points to be remembered from these cases are:

1. Do not become a self-proclaimed authority on the standards of practice in your community unless you, in fact, know the standards of conduct of other design firms in your area, or you may find yourself committed to a position which is not the standard.
2. As an expert witness, it is not your duty to testify as to how much better you could have done the job. You are obliged only to express your opinion on the adequacy of the original design to perform as intended.
3. Testimony should be tempered by the original budgetary and other limits on the project; obviously a designer given free rein with regard to design and cost will not be hampered by the same problems as a designer who must meet a preconceived plan and tight budgetary restrictions in his project.

This is not to suggest that design professionals maintain a "conspiracy of silence" when requested to serve as expert witnesses. However, expert testimony should be carefully tempered to give an unbiased evaluation of the profession's standards

rather than the expert's own inclinations.

BIOGRAPHICAL SKETCH OF CLYDE F. ANDERSON

Partner in the law firm of Meagher, Geer, Markham & Anderson, 400 Second Avenue South, 7th Floor, Minneapolis, Minnesota;

Engaged in the practice of law in Minneapolis for twenty-five years specializing in trial practice and defense of professionals;

Received Bachelor of Science in Laws degree from University of Minnesota in 1944;

Received Juris Doctor degree from University of Minnesota in 1946;

Member of Hennepin County, Minnesota State and American Bar Associations;

Past Chairman State Bar, Court Rules Committee;

Present vice president, Minnesota Defense Lawyers Association;

Member of International Association of Insurance Counsel;

Member of Federation of Insurance Counsel;

Fellow of International Society of Barristers;

Lecturer at University of Minnesota Continuing Legal Education seminars.

From the Editor

FINANCES

The last edition of *The California Surveyor* was the first to be printed by the firm which CLSA selected to use on a trial basis in an attempt to cut operating costs. Previous editions had been costing the Association over $1500; the Spring Edition resulted in an INCOME of $65 to CLSA. This is welcome news, as we can certainly use the savings for other programs. Your comments on the quality of the magazine are still welcome and will be used by the Board of Directors to evaluate the new printer's performance.

ARTICLES

In March of this year CLSA President Chuck Moore assigned various chapters the responsibility for providing articles for specific editions of *The California Surveyor*. Of the six Chapters assigned to provide articles for this edition, only the Humboldt Chapter actually came through (Michael Mc Gee's article printed in the Perspectives section). Plaudits and thanks!! (and a Bronx Cheer for you other Chapters).

The following Chapters have been assigned to provide articles for the NEXT edition (deadline is November 15):

Los Angeles / Ventura
Marin
Monterey Bay
Mother Lode
Northern California
Orange County

NEW EDITOR

This edition of *The California Surveyor* is my last. I have thoroughly enjoyed putting the magazine together, but more than this have enjoyed the company of the hardworking, dedicated people who spend their own time to make CLSA work for all of us. I know that they, and you the reader, will give the new editor the same support and encouragement that I enjoyed.

I hope you got as much out of reading this rag as I got out of editing it; if so, my time and yours has been well spent.

R.E. Baldwin Editor

□

Conference

The 1982 C.L.S.A. Conference held in San Diego this past April proved to be a fairly relaxed affair as Conferences go. Attendance was down compared to past conferences, primarily due to economic conditions, but the smaller numbers seemed to make for a more congenial, easy-going atmosphere.

A.C.S.M. President Ira Alexander and N.S.P.S. President Don Bender officially opened the Conference, and discussed the variety of activities their organizations are involved in at the national level, and the problems that they foresee in the future. Of particular importance is the fact that they have formed a Political Action Committee. Michael Schulman, Public Member of the Board of Registration, then spoke on new developments in the State Regulation of Land Surveyors.

The technical sessions were informative and diverse, covering such topics as computer graphics, understanding your client, the effects of the Economic Recovery Act of 1981, rattlesnakes, mechanics leins, and professional liability among others. Social activites included a 10 km run, golf and tennis tournaments, a dinner dance, and an evening in Mexico.

A highlight of the Conference was a presentation by Board of Registraion Land Surveyors Committee members Juanita Hall-Cobb (Public Member), Roy Nakadegawa (C.E. Member), and Fred Seiji (L.S. Member). The discussion shed a great deal of light on the functioning of the Board, but more important revealed the Board Members to be not only accessible but genuinely desirous of an ongoing exchange of ideas and concerns.

Some twenty-two exhibitors also came to San Diego, bringing the latest in field and office equipment and plenty of expertise on how to get the most out of it. Also well represented at this conference was computer and calculator software for surveyors.

Thanks to all those who helped to make this Conference a success - the exhibitors, the speakers, the Conference Committee, and all of those who attended.

Letters

Editor: Mr. Dunbar's letter (Cal. Surveyor No. 68, pg. 11-Ed) deserves some comment. Although his letter appears to address a simple problem in simple terms, he addresses a far more serious problem which deserves more comment.

What should be shown on a record of survey? On the one extreme, we could show all positions reduced to the surface of some specific mathematical spheroid model. On the other extreme, we could show the name of the person actually making the measurement, the serial number and model type of the instrument used and the raw data (no mathematically doctored data like horizontal distances). Between these two extremes are an infinite number of choices of which we have now a working operational choice. We show the results of the reductions of those raw measurements fit into a mathematically perfect model so that each position represents the most likely position based on the raw measurements obtained.

Power calculators have made possible better raw data to best estimate of position conversions. If the raw data is carelessly obtained, the best estimate of position won't be very good. On the other hand, if the raw data *is* carelessly obtained, he is in violation of the Land Surveyor's Act.

When the surveyor signs the Record of Survey, he certifies that the data was not carelessly obtained, that every reasonable effort has been made to use the data to make a best estimate of each position on the map.

It is my opinion that, that is why it requires a license to sign the Record of Survey. If only the raw data were listed, then it would take a license to *READ* a Record of Survey.

by: Joseph H. Bell
Survey Engineer II

□

Editor: I am making a collection of excerpts from original field notes or very old surveys which portray some of the frustrations, interests and humor of the early surveyors.

U.S. Deputy Surveyor Sherman Day writes:

"On Saturday morning, 18th June [1851], on my way out from camp I accidentally left my note book on an oat hill that was on fire and walked a mile or two before I missed it. On returning I found only its ashes. I had lost the notes of all the 12 miles of zigzag line through Townships 1 & 2 S, R2E, (Mt. Diablo Meridian) the notes of the random line, and 2 miles of the true southern boundary."

Although I can't imagine "walking" away from a wild grass fire, I *can* imagine why he laid his notebook down. I do know the ground he had covered, and the loss of those notes was a genuine tragedy. Stories like this provide an insight into surveying that would, I believe, interest even the layman, and I hope to publish a collection of them. I would include the names of any of your readers who make contributions.

Kenneth G. Lamb, L.S.

Editor's Note: Readers wishing to contact Mr. Lamb may do so at 426 El Caminito, Livermore, California 94550

□

Editor: The Land Surveyor licensing examination given last October represents a failure on the part of the California Land Surveyors Association and the Board of Professional Engineers in the performance of an important public trust. The 1981 test has been widely perceived as being very 'one-sided'; it contained no questions relating to most areas of knowledge generally considered to fall within the responsibility and purview of the licensed land surveyor. Following is a list of major subject areas which have traditionally been well represented on the L.S. tests and the corresponding point value in the 1981 exam.

Subject	Possible Points on the 191 Exam
Astronomy	0
California Coordinates	0
Triangulation	0
EDM	0
Adjustments (statistical)	0
Construction Surveying	0
Earth Work	0
Photogrammetry	20
Boundary Resolution and Recordation	110

Surveyors must, of course, know the law relating to boundary resolution. However, they have always been expected to be expert in making and evaluating measurements. This expertise requires, for example, a familiarity with mathematics at a fairly theoretical level; in particular, it requires a knowledge of statistics. While much routine mathematics is facilitated by hand-held calculating devices, problems concerning the statistical compilation and adjustment of survey measurements involve subtle matters of reasoning and judgment.

The public needs to be sure that someone licensed as a Land Surveyor by the State of California has sufficient mathematical expertise to conduct his land surveying business in a professional manner. However, now it seems that this is not being tested for in the licensing procedure. (The LSIT is not a necessary requirement for an LS, and besides, only tests for more rudimentary mathematical ability.)

Upon inquiry, I have discovered that the testing committee of the California Land Surveyors Association had some organizational difficulties last year and formulated the 1981 test at the last minute, in some extreme haste. Consequently I was informed that is is understandable that the test would be less than adequate.

Perhaps the California Land Surveyors Association isn't sufficiently organized to act in a liaison role with State government. In this particular case, the CLSA has certainly not lived up to a significant public trust: that of insuring the validity of the State Licensing process.

I suggest that the State of California more closely monitor the test making procedure within the California Land Surveyors Association.

Lewis Soloff □

AND

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TENACITY and VERACITY

Being a Surveyor's Discourse on Privation and Deprivation
by Kenneth G. Lamb, L.S.

INTRODUCTION

You may be surprised to know Surveyors do tell tales,
Which job was hottest, which most cold, who climbed the steepest trails,
Of set-ups where the Transitman was hanging by his nails.

CANTO THE FIRST

"I was working the Sierra—there was nothing to be found,
Until an eagle high above me made his raucous sound,
And looking up I saw a blaze one-chain above the ground.

It seemed the guy that marked the line was working in the snow,
He thought those trees were all young growth, and how was he to know,
That sixty feet of mighty trunk was hangin' down below?

Well, back we went that winter and finished up with ease,
We set the pipes right in the snow and then we let them freeze,
It thawed—they fell and set themselves as pretty as you please."

CANTO THE SECOND

"I guess that's how it happened 'cause I know you wouldn't lie,
But I was near the border once when it was late July,
The heat waves was so thick you couldn't even see the sky.

The corner post had sweated down into a one-inch stake,
A rod-long buzztail blocked my way and *give his tail a shake,*
So I grabbed those dawgone heatwaves and shoved 'em at that snake.

He opened up and swallered them and rared up with a start,
Just lookin' at those one-link fangs it almost stopped my heart,
But then them heatwaves took aholt and shook him plumb apart."

CANTO THE THIRD

"New England fields hatch granite stones like Leghorns laying eggs,
You never want to jar the ground by driving pipes or pegs,
A ten-link boulder might jump out and break the tripod legs.

Well, Yankee ingenuity has worked this out just fine,
Each Spring they haul those stones away to mark the Boundary line,
Stone fences marking off the ground are better than a sign.

Of course there are some problems that you'd have no way of knowing,
Each year the stones keep popping up—the farmers keep on going,
Those famed New England mountains why, they're
just stone fences growing."

CANTO THE FOURTH

"I did my turn near Cody before I got too old,
And if you've been around awhile I'm sure you have been told,
That in the Northern Rockies it gets a little cold.

One time, when starting out a job we first unrolled the chain,
And used it like a yardstick—I don't mean to complain,
But we had to wait until late June to roll it up again.

When we set out one Winter day to measure out a section,
We wrote the notes out carefully, then made our temp correction,
And found we had been going in the opposite direction."

CANTO THE FIFTH

"Out near Four Corners country I was working with my pards,
On ground so steep we chained a mile to make a hundred yards,
And finding us a better route just wasn't in the cards.

We came to this here mile-high butte so close to zero bevel,
That even getting up the thing would be the very devil.
We flipped the whole job on its side and chained it on the level.

We smugged at one another, slapped each other on the back,
But when we started out again I had a heart attack,
We'd picked a clockwise mesa and we couldn't turn it back."

CANTO THE SIXTH

"The trees are fairly sizeable below Columbia Rim,
Why, fifteen rods is common just to reach the lowest limb,
And survey crews wear miners' lamps, the forest is so dim.

So when a big one falls on line and it is tall and wide,
We mark a horizontal curve by methods true and tried,
In ten to fifteen stations we have reached the other side.

One of the Bearing Trees was marked when it was very small,
And as that little sapling grew into a giant tall,
The scribing grew along with it to letters twelve-links tall."

MORAL

I'm not a criticizer—I don't want to seem uncouth,
But I checked out all these stories that were told me in my youth,
And I discovered one of them appears to stretch the truth.

Still, here's to one Old Timer to whom I tip my hat,
He pointed out my fancy gear's not really where it's at,
"Unless you find the corners, who cares the closure's flat?"

I'm glad to say I had my day with transit and with chain,
And chopping line to move ahead across the rough terrain,
That's not to say about that day I'd want it back again.

News from the Board of Registration

Jim Dowden

The Professional Engineers Board is very pleased to announce that on July 19, 1982, Mr. James Dowden will have joined the Board staff as a Program Manager for land surveyor exam preparation and administration activities.

Jim brings to the Board coniderable expertise in land surveying matters; expertise gained through his many years of service to the State Lands Commission and his very active involvement with professional organizations.

Among Jim's duties, as staff to the Board, will be application review, providing assistance to enforcement staff, preparation of portions of the Board newsletter, staff to the Board Land Surveying Commmittee and liaison with professional societies.

TIDELANDS INVENTORY REPORT

Review of article "Tidelands Inventory Report" from California Landworld, *Vol. 3, No. 5, March 1982, contributed by Leroy Weed, L.S.*

Copies of the State Lands Commission Tidelands Inventory Report are available (at cost) from the State Lands Commission, 1807 13th Street, Sacramento, CA 95814. Costs of the report are as follows:

a. Main Report, 985 pp	$25
b. Appendix (by coastal County - specify)	$2.50 ea.
c. Offshore Islands	$2.50
d. Complete set of the above	$65

The report is the result of five years work by the Tidelands Inventory Unit and is the first phase of a program set up by Chapter 706, Statutes of 1975, that will eventually result in firm boundaries for coastal tidelands. An interesting aspect of the program is that the bill requires the State Lands Commission to fix boundaries in areas of naturally fluctuating shoreline and the Commission staff is now mapping and describing the tideland boundaries as fixed lines. The report covers only the coastal portion of the State, and does not cover inland waters.

To preview the report prior to ordering, check your local library since copies have been sent to all "Complete Depository Libraries". □

CADASTRAL SURVEYS

Submitted by Clifford A. Robinson, Chief, Branch of Cadastral Survey, California B.L.M.

This is to inform you of official cadastral surveys in California which have been accepted in the third quarter of FY-82 (April 1 -June 30). These surveys are now on file in the Survey Records Office, Bureau of Land Management, California State Office, 2800 Cottage Way, Sacramento, California 95825.

The accepted surveys are listed below by township, range, meridian, and acceptance date.

Township & Range	Meridian	Date Accepted
T. 10 N., R. 9 W.	Mt. Diablo	05-03-82
T. 47 N., R. 8 W.	Mt. Diablo	05-05-82
T. 2 S., R. 17 E.	Mt. Diablo	05-05-82
T. 19 N., R. 5 E.	Mt. Diablo	05-07-82
T. 24 N., R. 3 E.	Mt. Diablo	05-12-82
T. 7 S., R. 9 E.	San Bernardino	05-17-82
T. 32 N., R. 9 W.	Mt. Diablo	05-17-82
T. 37 N., R. 9 W.	Mt. Diablo	05-18-82
T. 11 N., R. 32 W.	San Bernardino	05-28-82
T. 48 N., R. 3 E.	Mt. Diablo	06-01-82
T. 20 N., R. 4 E.	Mt. Diablo	06-11-82
T. 4 N., R. 18 E.	Mt. Diablo	06-16-82
T. 34 N., R. 11 W.	Mt. Diablo	06-17-82
T. 25 S., R. 38 E.	Mt. Diablo	06-22-82
T. 29 S., R. 41 E.	Mt. Diablo	06-28-82
T. 30 S., R. 42 E.	Mt. Diablo	06-28-82
T. 4 S., R. 27 E.	Mt. Diablo	06-30-82
T. 33 N., R. 9 W.	Mt. Diablo	06-30-82

Supplemental plats in the following townships were also accepted during the third quarter:

T. 16 N., R. 2 E.	Humboldt	05-04-82
T. 26 N., R. 16 E.	Mt. Diablo	05-18-82
T. 5 S., R. 3 E.	San Bernardino	06-25-82

□

NSPS NOTICE OF AWARDS

The National Society of Professional Surveyors is sponsoring four awards to be given for excellence in the surveying profession this year. The awards are:

1. SURVEYING EXCELLENCE AWARD

Chairman: M. Louis Shafer
520 Loretto Drive
Roseville, CA 95678

This award is presented to a person who has performed outstanding service to the surveying profession. It is not necessary that the person be a surveyor or member of NSPS or ACSM, but candidates must be nominated for the award by an ACSM affiliate section or two NSPS members at large. This award includes an engraved plaque and a $500 honorarium contributed by Technical Advisors, Inc., Wayne, Michigan.

2. SURVEYOR PROJECT OF THE YEAR AWARD

Chairman: Ms. Kelly Olin
3526 "M" Street
Sacramento, CA 95816

This award is presented to the best paper describing a surveying project in which the candidate directed or participated. The project need not have occurred within the preceding 12 months to be eligible. This award includes an engraved plaque and a $200 honorarium from NSPS.

3. STUDENT PROJECT OF THE YEAR AWARD

Chairman: David R. Knowles
2448 Elaine
Fayetteville, AR 72701

This award is presented to the student who writes the best paper describing a survey related project in which the student was a participant. The writing of the paper must be an individual effort. Any undergraduate student enrolled in

a surveying or surveying related program is eligible for this award. The award includes an engraved plaque, a $100 honorarium contributed by Landmark Enterprises, and travel expenses to the ACSM / ASP spring meeting.

4. EXCELLENCE IN PROFESSIONAL JOURNALISM

Chairman: R.B. Buckner
1958 Neil Avenue
Ohio State University
Dept. of Geodetic Science
Columbus, Ohio 43210

This award is presented annually to the affiliate society whose newsletter is judged to have the highest quality during the previous year. The award is an engraved plaque and is presented to the editor of the newsletter at the awards ceremonies during the annual convention.

Questions pertaining to or requests for the guidelines of any of the four NSPS awards should be addressed to the Chairman of the award.

SURVEYING REGULATION IN CALIFORNIA
Preliminary Findings August 18, 1982

A surveying task review of: Land Surveyors, Civil Engineers, Photogrammetric Surveyors, Consulting Engineers in Photogrammetry.

The preminary report dated August 18, 1982 and printed below is the result of a series of public hearings and input to the Board of Registration over the past several months by the Board Liaison Committee of CLSA.

All Land Surveyors are urged to fully read and understand the implications to Land Surveying in California contained in Item 4 (A) to (F).

Your reactions to this report should be directed to Vince Sincek, L.S. Chairman, Board Liaison Committee of CLSA, with copies to Association Headquarters.

PRELIMINARY SUMMARY OF FINDINGS

• It is estimated that 1300 to 1400 land surveyors, 4000 to 5000 civil engineers and 500 dual licensees currently practice surveying in California (either part time or full time). (Comments received indicate the number of civils doing some surveying may be as low as 1750.)

• During the 21 month period between June 5, 1980 and March 31, 1982 the Board received 238 complaints of probable violation of the Land Surveyors' Act. Of the 238, 130 (55%) were received from the public, 61 (26%) from the profession and the remaining 47 (19%) from other agencies or internal operations.

• Of the 238 field investigated land surveying complaints filed with the Board, the breakdowns by major category are:

1. Unlicensed Practice	29%
2. Contractural - Land Surveyors	15%
3. Incompetence - Land Surveyors	12%
4. Contractural - Civil Engineers	11%
5. Incompetence - Civil Engineers	10%
6. Fraud - Deceit - Land Surveyors	10%
7. Fraud - Deceit - Civil Engineers	7%
8. Other	6%
Total	100%

Additional Preliminary Findings, Based on Information Received Through August 1, 1982 and Response to Questions in Introduction of Report

1. *Were there failures of the regulatory process prior to SB-2?*

A. A review of surveying complaints received by the Board over the past 2 years does not show any substantial difference between complaints against civil engineers and complaints against land surveyors.

B. These complaint statistics show possible problems with both civil engineers and land surveyors in contract preparation and in making consumers aware of the total cost involved.

C. Although surveying encompasses activities other than boundary determination, almost all of the complaints of incompetence relate to boundaries.

D. Almost one-third of the complaints are of unlicensed practice. Much of this problem appears to be as a result of confusion in the definition of surveying. Certain tasks are not clearly defined in the Acts.

E. A review of complaints supports that many boundary problems could be avoided if some means of arbitration could be developed. Many complaints develop because two professionals cannot agree on the best survey solution, causing a consumer to seek Board assistance.

2. *Are Civils qualified by education, experience and testing to do all or only a limited activity in surveying?*

Unless complaint statistics are made available showing a problem, the Board should assume that engineering provisions requiring persons to "work only in their area of competence" is an adequate consumer safeguard.

Any change restricting surveying to a smaller group of professionals will likely raise the cost of services to consumers.

Pre-SB-2 arguments stressed an educational problem in that colleges and universities no longer teach surveying to civils. Complaint statistics do not support any particular problem with newly registered civils. Statistics, in fact, show there may be more of a problem with pre-1970 civils and land surveyors pointing out a need for re-education.

3. *Are the limitations of SB-2 in the best public interest?*

The Engineers' and Land Surveyors' Acts as currently written are confusing to the public, the applicant and the practitioner. Post-1982 civils are unsure of their legal right to practice aspects of civil engineering and the Board's ability to enforce statutory provisions of law is increasingly restricted because many enforcement actions require a legal interpretation before staff can answer questions of legitimacy.

Tasks restricted to civils and to land surveyors should be clearly defined in the appropriate section of each Act.

4. *Should the Board propose statutory change to the Engineers' and/or Land Surveyors' Act?*

The final staff recommendation on this matter will be delayed until the September Board meeting because staff expects additional information to be provided from several societies.

As a guide to the type of recommendation expected based on facts received to date, staff in-

cludes the following:
A. Place a direct definition of restricted tasks for civils in the Engineers' Act and for Land Surveyors in the Land Surveyors' Act. Do not retain current cross-over provisions where civil provisions are referenced in the Land Surveyors' Act.

B. Since boundary (property) determinations apear to be the only real consumer complaint problem, restrict the right to establish or re-establish boundaries, corners or monuments between lands not held in common ownership to persons passing the land surveyor exam.
C. Since boundary determinations are the major problem area for registrants, place a minimum experience requirement for all land surveyor applicants dealing with field and/or office boundary determination work.
D. Add problems for testing applicants in contracts to the land surveyor examination.
E. Eliminate the January 1, 1982 provisions modifying activities of civil engineers.
F. Allow pre-January 1, 1983 civils and land surveyors to retain all previous rights, but require additional training and/or testing in boundary laws and contracts. All land surveyors and civils wanting to practice land surveying be completed within (2) years after this statutory revision takes place.

Upon completion of this training/testing qualifying civils may be issued, by the Board, a land surveyor license. The training to be approved by the Board. □

Advertisers' Index

Sustaining Members

SUSTAINING MEMBERS (Continued)

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