

SURVEYOR

HOOSIER

**Indiana Society of Professional
Land Surveyors, Inc.**

TRI-STATE IN '78



VOLUME 4
NUMBER 4
FALL 1977



ISPLS CHAPTER ACTIVITY REPORTS • COSA DELEGATE RE-
PORT FROM LITTLE ROCK • TRI-STATE CONVENTION IN
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COVER: The 1978 Annual Convention of the Indiana Society of Professional Land Surveyors will be a Tri-State affair with Ohio and Kentucky just south of Cincinnati on February 16-18, 1978. An outstanding program is planned. This will be the second out-of-state meeting - the first one was with Illinois in 1974 at Champaign.

EDITOR'S NOTE:
Deadlines for copy for various planned issues of the HOOSIER SURVEYOR are as follows:
Winter issue - January 31
Spring issue - April 30
Summer issue - July 31
Fall issue - October 31
The HOOSIER SURVEYOR is reproduced by the Printing Department of Marbaugh Engineering Supply Co., Inc., Indianapolis, Indiana.

The Hoosier Surveyor is published quarterly by the Indiana Society of Professional Land Surveyors, to inform land surveyors and related professions, government officials, educational institutions, libraries, contractors, suppliers, and associated businesses and industries about land surveying affairs.

Editorial/Advertising offices: 3919 Meadows Drive, Suite 103, Indianapolis, IN 46205 (Telephone: 317/545-8907). Advertising rates, closing dates, circulation data on request. Contributed articles, photographs subject to space limitations.

Kenneth S. Curtis
Editor

THE PRESIDENT'S PAGE

PRESIDENT'S MESSAGE

By John V. Schneider

The 1978 Tri-State Convention is still some distance in the future. By the same token, this issue of the Hoosier Surveyor will be the last before this meeting, and my last opportunity to urge your attendance. Income from the convention will be shared by the three State Societies based on the respective attendants, and because of the geographical location, Indiana will be at somewhat of a disadvantage. This income is obviously important to the Society, but I would like to appeal to your sense of pride in urging your participation. Due to the quality of the program, participation by national exhibitors, and sheer size, the convention is likely to attract national attention. Lets make plans now and show those who have an eye on this convention that the surveyors of Indiana possess a sense of pride and professionalism second to none.

Luther Condre and his Legislative Committee have been busy over the last two months laying their ground work for the 1978 Legislative Session. Numerous State Representatives and Senators on both sides of the political fence have been contacted and many a sympathetic ear has been lent to our causes. While the battle is still very much up hill, considerable progress is being made.

Although much remains to be done before the new officers and directors take over for 1978, I did want to pass on my thanks on behalf of the Society to all those who assisted in the management of ISPLS this past year. The contributions, while they may seem small on an individual basis, when placed into the overall picture make it possible for our Society to function without professional assistance. Don't underestimate the value of your assistance, I'm just glad we didn't have to do without it.



John Schneider
President



TRI-STATE LAND SURVEYORS' CONVENTION
INDIANA, OHIO, AND KENTUCKY
FEBRUARY 16-18, 1978
DRAWBRIDGE MOTOR INN
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DATES TO REMEMBER

February 16—18, 1978	Tri-State Land Surveyors' Convention Drawbridge Motor Inn, Ft. Mitchell, Kentucky (Ohio—Indiana—Kentucky)
February 23—25, 1978	Illinois IRLSA Annual Conference, Clock Tower Inn, Rockford Illinois
February 24—25, 1978	Tennessee TAPS Convention, Airport Hilton, Nashville, Tennessee
February 27—March 3, 1978	Annual Convention of American Congress on Surveying and Mapping, Washington, D.C.
October 16—20, 1978	Fall Convention of American Congress on Surveying and Mapping, Albuquerque, New Mexico

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COSA DELEGATE REPORT 1977 ACSM FALL CONFERENCE LITTLE ROCK, ARKANSAS

by
Byron M. Brady
1977 COSA Delegate from ISPLS

The ACSM Council of Sections and Affiliates (COSA) met Wednesday, October 19, in conjunction with the 1976 ACSM fall conference.

1. National Surveying Teachers Conference. At the 1976 ACSM fall conference in Seattle, Washington, COSA adopted a resolution supporting this ninth triennial conference. Each state society was urged to budget \$100.00 per year to support this and subsequent conferences. It was announced that to date \$1900.00 has been received and that Indiana was a contributor.

2. Annual LSD Surveying Excellence Award. Letter was read from Don Wilson, Chairman 1977 Surveying Excellence Award Committee, urging those persons submitting nominations for the award to follow instructions explicitly to assure that their time and effort will not be wasted.

3. Accreditation Guidelines for Surveying Programs. Much discussion took place concerning this item, with our own John McEntyre contributing valuable input regarding the procedures he was currently involved with.

4. A member of the New York State Board of Registration for Engineers and Land Surveyors requested that COSA recommend to the Board of Directors of LSD that a committee be formed whose sole function would be to prepare guidelines for incompetency and negligence. He also asked that we request our individual state boards to send him questions for possible inclusion in a national examination.

5. Don Bender of the California Society gave an indepth presentation of the information his committee has gleaned relative to the job classifications as set out in the government job description texts, in particular the Dept. of Labor's Dictionary of Occupational Titles. It would appear that there is much work to be done before "Surveyor" will be listed as a separate job classification instead of as a technician sub-category under Civil Engineer.

6. As a result of the California Societies' disenchantment with ACSM due to its lack of lobbying and legislative efforts on behalf of the surveyor, a resolution was submitted by R. Harris, Florida, B. Rathbun, Minnesota, and E. Griffin, California, stating the following:

"Be it resolved by the Land Surveys Division of ACSM that the ACSM Board of Direction instruct its staff to develop, immediately implement and properly fund a program to provide a level of representation equivalent to that of other related professional organizations in the specific areas of legislation and agency liaison."

7. It was pointed out by the delegate from West Virginia that the "Surface Mining Control and Reclamation Act of 1977" (Public Law 95-87) was passed with the terms registered professional engineer or professional geologist with no mention of registered land surveyor. This becomes a Catch 22 situation in that by some state laws a land surveyor must perform the required surveys. A resolution was passed urging the LSD Board of Direction to push for an ammendment to reword the act adding "registered or licensed land surveyor: thereby making it compatible with state statutes.

8. It was announced by Don Schultz, an ISPLS member from Cincinnati, that the recommended revised set of by-laws for the Land Surveys Division had been approved at the Tuesday, October 18 meeting of the Board of Direction of LSD. One of the changes will eliminate COSA making the March 1978 meeting its last. In the future the state delegates will be delegates directly to the Land Surveys Division.

The meeting that I have attempted to outline above was a 3½ hour session, and my first to attend. Neil Franklin, whose term I am completing, was there to fill in the gaps for me and without his help I would have been hopelessly confused. Thanks again, Neil, and I hope to have a better handle on things before the March, 1978 meeting.

ISPLS CHAPTER ACTIVITIES

TECUMSEH CHAPTER (centered at Lafayette)

The 1977 officers of the Chapter are:

Chairman: Paul Coutts

Vice-chairman: Robert L. Martin

Secretary-Treasurer: Patrick N. Cunningham

The chapter has taken on the task of educating the Tippecanoe Area Plan Commission in the areas of responsibilities and liabilities of the Professional Land Surveyor and the problems that a surveyor is faced with in the design of a subdivision. The chapter's goal is to enable the local surveyor and the area plan commission to better work together to provide better planned development to the public.

Unfortunately, there has not been a lot of activity to report for the Tecumseh Chapter for 1977. With the increase in demand for surveying in the past year, it has been difficult for the local practitioners to spend the time necessary with the local chapter to keep it as active as it should be. Hope to see this change as winter comes upon us.

ST. JOSEPH VALLEY CHAPTER (centered at South Bend and Elkhart)

The 1977 officers of the Chapter are:

President: Byron Brady

Vice President: Bob Richardson

Secretary-Treasurer: John McNamara

Meetings are held the last Thursday of the months of January, March, May, July, September and November. There are 21 dues paying members and usually about 12 to 14 members attend each meeting. There will be an election of officers at the January meeting. Past presidents include Ray Pharis, Larry Vanosdol, and John McNamara.

The NGS has established an EDM test range in St. Joseph County at our request and the chapter is presently working on the establishment of standard length monuments in the floor of the County-City Building lobby in South Bend.

Through the new subdivision ordinance in St. Joseph County, the County Surveyor is distributing to all practicing surveyors a reduced 1/2 size copy of every recorded plat since January, 1977.

NORTHWEST INDIANA CHAPTER (composed of the following counties: Lake, Porter, LaPorte, Newton, Jasper, and Starke)

The 1977 officers of the Chapter are:

President: William Andrews

President-Elect: Ray Tappan

Secretary-Treasurer: Richard Buckingham

Directors: Emil Beeg, Charles Hendricks, James Keil, and Ed Carnes

This active chapter meets no less than four times a year. Among subjects included in past meetings are the following: a) Monumentation standardization; b) The acceptance of mortgage loan inspection certificates and plats by banks and other lending agencies; c) The feasibility of establishing a central repository in each county for the filing of all survey plats made in that county.

In October a joint meeting was held with the Dunes Chapter of I.S.P.E. Approximately 40 engineers and land surveyors enjoyed a demonstration of the HP 97 by Charles Campbell.

NORTHEAST INDIANA CHAPTER (centered at Fort Wayne)

The 1977 officers of the Chapter are:

President: William Davis

Vice-President: Jerry Walker

Secretary-Treasurer: Joseph Stooddy

The Chapter usually has four general membership meetings per year. During 1977 the Chapter held two general membership meetings and two fair-weather social events consisting of Golf and Cook-Out.

Membership meeting discussions revolved about the following topics: problem surveys and/or unusual survey situations; recent experiences using the Judicial System for collection of past due accounts; County Surveyor's position on Section Corner relocation and perpetuation; and fee charges for various types of surveys.

Active committees for 1977 included Section Corner Restoration chaired by Joseph Stooddy, and Survey Fee Charges chaired by John Donovan. Election of officer for 1978 will be held in December.

INDIANAPOLIS SURVEYORS PLEASE NOTE!

A recent news release should be of interest to central Indiana land surveyors. Indianapolis is probably the largest metropolitan area in the United States without adequate geodetic control stations.

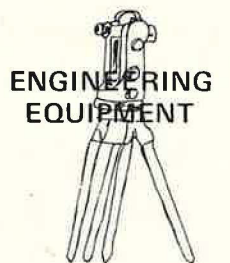
A recently completed survey of the City of Chicago, a co-operative project conducted by a survey party from the National Geodetic Survey, will provide the framework for a computer mapping program being developed by the city. The survey established 150 new survey markers throughout the city and will enable private surveyors to determine land boundaries more accurately and quickly. Specifications for the primary work, in which over 130 portable Bilby towers were erected, required an accuracy of one part in 100,000."

THIRTY ATTEND ISPLS FALL WORKSHOP IN INDIANAPOLIS

Chuck Budnick, chairman of the Workshops Committee, reports that approximately thirty firm principals attended and participated in the one day workshop on "BENCH MARKS TO BETTER MANAGEMENT" which was conducted on November 11th at I.U.P.U.I. in Indianapolis.

The instructor was Mr. Robert Hanes who is the Dale Carnegie Consultant in Central Indiana and presented a very interesting and informative program covering such topics as client relations, employee motivation, and attracting and selecting employees.

Chuck feels like all learned how important human relations are to their businesses. He also thinks there was a large enough interest in this topic to generate some future workshops.

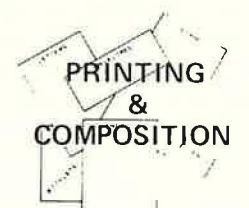
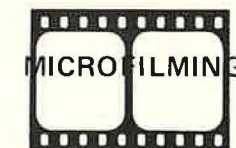
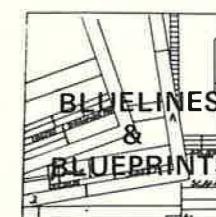


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INDIANA—OHIO—KENTUCKY

Thursday through Saturday, February 16–18, 1978

Drawbridge Motor Inn and Convention Center
Interstate 75 and Buttermilk Pike
Fort Mitchell, Kentucky 41017
(southern Cincinnati suburb)

First-ever-joint meeting of Indiana, Ohio, & Kentucky surveyors

The Convention Committee have sent out program schedules, convention registration forms, and room reservation forms to each member of the concerned state societies. Additional forms and information can be obtained by addressing

Tri-State in '78 Convention
c/o Indiana Society of Professional Land Surveyors
3919 Meadows Drive, Suite 103
Indianapolis, Indiana 46205
Phone: 317/545-8907

PROGRAM HIGHLIGHTS

Four concurrent workshop sessions will be held on Thursday afternoon, Friday morning, and Saturday morning and will feature "business", "personal development", "professional", and "technical". Two field trips are scheduled for Thursday morning. A general session on Friday afternoon will be followed by the annual meetings of each state society from 3–5 P.M. Check the final program for names of the participants in each session. Many outstanding speakers and topics including ACSM President Ellsworth V. Stanley of Rhode Island. An expanded number of exhibitors is anticipated and will be open from noon Thursday to 3 P.M. Friday.

SOCIAL EVENTS

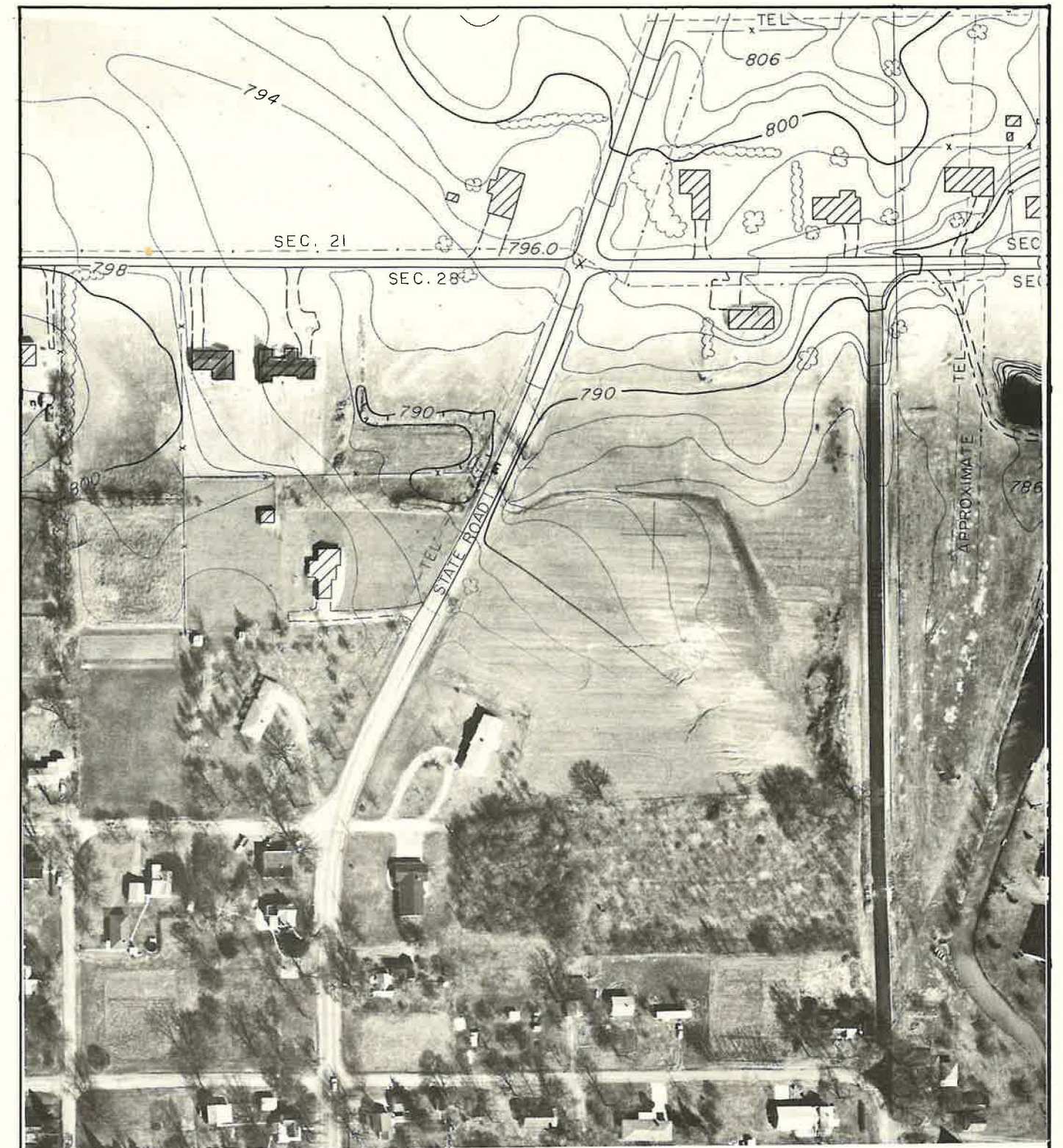
Besides the usual buffet breakfasts and luncheons, two outstanding evening dinners are planned:

Thursday evening—Bavarian Night at the Drawbridge. Special Buffet Dinner with favors, entertainment imported from the "olde country" and dancing.

Friday evening—Cocktail Party at the indoor pool area. Banquet and Entertainment.

LADIES PROGRAM

A complete ladies program is planned. On Thursday a luncheon at Riverview Room, Quality Inn Riverview (revolving restaurant) followed by an afternoon of shopping at Florence Mall. On Friday, breakfast and fashion show at Shillito's followed by sightseeing and shopping in downtown Cincinnati. Also Friday afternoon a "stretch and sew" fashion show and dry flower arrangement demonstration. On Saturday morning, a breakfast and slide program "Out in Peggy's Garden". And don't forget the two evening dinners as a part of the program.



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THE LATEST ON COMPETITIVE BIDDING,

ETHICS, AND ADVERTISING

EDITOR'S NOTE: The October 1977 issue of the Professional Engineer, the monthly publication of the National Society of Professional Engineers contains the following information on legal actions involving competitive bidding, ethics, and advertising.

Ohio—The state attorney general has filed a suit against the Ohio Society of Professional Engineers (OSPE) and an affiliated group of consulting engineers in the state, alleging that the OSPE ethical provisions against competitive bidding and the OSPE Manual of Practice (including fee data) violate the federal antitrust laws. The possibility of such a suit under the state antitrust law had been known for some months, but the suit surprisingly was filed under the federal law. Prior to the filing of the suit, OSPE had withdrawn the competitive bidding ethics rule and the fee information in the state Manual of Practice pending the outcome of the NSPE case.

ASCE—The Federal District Court in New York ruled in August that the American Society of Civil Engineers (ASCE) was in contempt of court by violating its 1972 consent decree when it suspended two members for violating the ethical rule against supplanting in 1975. In reaching this decision Federal Judge Cannella did not pass on the legality of the supplanting rule itself but held that the grounds for the suspensions were that the members had submitted price quotations for an overseas project while another firm was negotiating with the client for the same work. The court rejected ASCE's defense that the 1972 consent decree was not meant to prohibit the submission of price quotations if done at a time when such activity would violate the supplanting provisions of the code of ethics. But Judge Cannella said the consent decree enjoined ASCE from prohibiting the submission of price quotations for engineering services at any time.

The decision specifically rejected the Department of Justice request for complete elimination of the supplanting rule. Judge Cannella termed such relief "unwarranted." In the particular case, he said, there was "merely a single instance in which Article 3 (supplanting rule) was applied in violation of the consent decree. There is no reason to believe that it has been or will be used to thwart the purposes of the consent decree. "However, he did direct ASCE to refrain from enforcing the supplanting rule "in a manner which inhibits the submission of price quotations for engineering services."

AIA—The supplanting rule has come under legal attack from another direction—this time a private suit by a member of the American Institute of Architects (AIA) who was suspended for taking over a project from another architect in violation of the supplanting rule. According to available information on the suit, the suspended architect was awarded a contract for a visitors center in Washington by a federal agency for which he had worked up until approximately two weeks before the award. The architect who had previously held the contract for the same project alleged violation of the supplanting rule. If the case reaches a formal decision it could have an im-

portant bearing on the legality of the supplanting rule stated in several professional society codes.

Advertising of professional services—Since the Supreme Court decision in the Arizona lawyer advertising case (PE, August 1977) the New York Regents, which control all of the state professional licensing bodies, adopted a new comprehensive rule on advertising of professional services. Under the New York approach, the first state authority to act, professionals may now advertise short of false, fraudulent, deceptive, misleading, sensational, or flamboyant statements and may not use testimonials or guarantee any service or make claims of professional superiority. The New York rule also permits advertising of fixed prices or a stated range of prices for specified routine professional services, provided the advertisement clearly states whether additional charges may be incurred for related services which may be required.

The American Bar Association (ABA) in an annual meeting in August promptly revised its advertising bans in line with the Supreme Court decision, now allowing lawyers to advertise firm name, phone numbers, whether credit cards are accepted, office hours, biographical information, fields of practice, hourly rates, and range of fees for standardized services. The new ABA provision permits radio, but not television, advertising. The ABA action is only a guide for state bars and is not binding on ABA members. Even so, Justice Department lawyers at the ABA meeting stated that the new rule does not go far enough to satisfy the Antitrust Division views and that more lawsuits can be expected. The Antitrust Division suit against ABA, filed before the Supreme Court decision allowing "truthful" advertising for "routine" legal services, still stands despite the ABA action to amend its code in line with the Supreme Court decision.

COURTROOM TECHNIQUES FOR THE SURVEYOR

By: *Honorable John Fenton, Associate Justice, Massachusetts Land Court*

Editor's Comment: The following article is the transcript of a speech delivered by Justice Fenton to the Massachusetts Association of Land Surveyors and Civil Engineers. His comments are valid in any courtroom situation when a surveyor appears as an expert witness.

My purpose is to try to talk to you about some of the things I think surveyors have to concern themselves with if and when the result of their work arrives in the litigation process, and there is a serious dispute, and the person who prepared the plan, the information, has to appear in Court to justify the end result.

It seems to me that very few surveyors really understand the objective of, the purpose of, the litigation process. What is it all about? Everybody involved in the litigation process where there is a dispute in a courtroom should be involved really in one search, and that is the search for truth. What actually happened as a matter of objective reality. One side says this happened, and the other side says not so. something else happened. One side says this set of physical monuments appears in the ground and these are the lines of this particular piece of land. The other side says not so, we disagree.

Now, what is the function, what are the methods by which a human being can judge, has got to make a determination, from listening to contrary evidence. People, human beings, are put on the witness stand. They are called testimonial witnesses. At what function do we ask them to perform in a very strange environment. They are brought into a courtroom, a strange forum to many of them in many instances, many of them are nervous, they are uneasy, they are brought before a judge or a jury in a jury case, and this adds to their consternation, concern, and they are asked very selective questions. They cannot express themselves freely as they wish to do, they have to respond to very selective questions. What are they asked to do?

They are asked to go back and verbally recreate something which occurred many months or many years ago. What functions do they perform. Their powers of memory are involved, their powers of perception, and their powers of communication. After they testify on what is called direct examination, they are taken over on a cross-examination by another attorney who tries to dissect, cast out, upon much of what they have said.

It is a very imperfect and imprecise process, the courtroom process, because we are relying on the imperfections of a human being's power of perception, his power of memory, and his power of communication. Any of these powers can fail, due to the fact that a person is testifying about events which occurred months or years ago. It is not easy for a trial judge to reconcile conflicting stories. He or she has got to listen to the events as they unfold and try to make a human judgment as to who is right. Not easy at all.

Now, I have no idea how often you appear in courtrooms. Some of you may appear often, others of you may never have appeared. But just let me try to suggest to you, that if you do appear to justify your work in a contested land matter, let me try to express to you some things that court might expect, some of the things which might be helpful to you to make a more effective presentation.

First of all, it seems to me in cases that I have sat on thus far, the cases that I have been involved in when I was practicing law, that there is not enough communication between an attorney and the surveyor. I'm amazed, frankly, when I see land surveyors get on the witness stand and it almost seems to be that the attorney that was questioning his sur-

veyor is talking to this individual for the first time, trying to learn something about the plan which has been testified to by the surveyor. It's extremely important, it seems to me as professional people which you are, to have sufficient pre-trial time with the attorney who has engaged you. You should be candid with an attorney. If there are problems with the survey that you have done, if there is some doubt with respect to some of the lines that have been drawn, some of the monuments that have been placed on a plan, it's very important it seems to me, for you to relate that information to the person who has engaged you. It's very important from the standpoint of the attorney to tell you, appraise you, in advance of putting you on the stand as to the areas of inquiry.

Many attorneys adopt the process of going through a dry run interrogation so that you may familiarize yourselves with the line of inquiry that will be conducted when you are put under oath and appear on the stand. It is equally important, it seems to me, for you to ask the attorney who has engaged you, what am I likely to be asked on cross-examination. You not only want to know, or should want to know, what you are going to be asked by the attorney who engaged you. But it is equally, if not more important, to know what areas the cross-examining counsel may explore with you.

It is very important, once you get on the stand, to relate your background and experience and your credentials to the court. When a land surveyor is on as a witness and the first question is asked, "Would you relate your credentials, please, to the court," some attorneys have a practice as a matter of trial strategy of standing up and saying, "There is no need to do that, I'll be happy to stipulate that this person is a registered land surveyor and may testify as such." That isn't done in the interest of conserving time, it is done very often in an effort to foreclose from the court the dimensions of that person's background and skill. If I am sitting on a case and have to decide a disputed question of fact which involves two professional skilled people, it is helpful to me to evaluate the judgment and credibility of a witness if I know the professional credentials that an individual has. So, I suggest to you that you spend some time in appraising the court as to the nature of and the dimensions of your background and experience, so that the court can really evaluate the depth of that which you tell it.

Very often when land surveyors appear in a courtroom they are appearing in the nature of an expert witness, not the ordinary witness, the lay person who usually comes into a courtroom. The reason you are there is that you have special skills. Expert witnesses can only testify in a matter of law in courtrooms if the subject matter of the inquiry is one which is beyond the annotated understanding of the fact finder, the jury in a jury case, or the judge in a jury-waived case. You are there to explain and to help and assist the court. You are not there to confuse or to cause difficulty for the court. You are there to assist and help. For that reason, it seems to me that you should be candid and obviously you should be truthful as professionals. You should not be evasive; You should not consider the court or the presiding judge as enemy. He or she is there with the solemn oath to try to resolve differences in judgment, differences in opinion between litigants.

In case you are challenged or if some of your work is challenged, it is helpful to the court if you bring with you the resource material you used to justify whatever survey or plan resulted from your work. There is nothing wrong, as many of you know who have testified, with you resorting to looking at any information you might have brought with you. The best witnesses are certainly not those who merely try to memorize a particular type testimony. You are perfectly free, once you get on a witness

stand and have with you any information that will be helpful in explaining testimony that you give. Field notes, computation charts, anything that you have in your file should be resorted to if it will help you in answering any question that is put to you by counsel or by the court.

If you are given a question by counsel and you do not know the answer to that question, and you can't know the answer, can't testify and respond without looking at something you have with you, don't be afraid to look. Don't take a chance on being wrong by chancing to your memory. If you have a reliable answer in your field notes, must look at certain computation charts that you have in file which you brought to court, by all means just say that you would like to refresh your memory with information you have with you. You need not fear that your case is being weakened, your testimony is being weakened, simply if you have to pause and refresh your memory by looking at everything you brought with you to court.

I ran into a situation a few weeks ago where a land surveyor was trying to justify the existence of monuments which appeared on a plan which was marked as an exhibit and accepted as such. When he was taken over under cross-examination he indicated that he had no personal knowledge of the information that appeared on the plan. He had never gone out into the field, never seen the monuments, and had never known whether or not monuments existed on the ground as had been testified. The surveyor was a contested issue in this case. Cross-examination brought out that he had no personal knowledge, he had never gone into the field and made any personal observation of these monuments.

At that point the question arises as to whether his testimony should be stricken. Is his testimony hearsay? Obviously someone else in his office did the field work and the best he could do was testify that he reviewed the field notes and the computations of the individual in his office. He adopted them and made the required certification. I suggest to you that you should be very much aware that if you get into a very serious land dispute which involves whether or not physical monuments appear in a certain place on the ground that you advise the attorney. In order to establish whether or not the monuments appeared on the ground, if you haven't done the field work, you are not going to be the best witness to testify in that type of case. The person that should testify as to what existed on the ground is the person who saw what existed on the ground and not somebody who had never seen what existed on the ground but to whom the information was related. Courts want first hand primary evidence, not evidence once removed, or hearsay information. Try to remember that. Always spend sufficient time with your examining counsel in advance of trial.

I found when I was practicing law, that clients and even attorneys sometimes were shocked when they received the surveyors bill for professional services, as they were when they received the attorneys bill. One of the problems is that the client or the attorney have no idea how much time you people put in, all they know is that they get in touch with an attorney who very often retains a surveyor and a plan results. They don't know whether you spent two hours, or whether you spent 200 hours out in the field. They haven't the slightest idea. All plans look the same to clients. It's very important, it seems to me, when you send a bill to an attorney for presentation to a client, or if you are dealing directly with a client and not through an attorney, for you to document in detail the number of hours that had been spent in the field, the number of hours in research that had to be expended. If you had a very complicated problem, clients for whom you work just do not understand the skill and the research and advanced state of knowledge that is current in your profession. It's up to you to justify that in detail to them if you expect to get paid without some type of difficulty.

— *The Michigan Surveyor, Spring, 1976*

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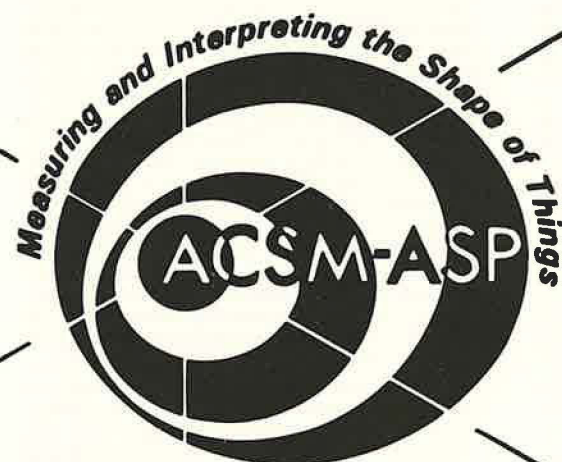
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POTPOURI OF USEFUL TIPS

EDITORS NOTE: Newsletter editors of the various state land surveyor associations usually exchange copies of their newsletters with one another. Many interesting and informative items appear in these newsletters and, in an attempt to share the wealth, this issue of the HOOSIER SURVEYOR contains a number of these articles. Many useful tips on such items as examinations, applicants' qualifications, rules, and principles which form the basis of land surveying are included.

HIGHLY IMPORTANT PRINCIPLES RELATED TO LAND SURVEYS

By R. B. Buckner

(The following is a condensing, for the most part, of principles presented by Curtis M. Brown in his book Boundary Control and Legal Principles.)

1. Original lines surveyed and monumented govern over other field and record evidence.
2. A Surveyor's duty is to follow the written description to retrace original lines as surveyed.
3. Intentions of the parties in a deed description must be discovered through the writings.
4. Intent and senior rights are superior to calls in the survey.
5. Ambiguous or erroneous deed terms may be rejected if the remainder of a description justifies doing so.
6. When conflicts arise in a description, the controlling terms must be discovered and these govern over informative terms.
7. Natural monuments generally govern over artificial ones; and artificial monuments, if original, govern over dimensions.
8. In case of conflicts, distance generally governs over direction in simultaneous conveyances, but distance and direction are considered equal in sequence conveyances.
9. Area and coordinates are subordinate to dimensions in any conveyance.
10. To be controlling, a monument must be called for, identifiable, and undisturbed.
11. Nouns immediately following the preposition "to", define the controlling term; other terms are informative.
12. Improvements can define lot or street lines if they were built in accordance with and soon after original surveys.
13. Proration is used in relocating lost corners where parcels were simultaneously created but not when they were created in sequence.
14. Street lines remain fixed as monumented.
15. Proration or proportionate measurement should be used only as a last resort when position is in fact lost and not merely obliterated.
16. Where overage and shortage exists in blocks, it is not generally prorated across or into streets.
17. Proration usually applies to odd shaped end lots when dimensions are given, otherwise excess or deficiency is placed in undimensioned lots.
18. A call of "to the ... (stream, road, etc)" generally means to its centerline.
19. Proportional "of" conveyances are conveyances by fraction based on area.
20. Dividing lines in proportional conveyances vary according to the specific description wording and configuration of the parcel as originally platted and as it now exists.
21. Reversions are distributed to adjoiners by generally drawing lines perpendicular to the centerline of that which is vacated, to the property corners.
22. Riparian boundaries change when waters change slowly, but generally remain the same if waters change suddenly.
23. Specific rules apply for restoring lost corners and subdividing sections on the Public Land Survey System which differ from some for other types of subdivisions. Government manuals should be consulted for such surveys.
24. Regardless of precedent set, the contrary may be shown and a Surveyor should always be prepared to defend his work.

(from Ohio Surveying News, December 1976)

HOW TO BURY AN ASSOCIATION

From the Texas Surveyors Assn.
Metes and Bounds

1. Don't attend any meetings, but if you do, come late.
2. Always leave before adjournment.
3. Never speak up at any meeting. Wait 'til you get outside.
4. Sit in the back of the room, where you can chat freely with other members.
5. Vote in favor of every action. Then go home and do nothing.
6. Find fault with the officers and the other leaders every chance you get. It keeps them on their toes and enables you to say, "I told you so!" if something doesn't work.

7. Take all you can get in the way of benefits and services. Give as little as possible in return.
8. Keep your ideas to yourself. But be a good listener and pick up all the tips you can from others.
9. Never ask anyone to join. Only fall-guys serve on a membership committee.
10. Only serve on a committee if they make you chairman. Do as little as possible and try not to call a meeting. You can always report progress.

SPECIALTIES FOR LAND SURVEYORS?

by F. Henry Sipe LLS Elkins, W. Va.

If you were a landowner and needed a surveyor to relocate the boundary lines of your rural property, how could you be reasonably sure to find a competent surveyor? Look in the yellow pages of the telephone book? This can't help you much now, because specialties are unlisted.

Surveyors vary in their ability to perform specific types of surveys. Some are expert in subdivision layout, some in retracing old rural lines, some competent only to survey out a small lot from a larger tract. So the landowner may employ the wrong surveyor even though a surveyor should not accept a case if he is not competent to do it.

The medical profession has attacked this problem by listing doctors by such types as internal medicine, gynecology, surgery, pediatrics, dentists, urologists, etc. Engineers are listed as civil, mining, mechanical, electrical, etc. These are listed in the phone book. Up to now, lawyers have generally been listed in one group, but they are becoming increasingly conscious of the problem. In California, lawyers may now list their specialties and they are required to qualify in them. Florida began a similar plan in January 1976. The traditional restraints against advertising seem to be lifting.

It seems clear that surveyors not only may advertise their specialties, but we should do so, to be fair to the public we serve. If one surveyor knows what the other surveyors' specialties are, he can better refer prospective clients to them. We should advertise not only on letter heads and business cards, but in the yellow pages. Maybe State Registration Boards or State Surveyors Associations should issue certificates for specialties? West Virginia already issues one specialty certificate (underground).
(From: The West Virginia Surveyor)

FAVORABLE REACTION

Here are ten reasons why people do react favorably. These are not listed in order of importance, for all are equally so; they illustrate that the more opportunity you give a person to react favorably to a request, the more likely it is to be carried out.

1. People react favorably when they have a sympathetic interest in the project—but not when they are against it.
2. People react favorably when they see some benefit in the request for themselves. This benefit may be no more than the pleasure of being called on to do something, or satisfaction in an opportunity to be effective. Or it may be more selfish.
3. People react favorably when they know precisely what is expected of them and what they must do—but not when the request is vague and unspecific.
4. People react favorably when they respect, admire or recognize the person making the request, but not when they don't know the communicator, or actively dislike him.
5. People react favorably when they understand why the request is made, but not when the request makes no sense to them.
6. People react favorably when they feel there is importance in what they are asked to do, but not when they feel the work is meaningless or useless.
7. People react favorably when they understand the time element in a request and feel it is reasonable, but not when there is no time specified or when the time given is unreasonable.
8. People react favorably when they feel they are being given the opportunity to cooperate, but not when they feel they are being commanded to do so.
9. People react favorably to clear, simple, easily-understood requests, but not to confusing, verbose, or terribly complicated directions.
10. People react favorably to sincere requests, and not requests which seem insincere, devious, or made with motives not clearly visible.

(From The Georgia Land Surveyor, June 1977)

BY HOOKE OR CROOKE

(original source unknown)

There is no principle of law any better established by the custom of the world for all time than that a corner that has been acquiesced in by all parties interested in permanent and unchangeable except by the will and act of all parties interested. The great fire in London, England in 1666 destroyed not only the ancient land marks but all evidence of their former location. The only evidence of their former location was the memory of men still living and the measurements from objects whose location was known. A man by the name of Crooke, had been surveying so long in the city that he was supposed to know every corner in it. After the fire the city council appointed as city surveyor a man by the name of Robert Hooke who was esteemed the most profound mathematician and philosophical mechanic of his time. It is said that the wonderful sagacity, almost intuition he showed in deducing correct conclusions from meagre premises has never before nor since been equalled. It was generally conceded that the location of any old corner could be correctly located by the memory of Crooke or the reasoning of Hooke. That is, either by Hooke or by Crooke." Hence the expression we hear today. But in no case did they attempt to locate a corner without good evidence that it was where the old corner stood before the fire.

(From The Ohio Surveying News)

SURVEYORS TO COORDINATE NATIONAL EXAMS

The National Council of Engineering Examiners recently announced the appointment of Dr. R. Ben Buckner as Land Surveying Exam Coordinator for the Fundamentals and Principles and Practice of Surveying Examinations prepared by NCEE. This recent appointment of Buckner as consultant follows the appointment this year of Morton S. Fine as Executive Director. Fine is a registered Land Surveyor in several states. Buckner will work under Fine and with the NCEE Land Surveying committee in matters related to the collection, selection, editing, and assembly of the three national exams in surveying. He will also advise and consult regarding improvements in the exam syllabi and bibliography, question and problem formats, and methods and techniques of writing questions and problems.

It is hoped that improvements will be seen. Mr. Fine wrote in the January NCEE Bulletin that, "We must strengthen, improve and speed up the examination process . . . We must involve any members in the various states who have special expertise . . . We must enlist the aid of others in the preparation of examinations . . . The land surveying exams especially need attention . . ."

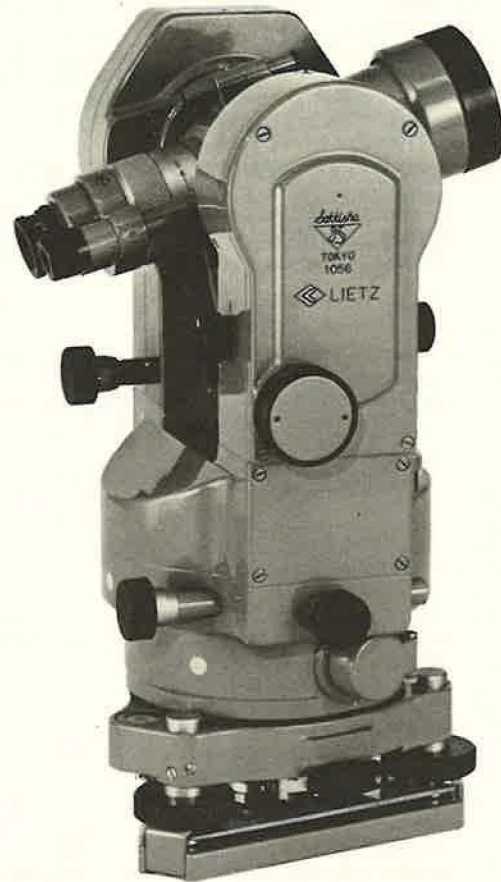
Anyone who has ability and interest in writing surveying exam questions or problems should write to Dr. Buckner, care of NCEE, P.O. Box 5000, Seneca, S. C. 29678. NCEE pays \$5.00 for multiple choice questions and \$25.00 for problems.

The exams are based on a syllabus prepared by the NCEE Land Surveying committee. Anyone having suggestions on the content of the exam should direct them to that committee and not to Dr. Buckner.

Ohio uses the above mentioned NCEE exams which consist of Parts 1 and 2 (Fundamentals) and Part 3 (Principles and Practice, A.M.) The P.M. of the professional exam is not included. This part is prepared in Ohio. To become licensed in Ohio, an applicant's average score of the A.M. (NCEE), P.M. (Ohio), and oral must be above passing.

FUTURE CHANGES IN NATIONAL SURVEYING EXAMS

The National Council of Engineering Examiners recently decided to change the format for the Fundamentals and Principles and Practice of Land Surveying examinations, effective November 1977. Part I will still be 100 multiple choice questions, but it will be closed book and primarily qualitative questions or very short, one-step numerical exercises. Part II of the Fundamentals will be 25 short, but pertinent problems, each 8 to 10 minutes in length. This exam now has 10 lengthy problems, the applicant selecting 5 of them. Part III will contain 12 professional situation problems of which the applicant will select 10. This exam now has 100 multiple choice questions. The changes are felt to improve the exams in that the fundamentals will be covered more thoroughly, more depth will be built into the professional portion, and applicants for the professional portion will have choices to allow for regional differences in practice. Ohio uses all three parts of the National exam.



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EXAMINATION TIPS

Prepared by John Petri and published in THE CALIFORNIA SURVEYOR, Spring edition, 1977.

After reviewing several years of Land Surveyor examinations, I would like to offer the following advice to future examinees. This is not a magical formula for passing, but rather some tips to help you prepare for it and to help prevent you from falling into some of the pitfalls that have consumed some past examinees.

I. Preparation.

1. Review for the exam for a period of from two to three months prior to the exam. Past exams offer insight into types of questions and areas of study.

2. Don't attempt to cram the night before the exam; that is one of the surest ways to guarantee you will do poorly. Don't even think about the material the night before, relax and get plenty of rest so you are fresh and alert the next morning.

3. Think positively; think of the exam as an opportunity to demonstrate your skills and knowledge rather than a device to trip you up.

4. Self-confidence is one of the most important assets you can take with you into the exam.

5. Keep calm; there is no need to panic; remember, everyone is taking the same exam and there will always be some who pass. If you have properly prepared for it, it will probably be you.

II. Examination Strategy.

1. Read the directions carefully.

2. Look over the entire exam to get an overview of the scope, nature and difficulty of the exam. This also gives you an opportunity to relax before beginning.

3. Complete the easy questions (those you know) first. Read and temporarily postpone the tough one (those you anticipate trouble with).

4. Budget your time. Then alter your schedule so that you can spend more time on those with higher point value. Stick to your budget intelligently.

5. Give yourself short rest periods; rest your eyes, stretch your legs, shift your body and take a couple of deep breaths. You will break mental and physical tension and be able to get back to the exam refreshed.

III The Examination.

1. Read the problem carefully being careful to recognize exactly what is being asked.

2. Think your solution through prior to beginning work on the problem. This could avoid wasting a great deal of time going up a blind alley.

3. The Examination's purpose is to test your knowledge, not to trick you, therefore, if you do not use most of the information given in your solution or if you must make more than the most basic assumptions, you have probably misinterpreted the problem. Go back and read it again - with an open mind.

4. If you find the answer to a particular question in reference material, do not copy it verbatim, but explain it in your own words. The examiners are looking for the fact that you understand the concepts, not that you have good reference material.

5. If possible, estimate the answer to a calculation prior to calculating the result. If the two do not check fairly well, determine the reason why.

6. After completing the necessary questions, don't leave early. Proof-read your answers and solutions to make certain you have said what you meant to say or haven't made a minor mistake which can be easily changed. Don't attempt major or wholesale changes at this time. Don't make changes unless you are quite certain that you are wrong in the first place.

7. Show your work! The importance of this cannot be stressed too strongly. Granted, with the advent of the calculator it is not necessary to show every calculation, but you should show the formulas used and give a step by step accounting of your solution. Without this, you are betting 100% that you have not made even the slightest error. By showing step by step procedures, even if your answer is wrong, you will receive partial credit provided your technique is correct.

Good luck on future exams! Remember, however, that your destiny is in your hands; there is no substitute for good preparation.

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TELL IT THE WAY IT IS

The following editorial is from the
MLSA's DIS-CLOSURES.

Professionalism in any endeavor begins with integrity and responsibility to the public and oneself. We, as land surveyors, are directly responsible to our State Board of Registration to help them in their decisions relating to the qualifications of applicants for both L. S. I. T. and R. L. S. through the professional references as requested by the Board.

Are you doing anybody a favor by writing a half-truth reference? The Board of Registration is misled and cannot render a sound decision. Land surveyors as a whole may be harmed by the admittance of unqualified persons to the profession. The public may be adversely affected by not being protected through competence by the practitioner and the applicant may be allowed to practice land surveying without the proper background and judgment experience to responsibly protect himself.

A statement such as, "Mr. _____ has worked for us in surveying for several years and has been a conscientious employee . . ." does not shed much light on his competence as a land surveyor. Being in direct charge of land surveying projects relating to corner retracement, technical applications and management of subordinate personnel requires extensive training and experience. We can not make the mistake of not alienating someone personally by giving them a reference with less than full disclosure.

In conclusion, if the applicant is qualified, give him or her a well deserved, good reference that is complete and leaves no doubt that this is the case. If the reverse is true, tell it the way it is. By following this guideline, everyone from the general public to the applicant will benefit. It is the responsibility of all of us to strive toward upgrading land surveying professionally and there is no better place to start than with our references.

TWELVE RULES FOR LAND SURVEYORS

By Carlisle Madson, Hopkins, Minnesota

1. To avoid liability the surveyor should err on the side of safety. Always try to do a little more than an ordinarily prudent surveyor would do under the circumstances.

2. It is the land surveyor's duty to correctly locate and mark property lines as described in a deed furnished him and to relate lines of possession to title lines. The surveyor cannot and does not assume the responsibility of proving that a given deed is correct and legal; that is a function of an attorney or court of law.

3. Search and search well! If it is there, find it. If it isn't, be able to say with certainty that it isn't there.

4. Liability results when the surveyor fails to do correctly the thing that he purports to do.

5. The surveyor is a fact-finder. He goes upon land armed with all the documentary evidence that is available and searches for markers, monuments, and other facts. After all the evidence, facts, measurements, and observations are assembled, the surveyor must come to a conclusion from the facts.

6. Never set a corner in disagreement with improvements without first satisfying yourself that you are not only right, but that your "right" will prevail in court if necessary.

7. Discovery of county surveyor's monument does not relieve the surveyor of the obligation to look further. The county monument is only proof in the event that superior evidence cannot be discovered. Therefore, the surveyor must seek all other evidence and use the official monument as though it were the last resort.

8. The conclusions that flow from the evidence may produce proof. Evidence in itself is not proof of a fact; a conclusion or inference that may be drawn from evidence is the proof. In coming to conclusions from evidence, the most important need of the surveyor is the ability to recognize and know what is the best evidence of that available.

9. The best evidence of a monument's original position is a continuous chain of history by acceptable records, usually written and dating back to the time of the original monumentation. A found monument without background history is of little value as evidence; and, a set monument is worthless if unidentifiable in the future.

10. In civil cases having to do with land surveying and real property it is only necessary to prove a "preponderance of evidence"; it is not necessary to prove "beyond a reasonable doubt" as in criminal cases.

11. It is of the utmost importance that a surveyor seek and find all of the evidence at the time of the initial survey, and this must be done irrespective of costs. The major cause of disagreement between surveyors relates to the lack of discovery of all available evidence. If every surveyor uncovered all of the evidence, differences would be reduced to a minimum and their surveys would have a finality of location!

12. A surveyor may be able to compute, make drawings, use instruments, and take engineering projects, but, until he understands property line law and the law of evidence, he is not qualified to make property locations.

A TIRED SURVEYOR SPEAKS OUT

Thanks to the efforts of such people as the members of ASPLS, the kind of practices described in the following article are declining. There are still a few such folks around, however. I, too, am tired of this attitude toward surveying and toward the public. The article appeared in The Old Dominion Surveyor in 1970.

I am a tired surveyor who has tramped the fields and woods of Virginia, West Virginia, and Maryland.

I am tired of finding survey after survey of record that will not close. If the pharmacists in the past years had exercised the same degree of care in preparing their prescriptions as many surveyors have in preparing their plats, we would nearly all be dead.

I am tired of taking these same plats in the field and finding every line in error, when the monuments can be found. A little old lady with a six-inch ruler can measure a hundred foot line closer than a foot and a half to two feet. There are surveyors in business today who will consistently be in error more than one foot on a hundred foot line, more than ten feet on a thousand foot line.

I am trying to reason out why the average carpenter, in cutting rafters, can measure to the nearest eighth of an inch; whereas a professional, licensed to practice under the various registration laws, will have from three to five-tenths error between two pipes fifteen to eighteen feet apart.

I am tired of finding professional surveyors' work that calls for a fence line that was put up by farm labor during slow periods where the fencers thought the line might go, when ten minutes work at the Clerk's Office would show that the fence line was not on the property line. If lawyers prepared their cases with the same degree of care that these people prepare for their field work, everyone would represent himself.

I am tired of wearing a sickly grin and a stiff upper lip as I tell clients that "Mr. So and so," registered surveyor, did good work, that all of us make errors and that in this particular case a loss of his bedroom, kitchen and half of his front hall must have been caused by a momentary lapse in that sterling character's 99.44 percent pure and errorless work.

I am tired of finding surveys of record, made three or four years apart by the same so-called "surveyor," of contiguous tracts where every call is different and where they don't even have the same number of property lines and no mention of discrepancies is noted on their plat.

I am tired of finding surveys that were made to effect a change in boundary mutually agreeable to both parties that do not contain any reference to the fact that the survey does not comply with the deed. As the lawyers examine these deeds later, they are remarkably stuffy about saying you can't transfer land by survey.

I am tired of seeing plats of record that can't be read. With mechanical drafting being taught in most high schools, a free hand fountain pen plat on a sheet of paper, with a longhand legal description, doesn't strike me as being quaint. When it can't be read with any degree of certainty, I find it even less quaint.

I am tired of professional surveyors who can't spend eight or ten hours learning to do circular curves. When a man runs a curve in a series of chords and calls the chord the property lines, this leaves an awful lot of segments still in the ownership of the seller and severely complicates a boundary description when you survey the residue.

Most of all, I guess I am tired of state laws that will allow that noble old profession of land surveying, containing the most noble and the best of all Americans, to be inundated by quacks. No amount of reasoning about quaintness, cheapness of land, lack of money on the part of clients, or anything else, can justify the continued existence of a man in the profession of measuring land who can't measure a hundred feet to within a plus or minus two feet. The sloppiness invading the quack portion of our field is so extensive that it almost has to be premeditated. No one could make errors of the magnitude and frequency that occur in this quack work without trying to do bad work. Every dime of fee they obtain from the innocent public is a fraud on that innocent public. I am tired of everything about them except one thing: I would be willing to go to the ends of the earth to get rid of them.

MISSOURI SURVEYS TO BE PRESERVED BY MODERN METHODS

The half-way point in a state-wide effort to upgrade and preserve important land survey documents in Missouri was reached with the presentation of 1,517 microfilmed land survey records to the Boone County Recorder by Missouri Land Surveyor Robert E. Myers, of the Department of Natural Resources. Boone County, Missouri is the 57th county in the state to have this important documentation performed.

Copies of the survey records of the 57 counties are now stored in the State Land Survey's modern repository in Rolla, Missouri, along with over 300,000 other pieces of survey information. The Land Survey, a part of the Geology and Land Survey Division of the Department of Natural Resources, uses microfilm and electronic data processing to record and secure existing survey records and to make them readily available in a central location. County records are stored with Missouri's official land records which were transported to Rolla earlier for security and maintenance in a modern controlled environment vault.

Records such as these are always susceptible to fire, deterioration, and theft. Unfortunately, loss or damage may not be noticed immediately. Because of the State Land Survey's state-wide microfilming program though, survey records for 57 counties are protected by being recorded on archival film having a minimum life span of 120 years. Their preservation is practically "fool proof" since a copy of each document is maintained by the County Recorder; a film copy is filed in the Land Survey Records Repository; and a security copy is placed in a modern vault.

The vault, which is designed especially for storage of film and documents, has controlled humidity and temperature. Circulated air is electrically cleaned and smoke detectors are installed to automatically release halon gas to smother combustion. The entire system is tied in with the police and fire departments as a further precaution in safeguarding these valuable documents.

County land survey records have been preserved on film in the same condition they were at the time of filming. This is one of the advantages of microfilming. In many cases, too, microfilmed copies are clearer and have better contrast than original documents because of modern filming techniques. Paper documents normally deteriorate with age and eventually become useless as public records. The life span depends on moisture, temperature, and light as well as on handling and other factors.

Processed film of the land records is placed in plastic jackets to protect it. In addition, contact prints are produced on diazo film (called microfiche) which can be handled normally without worrying about damaging it.

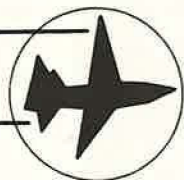
A unique index has been designed to include all surveys filed in the State Land Survey Repository. Pertinent information is extracted from each document and stored in a computer memory bank. The computer is programmed to produce desired information in a sequential printout that serves as an index listing of the townships, ranges, sections, and subdivisions in each county. In addition, the survey dates, surveyors, books, and pages where original documents can be found, and microfilm identifications are given. This computerized index is independent of the systems used in each county, yet it includes all county survey records so that particular ones may be retrieved quickly. Surveys from sources other than official county records, such as private and government agency records, are also indexed.

This microfilm and index system saves many dollars each year in time needed to research the history of particular areas, Myers said. A search of the index reveals in a short time if information is available and, if so, the book and page and the microfilm where it is recorded as compared to a laborious search through various indexes and volumes.

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Introduction

An instrument man, as long as he obtains constant good results, should not tamper with his instrument. The old saying that curiosity kills cats could be paraphrased to say that curiosity also incapacitates instruments. Most times the difficulties are not with the instrument, but in the manipulation and handling of the instrument. Any disassembly or adjustment should be made only by one who is thoroughly familiar with the construction and adjustment requisites and with the care needed to do this work.

Preventative Maintenance

It is always best to prevent difficulties. Dust and moisture may cause trouble; therefore it is recommended that a hood be used to protect the equipment when it is exposed to the elements and is not in use. If cleaning is necessary use only the proper equipment, such as lens tissues, lint-free cloths, clean brushes and proper lubricants. Tripod legs should be examined frequently, and varnished to give them longer life.

Manipulation

In setting up an instrument, it is recommended that the tripod bolts be loosened prior to pushing legs in the ground and then re-tightened before the instrument is leveled.

In sighting a telescope, try to turn the motion always in a direction to oppose the tangent springs. Sometime a light tapping with the forefinger on the plate will make for stability. Use care in focusing the objective. This removes parallax in the telescope. Read verniers by sighting along the line of coincidence to avoid parallax.

If the telescope level is used for leveling the instrument, more accuracy is possible since the telescope level is at least twice as sensitive as the plate levels. The procedure is to level the plate as closely as possible, then the telescope level. Revolve the instrument 180° and bring the telescope bubble half way back using the leveling screws, and make the remaining adjustment by the axis tangent. Repeat in both directions until the telescope level remains centered in all positions.

Precautions

It is well to re-check any apparent maladjustment before proceeding to make any adjustment. Then follow the rules of adjustment in the proper order.

The telescope is one of the important parts of your instrument. Light may be obscured by dust or moisture. Dust can be removed with a soft brush and lens tissue. Do not remove the lens from the telescope unless absolutely necessary, and then replace in exactly the same position. If moisture gets into a telescope, it is best to remove the eyepiece, cover the end with a clean cloth and allow the telescope to dry in a warm room.

Any change in the positioning of the objective lens will change the collimation, therefore, if the objective lens is removed for any reason whatsoever, the collimation adjustment must be checked. It is recommended that the instrument man make certain that the objective lens is tight in the telescope and in its setting, since any movement of the lens in the telescope or in the setting will throw out the line of collimation.

A small amount of looseness in the objective slide or the focusing slide can be corrected by tightening the pinion. A loose focusing slide, however, needs refitting.

Testing and Checking

Another difficulty, called "walk", may be encountered when the horizontal axis is loose. This can be tested by placing the fingernail in such a position that it touches the end of the scale and the standard simultaneously, and attempting a movement of the telescope from side to side. Most instruments have means of removing this looseness, and this should be corrected, otherwise side movement of the line of sight will be apparent. Sometimes the axle will wear out-of-round. To avoid this it is recommended that the telescope be used in the inverted position frequently.

Level vials may also be a source of trouble. If a vial is loose in the case, it is almost impossible to make an adjustment. Looseness can be detected by using the fingernail on the vial and case and attempting to turn the vial in the case. If the vial is loose the plaster-of-paris or other material used for cement must be removed and the vial re-cemented. Heat from the hands will cause a level to move off center; therefore in handling the instrument take care to keep the hands away from the level vials.

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The more sensitive the vial, the more it would be affected. The same is true when a level vial is partly in the sun and partly in the shade. Some level vials may be erratic because crystals have formed inside the tube. This causes a jumpiness in the bubble. Crystals can be detected by the use of a magnifier, and the only solution is replacement of the level vial.

Extreme care should be taken in cleaning graduations. Normally a damp cloth will remove most dirt and dust. Be careful not to rub the edge of the circle, as it may be rounded over easily.

The usual difficulty in a compass needle is the center pin. This becomes blunted because the needle has not been lifted off the center pin for instrument transport. Usually a needle will hold its magnetism for a long period and a slow or sluggish needle means that the center pin needs resharpening.

A Few Helpful Hints

Keep instrument clean. Use soft varnish brush to dust. Wipe with cloth. Use waterproof cover to protect from dust or rain.

Clean out box. Blow out dirt and dust with an air hose. Wipe out with damp cloth. Let dry. Adjust supporting blocks to fit instrument.

Wipe off and clean tripod head, particularly the threads. Varnish the tripod legs. Use wax on sliding section of the extension tripod. Keep clamp screws clean. Do not drop tripod in the mud or dirt.

If possible, store the instrument at the same temperature it is being used in -- it will not take as long to come to temperature and will not be so apt to fog up. Fogging occurs when the instrument or lenses are colder than the air.

Emergency Procedure In Case of Accident

If Transit is bumped or has a fall - HANDLE WITH EXTREME CARE.

First, clamp all motions. Leave CLAMPED during initial inspection. Examine for apparent bent or broken parts: broken tangent screw heads, broken clamp screw heads, broken focusing pinion, broken eyepiece cap. Check if objective setting is loose or bent.

If inspection shows damage bring the instrument in for repair.

Next check to see if the vertical circle is misaligned with vernier. Under magnification the vertical circle should be flush with vernier.

Check to see if Horizontal "A" and "B" verniers show misalignment. Under magnification the verniers should be very slightly lower than the circle. If one is higher than the other, something is bent.

If there is any misalignment bring the instrument in for repair.

Second, if nothing is apparently wrong - PROCEED WITH CAUTION. Loosen Axis Clamp and rotate telescope very slowly. If rubbing between vertical circle and vernier occurs stop, clamp, loosen vernier and drop down. Bring the instrument in for repair.

If nothing is apparently wrong with axis, loosen lower clamp and rotate instrument very slowly. If binding occurs stop, clamp, and bring the instrument in.

If lower motion rotates freely, clamp lower motion, loosen upper clamp and rotate upper motion very slowly. If binding occurs stop, clamp and bring the instrument in.

If binding does not occur, use magnifier to be certain that the verniers have not caused pick-up on the limb.

Third, if all rotations are free test for bent centers as follows: Level up the instrument roughly with plate levels and complete leveling with telescope level. With telescope level centered unclamp upper and lower motions. Hold the plate and standards stationary and slowly rotate the horizontal circle between the leveling head and plate. Observe the telescope level to see if it moves from center. Any movement will indicate bent centers and the need for repair.

Fourth, if all of the above indicate that there is nothing apparently wrong, check and perform the regular adjustments as needed, If in doubt, bring the instrument in and we will check it for you to be sure nothing is damaged. At the first opportunity the instrument should be thoroughly and completely checked in the shop. Be sure and let us know if an accident has occurred when you bring the instrument in.

It is a good idea to have any employees report immediately any occurrence that might affect the operating condition of your instrument. Attempts to cover-up accidents can be spotted when the instrument is brought into the shop for repair or alignment.

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Key National Survey Control Completed After 15 Years

A 15-year transcontinental survey to upgrade the national network of horizontal control which is the basis for all other surveying in the continental United States was completed before the end of 1976.

A field party from the National Geodetic Survey, a component of the National Oceanic and Atmospheric Administration, closed a gap in the network between Gaylord and Mt. Pleasant, Mich., before December 1, 1976, completing an effort begun in 1961 at Cape Canaveral, Fla.

Capt. Leonard S. Baker, Director of the National Geodetic Survey, said the project's completion represents "the most accurate survey of this size ever done in any country on earth, and its results will serve our surveyors, engineers, and scientists for many years into the future."

Known as the High-Precision Transcontinental Traverse, the project provides data for tracking space satellites and missiles, and for detecting and evaluating long-term crustal movements. It also provides the network which is the basis for all types of surveying, including locating permanent boundaries, planning the alignment of highways and public utilities, and mapping natural resources.

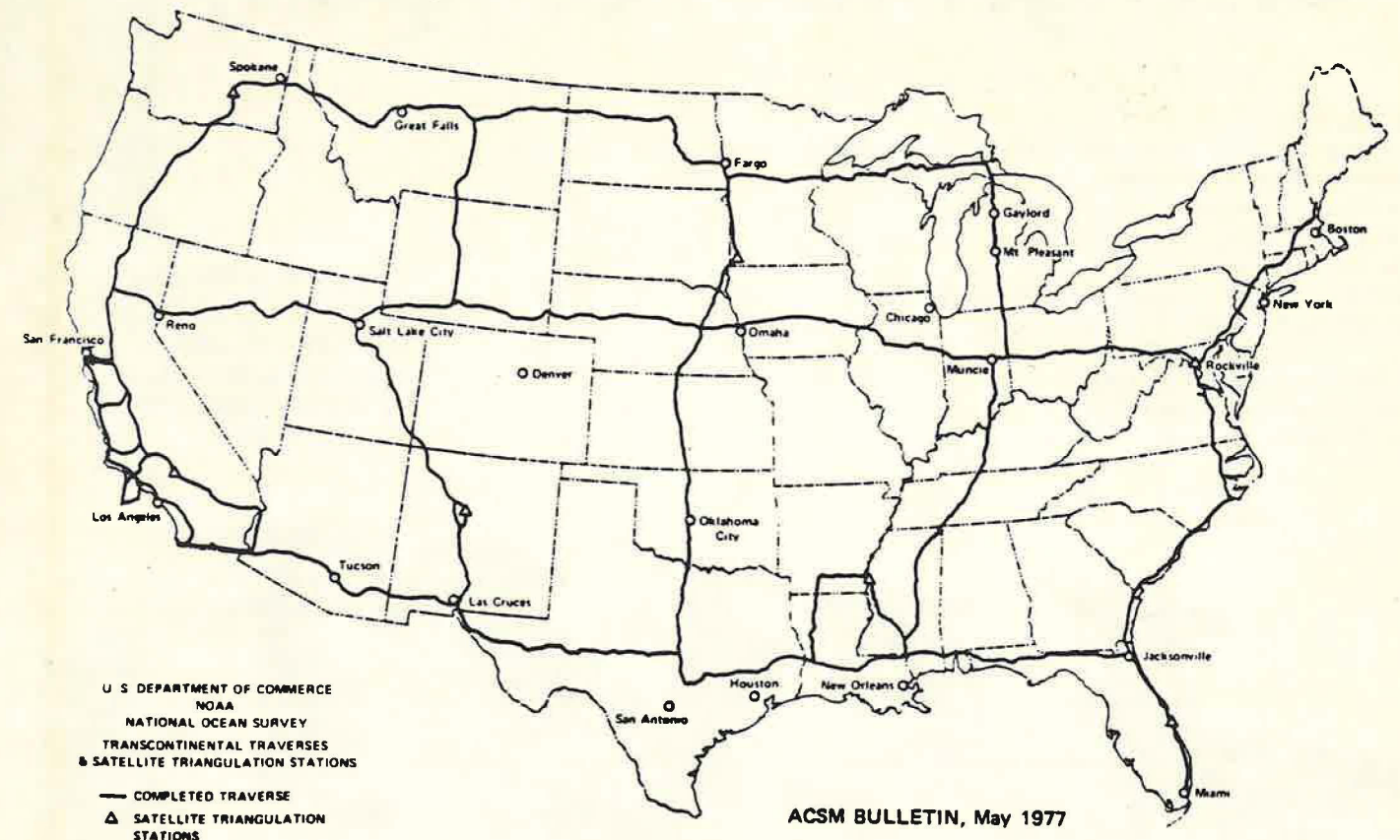
The survey was begun at Cape Canaveral to position satellite tracking

cameras along the east coast of the United States. In order to meet accuracy requirements, a system of high-precision traverse networks was developed, permitting measurements so precise that error was less than 1 in. (2.5 cm) in 10 mi. (16 km).

The 17-man survey party in Michigan, headed by Lester H. Williams of Clinton, Ark., worked at night, when atmospheric distortion was at a minimum. They surveyed from portable steel towers, up to 10 stories in height, permitting the use of laser beams for greater accuracy in measurements.

Since 1961, field parties have determined the geographic positions (latitude and longitude) of more than 2,750 sites, spaced at intervals of approximately 10 mi. along the 13,660 mi. (22,032 km) route in 44 states.

Members of the field party who completed the project were: Dan Bowling, Hamilton, O.; Donald Conklin, Corunna, Mich.; Jeffrey Connor, S. Hamilton, Mass.; Michael Fowler, Elizabethtown, Ky.; George Heid, Washington, D.C.; Hollis Howes, Boonville, Ind.; Kenneth Hunt, Corunna, Mich.; Gerald Jahn, Paynesville, Minn.; Robert Kokesh, Sundance, Wyo.; Gary Lyke, Osceola, Mo.; William Mast, Eads, Colo.; T. J. Mills, Dewitt, Ky.; Orland Murray, Houlton, Me.; Gregory Smith, Enderlin, N. Dak.; Donald Tyler, LaMonte, Mo.; and Rick Woodruff, San Diego, Calif.

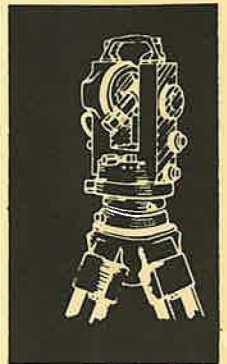


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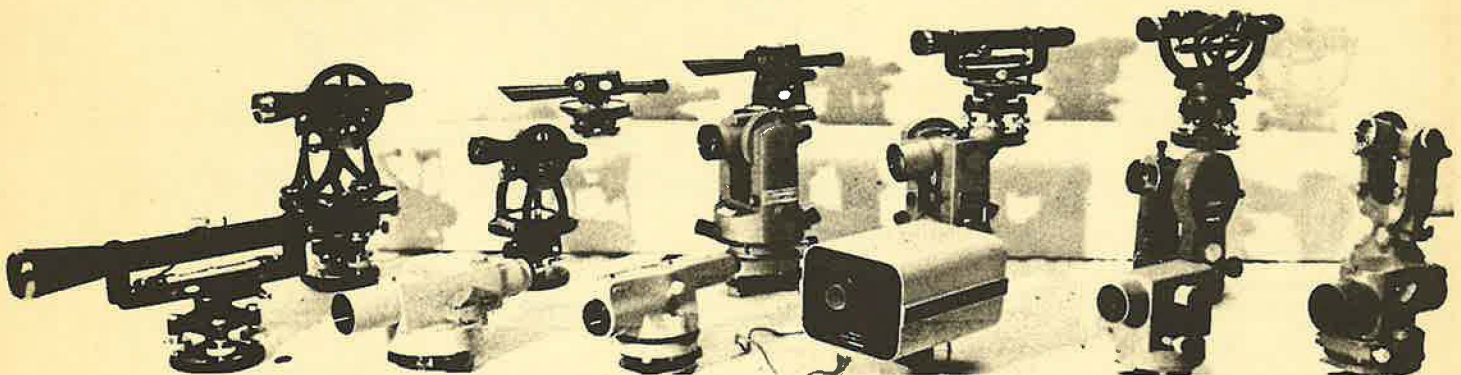
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