

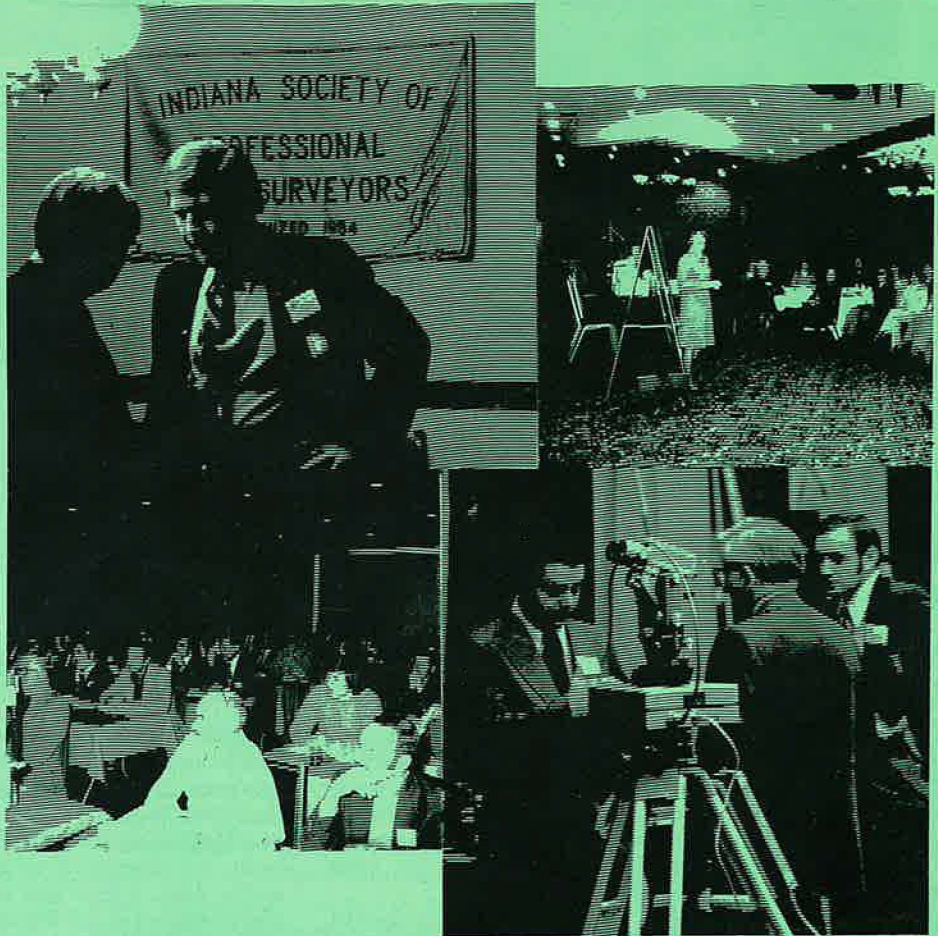
SURVEYOR

HOOSSIER



Indiana Society of Professional Land Surveyors, Inc.

VOL. 2 NO. 1 MARCH 1975

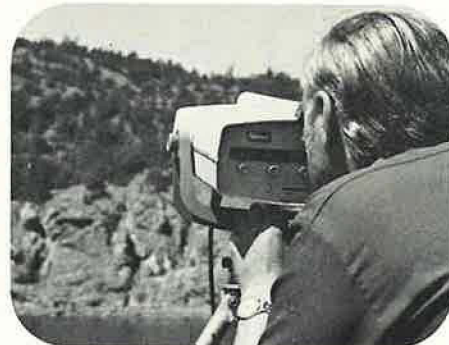


- **HIGHLIGHTS OF THE 1975 ISPLS ANNUAL CONVENTION**

- **Recommended Right-of-Way Practices**
- **New Registrants Listed**



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VOLUME 2 NO. 1 MARCH 1975

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Purdue Offers Mini Courses

The students in the land surveying program at Purdue University, Lafayette have a chance to take nine credit hours of free electives during their senior year. In order to offer some course work in areas related to land surveying where no courses now exist, three mini-courses of one-credit each are being offered for the first time this Spring Semester. These courses are "Land Parcel Identifiers for Information Systems", "Dendrology for Surveyors-Tree and Wood Identification" and "Principles of Right of Way Acquisition". The courses are being taught by Professors McEntyre and Dean.

IUPUI Offers Two Continuing Education Courses

Two courses are currently being offered by IUPUI for Indianapolis area people. One course is a practical course developed to acquaint the novice with the principles of surveying use of the transit and the level, the proper method of obtaining and recording field notes, and layout and topographic drawings. The sessions both lecture and labs are being held during February, March and April and are taught by Robert Merz.

The second course is a review course for the land surveyor's exam covering appropriate subjects pertinent to the State Examination. The course is being taught during January, February and March under the direction of Richard Beck.

Both courses are being taught at North Central High School. Information can be obtained from Continuing Education Services, IUPUI, 1201 E. 38th Street, Indianapolis, Indiana 46205.

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

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Kenneth S. Curtis Editor
 Greg Schenkel Assoc. Editor

PRESIDENT'S COMMENTS



I would like to express my appreciation to Past President John McEntyre, the officers, Tom McComb and Greg Schenkel and the Board of Directors for making 1974 one of the better years for ISPLS. The Annual Meeting just concluded was great, although not without some minor problems. The retaining of McComb and Associates was one of the major accomplishments of 1974 and will continue to strengthen the Society in 1975. The key word in 1975, in my opinion, is Participation. Only

through individual member participation can the society grow. Take an active part in your local chapter and if you are in an area without a local chapter, form one! The Board of Directors and McComb and Associates is more than willing to help.

Should you have a "gripe" - whether it be conference suggestions, unethical practice, fees, or whatever - participate by writing a letter to either myself or McComb. I can assure you of a prompt reply and a referral to the Board of Directors, if needed.

I have not filled all committee appointments and would prefer to have members volunteer for committee assignments. If you are willing to actively participate as a committee member or chair a committee, please notify me immediately. Meetings of the Board of Directors have been scheduled on a regular basis, and the meetings are set for April 11, June 13, August 8, and October 10, 1975. So if you have a matter that requires Board action, please keep this in mind.

The major item of controversy at the last annual meeting involved County Surveyors and Private Practice. This matter was tabled and referred to the Board of Directors for further action. At the Board meeting held February 8, 1975, the following motion was made and passed:

"Also that there be established

an ISPLS-CSA Joint Committee to work toward a common position regarding any areas of conflict between the two organizations or their individual members and to prepare a joint position paper on said conflicting matters relative to duties, responsibilities, and ethics regarding the Office of the County Surveyor which will insure that the best interests of the public and the profession will be served."

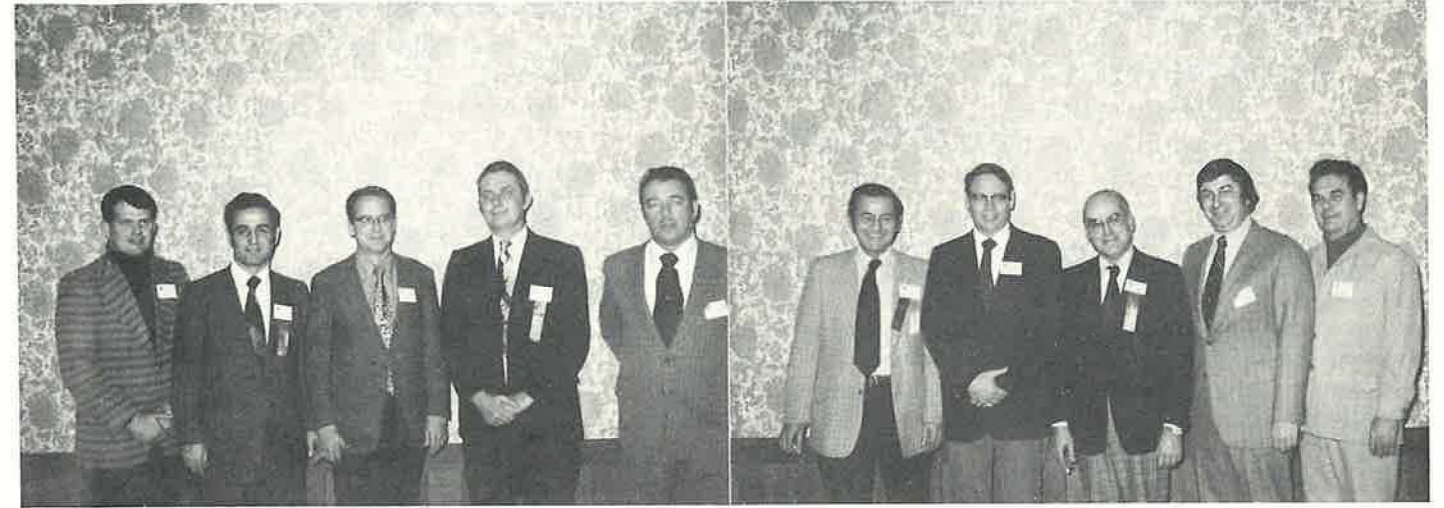
I have appointed the following members from ISPLS to serve on this committee: Wes Day, Orwic Johnson, and John Schneider.

Since I am also serving as President of the County Surveyor's Association until March 14th of this year, I feel it is better for the new President of C.S.A. to make his appointments to this committee. There was considerable interest in this matter at the meeting and the vote was close, so if you have opinions for or against, please send them to Tom McComb at Society Headquarters. Without your input, the committee cannot truly reflect the opinions of the members.

The 1976 conference is set for January 29-31, at Stouffer's Inn. Your suggestions will be appreciated.

The year 1974 was great for ISPLS and with your participation I would like to make 1975 an even better one!

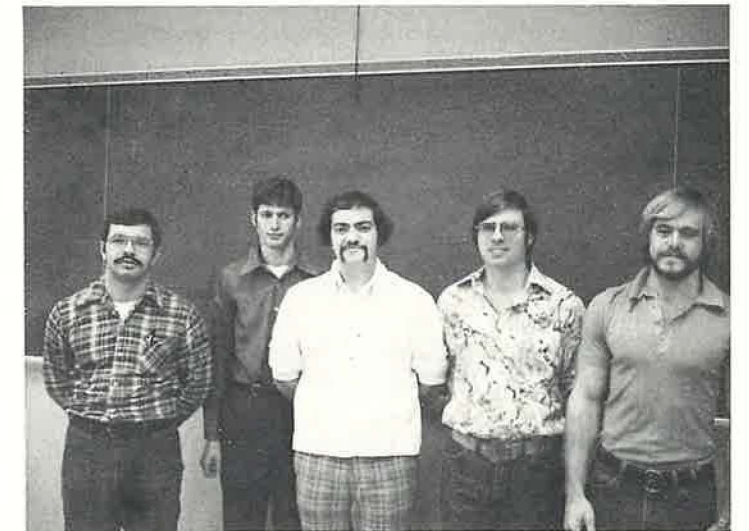
1975 Members of the ISPLS Board of Directors are, left to right:



Roger Woodfill, Lawrenceburg; Zohrab Tazian, Fort Wayne; Orwic Johnson, Columbus; Charles Campbell, Indianapolis; William Tanke, Valparaiso; Wesley Day, Whiteland; Rex Bowman, Lafayette; John McEntyre, Lafayette; John Schneider, Indianapolis; and Carl Anderson, Lebanon. (Absent from the picture is Brian Dickerson, Lafayette.)

New Purdue Land Surveying Graduates

Five additional land surveying students completed their degrees of bachelor of science in land surveying (BSLS) at Purdue University in December 1974. The graduates and their employment are, left to right, Delmar Maudlin, from New Castle, to U.S. Army Corps of Engineers (ROTC); Alan Kramer, from Pennsylvania, to Land Acquisition Dept., Indiana State Highway Commission, Indianapolis; George Venditti, from New York, to Rowell & Associates, Surveyors-Planners-Developers, Syracuse, N.Y.; Larry Manship, from Anderson, to American Oil Company (AMOCO), New Orleans, LA.; and Pat Naville, from New Albany with no report on job placement. There have now been 17 graduates in land surveying since the first one graduated in May 1973. There are ten students scheduled to graduate in May 1975 and three more in August 1975 at the end of summer session.



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The Status of Surveying and Mapping Education in the United States of America, 1974

National Report to FIG Commission II
Fourteenth International Congress of Surveyors
Washington, D.C., USA, September 7-16, 1974

ROBERT J. SCHULTZ, P.E. & P.L.S.

Professor of Civil Engineering,
Oregon State University, Corvallis, Oregon
American Congress on Surveying and Mapping

SYNOPSIS 1971-1974

Since 1971, the number of institutions in the United States which offer more than six semester hours of surveying has increased from 135 to approximately 180 and a wide spectrum of programs are now available which span from technician training at the two year level to research training at the doctorate level. Each state in the Union does not have a full range of programs, but some states in regional areas, such as New England, are attempting to pool their resources at one college with many smaller states contributing students.

The National Council of Engineering Examiners has taken the lead in unifying the state land surveying registration policies by producing a one and a half day national common examination. This sets a platform under land surveying licensing at a level greater than field experience. The quasi-field apprenticeship system has died.

Two year surveying technology programs are now expanding to four year programs and a future problem area will arise as some of the four year programs are associated with a Bachelor of Technology degree and some with a Bachelor of Science degree. The question of surveying technical institute graduates, who usually hold technology degrees, becoming registered as professionals, has not been directly addressed by the profession.

At the graduate level, ten universities have active Master of Science and/or Doctor of Philosophy programs which have contributed about one hundred fifty graduates in the period. These graduates are employed in research, teaching, governmental agencies, and as registered professional land surveyors. A recommendation of the Eighth National Surveying Teachers Conference held in June 1974 at Pennsylvania State University - Mont Alto Campus, was that the four year college degree in surveying be the minimum educational level of the registered land surveyor. This 1974 recommendation was below the 1968 recommendation that the first professional degree should be the master's level, consisting of at least five years of university level work. MS and Ph.D. surveying programs have generally over-trained graduates for professional land surveying, but do provide leadership personnel in the research, education, and specialized subareas of surveying.

LAND SURVEYOR REGISTRATION

All fifty states now provide for land surveyor registration. Seven states have separate registration boards for land

surveyors, and forty-three have state boards of engineering examiners which handle the registration of land surveyors as a normal subclassification of engineering.

Thirty-seven states allow only land surveyors to practice land surveying, and thirteen states will allow both registered engineers and land surveyors to practice land surveying. The obvious trend is for land surveyors to be the only people licensed to subdivide land and retrace land boundaries, because of their superior knowledge in these matters. It is here that education enters the picture and formal education is tied to the required educational level of the national professional examination. NCEE now administers for better than twenty states a land surveyor-in-training examination. The current level of this examination is such that a field-trained surveyor will have some degree of difficulty in passing the test on basic fundamentals. The Eighth National Surveying Teachers Conference has called for this examination to be written for a four year surveying college graduate. The immediate future of surveying education is tied to the level of this examination. As more fundamentals are stressed, more examinees will strengthen their backgrounds with a four year surveying degree.

SCIENCE VS. TECHNOLOGY

In olden days surveying was analogous to civil engineering and formal education was cloistered in the rigid civil engineering curriculum. As other elements of civil engineering grew, space for surveying courses was reduced until today the only surveying that civil engineering students are required to take is a brief introduction to the area. This is consistent with most other civil engineering areas, as specialization is obtained at the Master's degree level, and the Bachelor's degree is intended to be broad general training for the undergraduate. Most Bachelor degrees offered in civil engineering have been Bachelor of Science degrees; program accreditation has been monitored by the Engineering Council for Professional Development which has different sets of criteria for different degrees. For engineers they use the Bachelor of Science criterion, which stresses broad professional education, and for technicians they use the Bachelor of Technology criterion, which emphasizes narrow training in a sub-professional area.

As surveying has recently developed its own Bachelor degree programs some schools have used the BT route because of the ease of creating the program within the administrative constraints of the state. Other schools have made a positive engineering stand and use the Bachelor of Science degree. This issue would appear to be academic except that NCEE is attempting by 1979 to give no credit in engineering for BT education because it does not give the broad based education that a professional requires. If surveying is a part of engineering like mechanical, electrical or chemical, it should be accredited by ECPD under the Bachelor of Science criterion,

and schools attempting to establish four year surveying programs should use this generally accepted route to professional recognition.

Some schools which currently have, or are planning, four year surveying programs are: Purdue University, Fresno State College, Oregon Institute of Technology, Bluefield State College, Ferris State College, The Ohio State University, and the University of Florida.

GRADUATE PROGRAMS

Ten Universities listed below have active graduate surveying programs. They are regionally grouped around the Great Lakes and the Pacific Coast areas, which makes it appear that New England, the East, South, Midwest, Rocky Mountains, and Southwestern parts of the United States are not utilizing surveying specialists trained to this high degree of skill. As more four year surveying graduates emerge the demand for the graduate training should increase and steady, continual growth is predicted for this area.

ACSM-FIG-SURVEY OF ACTIVE GRADUATE SURVEYING PROGRAMS IN THE UNITED STATES 71-74

SCHOOLS	Degrees Granted	
	MS	PhD
1. The Ohio State University	52	15
2. Purdue University	32	5
3. University of Wisconsin	16	6
4. University of Washington	15	3
5. Iowa State University	18	-
6. University of California, Berkeley	8	2
7. State University of New York, Syracuse	7	1
8. University of Illinois, Urbana-Champaign	5	3
9. Cornell University	3	5
10. Oregon State University	2	-
Subtotals	158	40
Yearly Ave.	53	13

TWO YEAR TECHNOLOGY PROGRAMS

Many surveying positions are filled by non-professional personnel who need special training to perform their job at a higher than craft skill level, but below the professional. These jobs are being filled by graduates trained in the two year technology programs and they have replaced the experience-only personnel. The quality of these two year people appears to be excellent and many of them can still, by additional continual education, enter the professional field. This speaks highly of their training, but it should not be considered the ideal route to the professional arena.

Some two year schools are over-training their graduates because they are the only schools in the area teaching surveying. Many are currently considering four year programs as expansions of the two year technology programs and the science vs. technology problem arises. American youth appear to reject the four year technology concept unless they can obtain registration. If registration is the goal of a young person entering the field, then he should obtain the Bachelor of Science degree, as this is the recognized traditional route and probably will remain so for the immediate future.

Highlights of ISPLS Board of Directors' Meeting

One of the main items discussed at recent Board of Directors meetings was the problem brought up at the Annual Meeting regarding County Surveyors engaging in private practice. At the February meeting of the Board the following resolution was adopted: "...there be established an ISPLS-CSA (County Surveyors Association) Joint Committee to work toward a common position regarding any areas of conflict... relative to duties, responsibilities, and ethics regarding the office of the County Surveyor..."

Also, the Board established a new dues structure with dues now being \$30 for Members and Associates; \$15.00 for Junior Members; \$5.00 for Student Members. The dues for Sustaining Members will remain at \$100.00 per year. Committee appointments were discussed and should be announced shortly.

In other action, the Board voted to hold the 1976 Annual Convention at Stouffer's Indianapolis Inn on January 29-31, 1976. Local chapters, it was reported, are increasing in activities, and new ones will possibly be formed. Also, a petition for the Purdue University Student Chapter was accepted.

The next meeting of the ISPLS Board of Directors will be April 11, 1975, at 1:30 p.m. at 111 N. Capitol, Indianapolis.

FUTURE MEETINGS OF INTEREST TO LAND SURVEYORS

March 9-14, 1975

ACSM-ASP Annual Spring Convention,
Washington Hilton Hotel, Washington, D.C.

April 14-17, 1975

North American Conference on Modernization of
Land Data Systems, Marriott Twin Bridges
Motor Hotel, Washington, D.C.

"THE EDITOR SPEAKS"

It was with mixed emotions that I accepted the "Certificate of Appreciation for Outstanding and Dedicated Service" from ISPLS at the Annual banquet in January. Mixed emotions because I do appreciate the recognition and am grateful to those responsible, but somewhat sad, I suppose, because I realize that my participation in the intimate affairs of the Society will be curtailed in the future. I do plan to continue working on the newsletter and will attempt to make it a real contribution to the profession of land surveying in Indiana and one in which we can be justly proud.

In the past twenty years we have witnessed significant changes in our profession which have affected all of us. Years of frustration in attempting to upgrade land surveying in terms of registration, ethical practice, education, and technical competence are gradually ending in success. Much has been accomplished, but much remains to be done! We cannot rest!

The decision to retain professional management services and establish Society headquarters in Indianapolis was long overdue and is an absolute necessity. We could no longer depend on purely volunteer help to conduct the affairs of the Society. Already we have seen some significant results. The recent Annual Meeting in Indianapolis was a great success. Regular board meetings are being held bimonthly. Summer workshops are being conducted at sites all across the State. Continuing education units are being proposed to be used in recording the



attainment of professional development units. Local chapters are becoming active in several areas of the State. An active legislative program is underway. Public relations and "image development" are receiving much attention.

All this requires financial backing and we must all support these activities with our encouragement, our dues and our involvement. The Society is in good hands and great times are ahead of us!

Kenneth S. Curtis

SUSTAINING MEMBERS

The following are sustaining members of the Indiana Society of Professional Land Surveyors. The Society appreciates their continued participation and encourages your support of these firms.

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"CAPITOL COMMENTS"

"Unsettled" might well be the appropriate term for activity in the 1975 Indiana General Assembly. With the Senate being controlled by the Republicans and the House by the Democrats, both houses have been "doing their own thing" so to speak, one having little interest in the other.

This session can boast a record number of bills (in excess of 1700) plus numerous resolutions. Frankly, most of us were unaware that the State was so bad off to require the introduction of so much legislation. But, after the Legislature has worked its will, we can probably anticipate some 300 plus measures being enacted into law.

In terms of those bills of interest to ISPLS, SB 445 (Duvall-Benjamin) was heard on February 18, by the sub-committee of Public Policy and was favorably acted upon. This bill provides civil immunity for members and employees of licensing boards and commissions (including the Engineers and Land Surveyors Registration Board) while engaged in official duties. In addition,

immunity is also extended to witnesses. We are hopeful that this legislation will be passed, as the various boards and commissions can function properly in the investigation of ethics problems which continue to plague most professions. At this writing the bill is still to be heard by the full Committee.

HB 1905 (Freuchtenicht) was heard by the House Judiciary Committee the week of February 10 but action was postponed due to technical difficulties in the wording. The bill, which would prevent the granting of title to real estate which is not all of the grantor's original tract without recording of plat in subdivision book of the county recorder or providing a drawing of the parcel conveyed, drew criticism from various members of the Committee because of drafting problems. After attempting to correct the language of the bill, it was reconsidered by the Committee on February 20 but was defeated.

It appears at this point that, perhaps, the best legislation to come out of this Legislature would



Thomas V. McComb,
Executive Secretary

be no legislation. The spirit of cooperation is lacking and, as a result, so is the output. In conclusion, your staff is attempting to stay on top of various pieces of legislation affecting the surveying profession. If you have questions on any proposed measure before the House or Senate, don't hesitate to contact us.

Enhancing the Status of Surveying

Elevating the professional status of land surveyors was the direction set recently by the 8th National Surveying Teachers Conference. The conference, an activity of the Civil Engineering Division, was held June 9-13, 1974 at the Mont Alto Campus of The Pennsylvania State University. About 110 people attended.

A Resolutions Committee developed a series of proposed recommendations which were passed in the following form.

.. It is recommended that the minimum education level of the registered land surveyor be equivalent to a four-year college degree in surveying.

.. It is recommended that an accreditation policy or guidelines for surveying programs be developed as an aid to surveying teachers in planning and evaluation of programs.

.. It is recommended that the

integrated regional approach to the establishment of professional and technical programs in surveying, such as that of the Federation of New England Surveyors' Associations, be studied carefully, and used where appropriate as a model for similar efforts in other parts of the nation.

.. It is recommended further that a transmittal letter be sent immediately by the 1974 Conference Chairman to the Federation of New England Surveyors' Associations, containing the following endorsement:

"The participants of the 8th National Surveying Teachers Conference endorse and support the regional approach and methods of the New England Federation of Surveyors' Associations in their effort to establish professional and technical programs in surveying for the six New England States."

.. It is recommended that some

form of professional development, such as continuing education, be a requirement for maintaining registration in land surveying.

.. It is recommended that a separate Division of ASEE be created which would be called the Surveying Division.

.. It is recommended that the conference committee for the 1977 meeting seek the support and co-sponsorship of not only ASEE, but also of ACSM, ASP, ASCE, and CIS.

In addition to passing the above recommendations, the conferees voted to accept the invitation of the University of New Brunswick to hold the 1977 Conference at its campus. The chairman for that meeting will be Angus C. Hamilton, chairman of the Surveying Engineering Department at U.N.B.

Reprint from Engineering Education News, A.S.E.E., September 1974.

"1975 ANNUAL CONVENTION"

The 1975 Annual Convention of the Indiana Society of Professional Land Surveyors, Inc., is history! Approximately 220 members and wives gathered at Stouffer's Indianapolis Inn on January 23-25, and participated in a series of interesting and entertaining sessions. ISPLS was fortunate to obtain the services of some of the finest speakers who presented very good programs on timely subjects.

This year's meeting also included a series of ladies' programs and activities which were well received. As this was the first Annual Convention held in Indianapolis, some minor problems were encountered. However, the overall feeling was that the 1975 Convention was very successful. ISPLS, also, was pleased to have the participation of 20 commercial exhibitors, as this was a very popular portion of the Convention.

The staff of ISPLS has received many favorable comments regarding subject matter of workshops and general sessions. However, plans are already underway to make the 1976 Annual Convention even better. Please feel free to offer suggestions you might have for the 1976 meeting to the Board of Directors or the Executive Secretary.

We hope to see you at Stouffer's Indianapolis Inn on January 29-31, for a great 1976 Annual Convention.

GENERAL SESSION SPEAKERS



MR. HOWARD WIESEN, INDIANA DIVISION OF LABOR "OSHA REPORT"



MR. NIVEN STALL, INDIANAPOLIS ATTORNEY, "DESCRIPTION WRITING"



PROFESSOR DAVID BLYTHE, UNIVERSITY OF KENTUCKY, "RE-CERTIFICATION"

LADIES PROGRAM



LADIES PROGRAM SATURDAY BREAKFAST - RUBY ALLEN, GRAPHOANALYST



MR. JOHNSON OF HARRISON MARKERS, DISPLAYS THE MARKERS DECORATED BY ISPLS WIVES.



CENTRAL INDIANA CHAPTER WIVES MANNED THE REGISTRATION DESK.



WORKSHOPS AND GENERAL SESSIONS WERE WELL ATTENDED



CAPT. SAM BAKER, DIR. NATIONAL GEODETIC SURVEY, "CONTROL SURVEYS FOR URBAN AREAS"



REPRESENTATIVE RICHARD WATHEN, R-JEFFERSONVILLE, "INDIANA-KENTUCKY BOUNDARY"



FRIDAY LUNCHEON



FRIDAY LUNCHEON SPEAKER LARRY CONRAD, SECRETARY OF STATE



A SAMPLE OF EXHIBITORS



Recommended Right-of-Way Practices

NOTE:
First of a two-part series.

Responding to a survey of ASCE's Land Surveying Committee, more than 90 agencies, primarily state highway departments and utilities, reported their land surveying practices in right-of-way work. Most agencies reporting need "considerable improvement" in these practices. Improved techniques and procedures are recommended in such areas as platting of right-of-way, upgrading monumentation and improved land surveying procedures.

Past land acquisition and description practices of public and private right-of-way acquiring agencies have left land owners with indeterminate and inaccurate land boundaries. In this day of increasing land costs, stricter interpretation of deed descriptions, larger urban developments and more governmental control of land use, these past practices are no longer tolerable. Modern land surveying technology and computers make economically feasible new and vastly improved methods for right-of-way acquisition.

Recommended procedures for acquiring new right-of-way are:

- Perform an accurate land survey of the right-of-way being acquired;
- Prepare good and complete legal descriptions;
- Install sufficient permanent accessible monuments so that subsequent land surveyors can locate the right-of-way on the ground;
- Prepare a land division plat or certificate of survey drawing, which shows clearly where the land taken is located. This drawing must be filed in a local public land office where it is available for use by all land surveyors.

Agencies questioned

In January 1968, Executive Secretary William H. Wisely sent a letter to highway departments, public utilities, pipeline companies and government agencies to determine what their land-surveying practices for right-of-way acquisition were. Analysis of the replies indicates an urgent need for much improvement. The data shows that rights-of-way are usually not properly surveyed. Agencies are claiming possession by position of the improvement on the ground rather than by the wording of

land titles of record. Descriptions are poorly prepared, often by persons not familiar with land surveying procedures. Monuments, if any, are not carefully placed under a qualified land surveyor's direction. Plats or drawings are not filed in a public place in the county court house. State plane coordinates are seldom used for supplemental position location.

These poor procedures confound adjacent landowners. Adjacent properties cannot be accurately surveyed or described for sale or use. Adjacent landowners pay a high price for surveys and legal work when making an ownership transfer or platting for land improvement. Litigation sometimes develops with consequent expense for both the holder of right-of-way and the adjoining land owner. One northern state highway department reported that legal and surveying costs to clear up title problems on a tract of land cost many times the amount of the original land purchase.

Sometimes, as a result of such problems, improvements constructed must be destroyed or moved at great expense to all involved. Transfer of title, construction-work or land development is very often delayed—sometimes for years—while awaiting decisions. Such delays could have been minimized had proper land surveying methods been used when the right-of-way was obtained. More frequently, the new owner of right-of-way is held legally responsible for damages to the adjoiner if he has not performed a good land survey of the right-of-way, has not properly monumented it on the ground and filed a proper plat accessible to the public. Wherever ownership is questionable, title companies will not insure land title and financial institutions will not lend money. In many cases the agency has found it costly to purchase added right-of-way due to lack of proper land surveying work when the first taking was made.

Questionnaire on right-of-way practices

In 1967 the Land Surveying Committee of the Surveying and Mapping Division of ASCE developed a two-page statement and questionnaire entitled "Recoverable Boundaries for Rights-of-way." This document was transmitted to all U.S. state highway departments, 13 federal agencies, 94 electric and telephone utilities, 36 members of the American Right-of-Way Associa-

tion, 17 pipeline companies and other interested individuals.

The statement pointed out problems licensed land surveyors were having in locating the boundaries of rights-of-way. It pointed out the need for clearly described and recoverable boundaries with adjoining lands. It pointed out the problems created by land takings which leave indeterminacies or substantial difficulties in the physical recovery of right-of-way lines. Also enclosed was a resume made in 1965 by the late Professor Win Eldridge, covering manuals and practices of all state highway departments as reflected in their written instructions regarding right-of-way surveys, monumentation and legal descriptions.

ASCE asked each agency contacted to review its current practices, make such changes as seemed appropriate and transmit its comments and suggestions to the committee. Results were received throughout 1968 and 1969 from forty state and two county highway departments, forty-one electric, telephone and pipeline firms and eleven state and federal agencies. Some agencies sent back very detailed data on the work they were doing including copies of manuals of practice, drawings of land acquisitions, subdivision plats, sample descriptions and other information. Others replied with very brief letters with little or no information which could be used to judge how well they were following proper land surveying methods in obtaining right-of-way. The survey itself stimulated greater awareness of right-of-way acquisition problems and brought many improvements.

Answers received

The Land Surveying Committee's

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APRIL 1972

summary of replies is the basis for the recommendations presented (see box). To summarize: only eight highway departments, four electric, telephone and pipeline utilities and none of the federal and state governmental agencies were judged to have fairly acceptable land surveying practices in right-of-way work. Most highway departments and over half of the utility companies and other government agencies were judged to need considerable improvement in their practices. Four highway departments, fifteen utility companies and three other government agencies were considered to have very poor practices.

Only a few organizations had good manuals on how to perform survey work. About half of the agencies did have some type of manual, but many had inadequate guidelines or no instructions at all. The majority of the agencies survey boundaries, but few appear to be properly performed from a land-surveying standpoint. The old way of defining right-of-way by physical possession and occupation seems to be going out of favor (33 ft left and right of centerline as occupied for some roads). In most cases today actual fee title or easement is used to acquire right-of-way. Occupation is not a recommended basis for title purposes due to lack of definition and lack of permanence of the centerline location.

In all but a few cases, legal descriptions submitted were much below the standards expected of licensed land surveyors. It is evident that qualified land surveyors need to be employed in this work as in other phases of right-of-way acquisition.

Review of monumentation practices disclosed that qualified land surveyors must be employed in setting monuments, and markers must be much more permanent and more accessible to the land surveyor. Some agencies even have monuments placed by construction contractors or other unqualified personnel! Very few indicated proper reference of monuments to local property corners or state plane coordinate control.

Many utility companies are obtaining right-of-way by means of blanket or poorly worded descriptions, such as, "A 50-foot wide strip of land in the SE-¼ of the NE-¼ of Section 12." Such descriptions do not give the reader any idea where the right-of-way is actually placed on the ground. Some firms and agencies use both blanket and metes-and-bounds methods of description.

The implication is that the cheaper method is used where they can get by with it. Very few agencies file plats or drawings of their rights-of-way in county or parish courthouses where the adjoining landowner, his attorney and land surveyor can have access to this document. A few more have such drawings in their own offices but these often are not convenient to study and in some cases have never even been prepared. Centerline monumentation has been used as a method of defining older highway locations as well as public utilities. The questionnaire results indicate that there is a definite trend toward monumentation of sides of rights-of-way, especially for heavily-travelled roadways. State plane coordinates are used by a number of highway departments but by very few of the other agencies. Aerial photographs were used by some on property work.

Conclusions

Since the first review of highway practices was made in 1965 and especially since the 1968 questionnaire, a number of highway departments, electric companies, telephone companies, pipeline companies and governmental agencies have taken steps to upgrade their practices. The Minnesota Department of Highways, for example, has a research program in surveying with the University of Minnesota and recently instituted an intensive two-year training and education program for land surveyors. This program is pointed toward platting of right-of-way, upgrading the monumentation of right-of-way, improving land surveying procedures and implementing of modern surveying with new equipment and technology.

It is urged that such programs be jointly sponsored by highway departments, utilities and government agencies on a national basis in order to raise our standards and to encourage more land surveying instruction in the universities.

Public agencies and utilities have in the past shown a lack of concern and care for proper land surveying. These agencies have a duty to the public, implied in their right of eminent domain, to exercise much greater regard for the rights and welfare of the people through whose lands they are passing. It is not fair or just to prevent a land owner from the full and free use of his land nor to deny him the right of knowing where the right-of-way is located on the ground.

Recommended Procedures

Policy

Each agency that acquires right-of-way should adopt a general policy which requires that all rights-of-way be surveyed, located in the field, permanently monumented and properly described and recorded in accordance with the procedures listed below. Federal and state agencies should take the lead in requiring such practices of their own organizations. County and local governmental agencies should follow the lead of the states. Public and private utility companies and pipeline firms should, for their own good public image and to avoid costly litigation, take steps to improve their practices in all new right-of-way work. All agencies should set up a program of reexamining past acquisitions in order to bring them up to recommended standards as soon as possible.

Land survey work

Right-of-way surveys should be carefully performed to accurately locate the land taken on the ground with respect to adjoining property lines. This work should be performed under the jurisdiction of and direct supervision of a state licensed land surveyor. All work should be done with electronic survey equipment and 1-second theodolites to at least second order accuracy of position points found and established. Traverses shall be mathematically closed and adjusted. Complete restoration of all adjoining land lines will not usually be necessary. Section Lines, Quarter-Section Lines, subdivision plat lines and old control base lines should generally be located. State plane coordinate ties should be used wherever possible.

Monumentation

Existing monuments within the construction area should be located, identified, preserved, referenced and eventually replaced or referenced in by new supplemental monuments to protect property rights which could be harmed by destruction of valuable land ties during construction.

Agency surveyors should set permanent monuments at all changes in direction on each side of the right-of-way. In urban areas monuments should be set at all key intersection points and at least every 1/4-mi (0.4-km). In rural areas monuments should be set at all key intersection points and at least every 1/2-mi (0.8-

km). In special areas of low land value where large land holdings adjoin the right-of-way, change in direction points may suffice. Monuments shall be a permanent type with flanges and induced magnetism. In unstable soil or rock, special types of monuments should be set. Further research and study needs to be conducted on this topic. Monuments shall be placed in such a manner with respect to fences, roadways, etc. that they may be accessible to the private land surveyor working on adjoining property with no need to enter the centerline or median strip of highways or public utility property.

Descriptions

Legal descriptions shall be based on adjusted traverse courses and bearings. All such descriptions shall be prepared or reviewed, by a properly qualified state licensed land surveyor. Descriptions shall have adequate reference to adjoining land lines to enable any subsequent surveyor or attorney to retrace the work of the original right-of-way surveyor. Existing blanket, centerline and other loosely described rights-of-way should be transformed into modern, properly described documents as soon as possible. Supplemental state plane coordinate data should be included wherever available and permitted by law. S.I. units of measurement should be included in all new legal descriptions and drawings.

Platting

An accurate, scaled drawing of the lands being taken should accompany every right-of-way description. This document should in general conform to standards for land subdivision plats in the locality. Right-of-way plats should be prepared and filed, especially for complicated interchanges and land acquired in urban areas. Adjacent land lines, natural and man-made topographic features, key base lines, supplemental state plane coordinate data and other dimensional information should be shown only in sufficient detail to identify the parcel of land taken. All distances shall be shown to 1/100-ft (0.3-cm) and to one second (0.002 G) adjustment.

Records

The local county or parish courthouse office which registers and files deeds on land should be given a permanent cloth or plastic-backed copy of the plat for recording in their offi-

cial permanent records. A reproducible print on linen or cloth should also be filed for each of the above plats in order to facilitate local reproduction of these documents. This is a service to the public which should be given in exchange for the right to enter upon and take possession of the citizens' land.

Manual of instructions and procedures

Each agency should examine its present manuals and methods of implementing the above recommendations. It is strongly urged that local land surveyor associations, right-of-way associations and real property sections of the bar be asked to participate in revision of these documents. Manuals should be prepared for work by staff land surveyors, consultant land surveyors and others.

Staff

Every right-of-way acquiring agency should have a state-licensed land surveyor in a responsible position to determine policy on land surveying matters. This person would be a full-time employee for larger organizations and a consultant for smaller agencies. It is urgent that proper staff recognition be given to this important phase of work. Neglect of these matters has created a very serious situation for many landowners.

Research

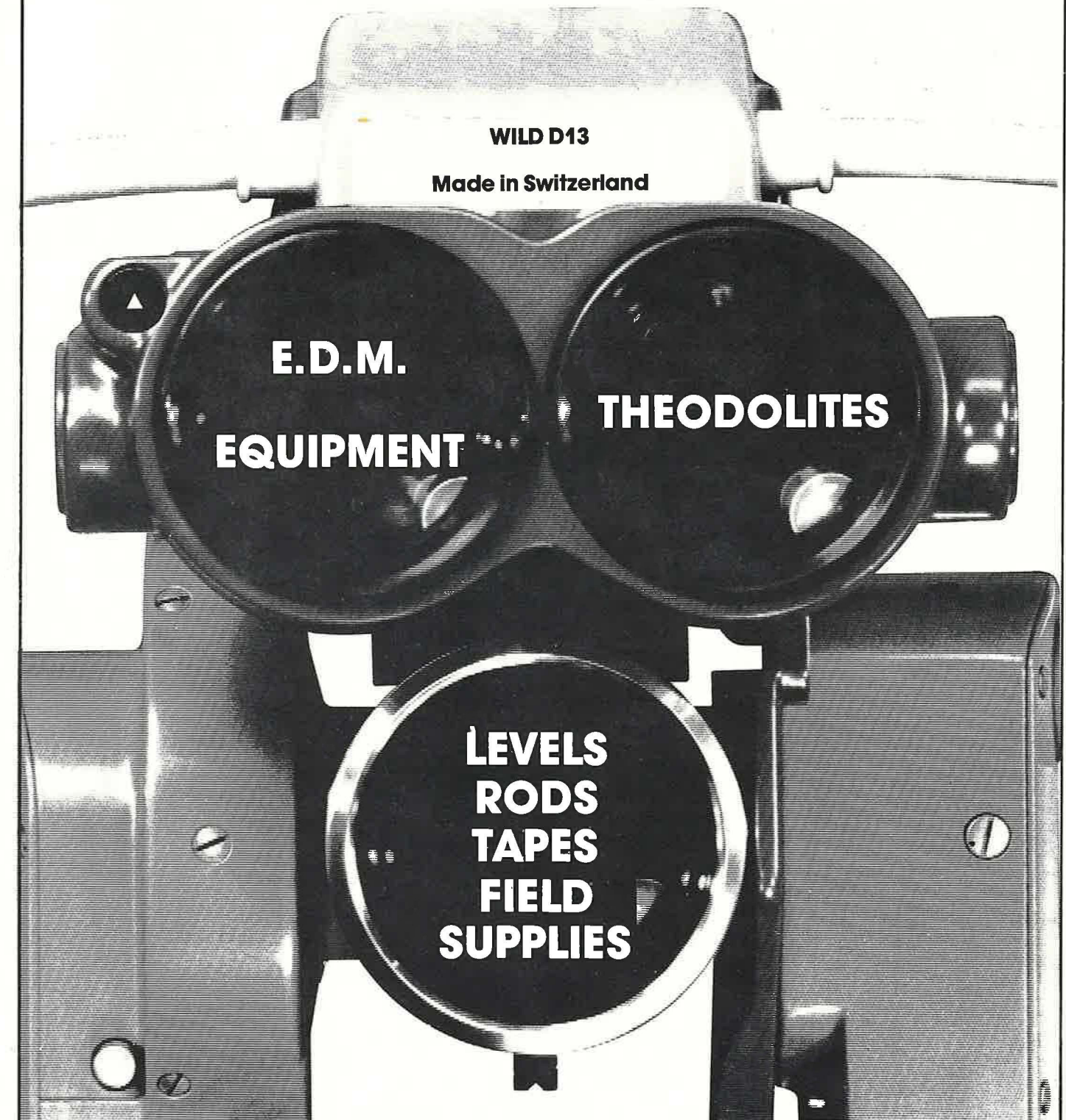
Cooperative research studies on the best methods of implementing these recommendations on a national and a local level should be negotiated with universities that have recognized and qualified instruction in land surveying. Studies of ways and means to place better and more permanent monuments are needed. Studies on how to computerize and improve present practices are needed. A by-product will be the encouragement of much needed undergraduate and graduate level university work in this—the oldest branch of civil engineering.

Seminars

Joint seminars and study groups should be organized on the local level so that right-of-way specialists, attorneys, engineers and land surveyors can discuss their individual and mutual problems. Much of the current neglect of proper land surveying procedures is due to lack of awareness that these problems even exist!

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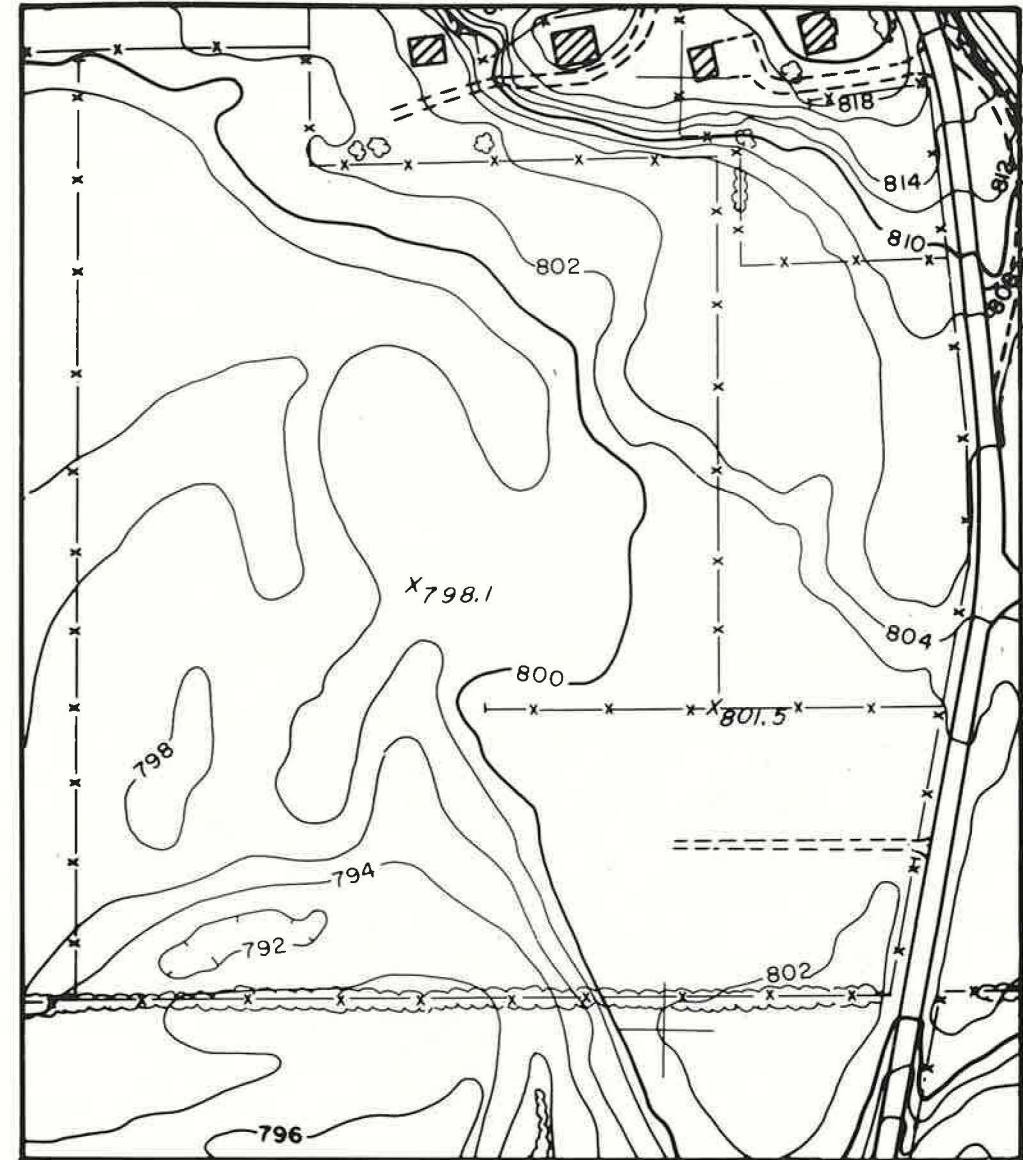
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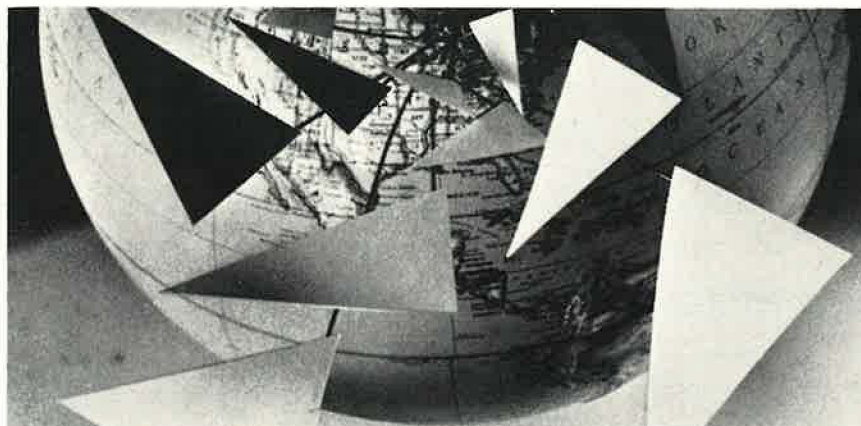
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