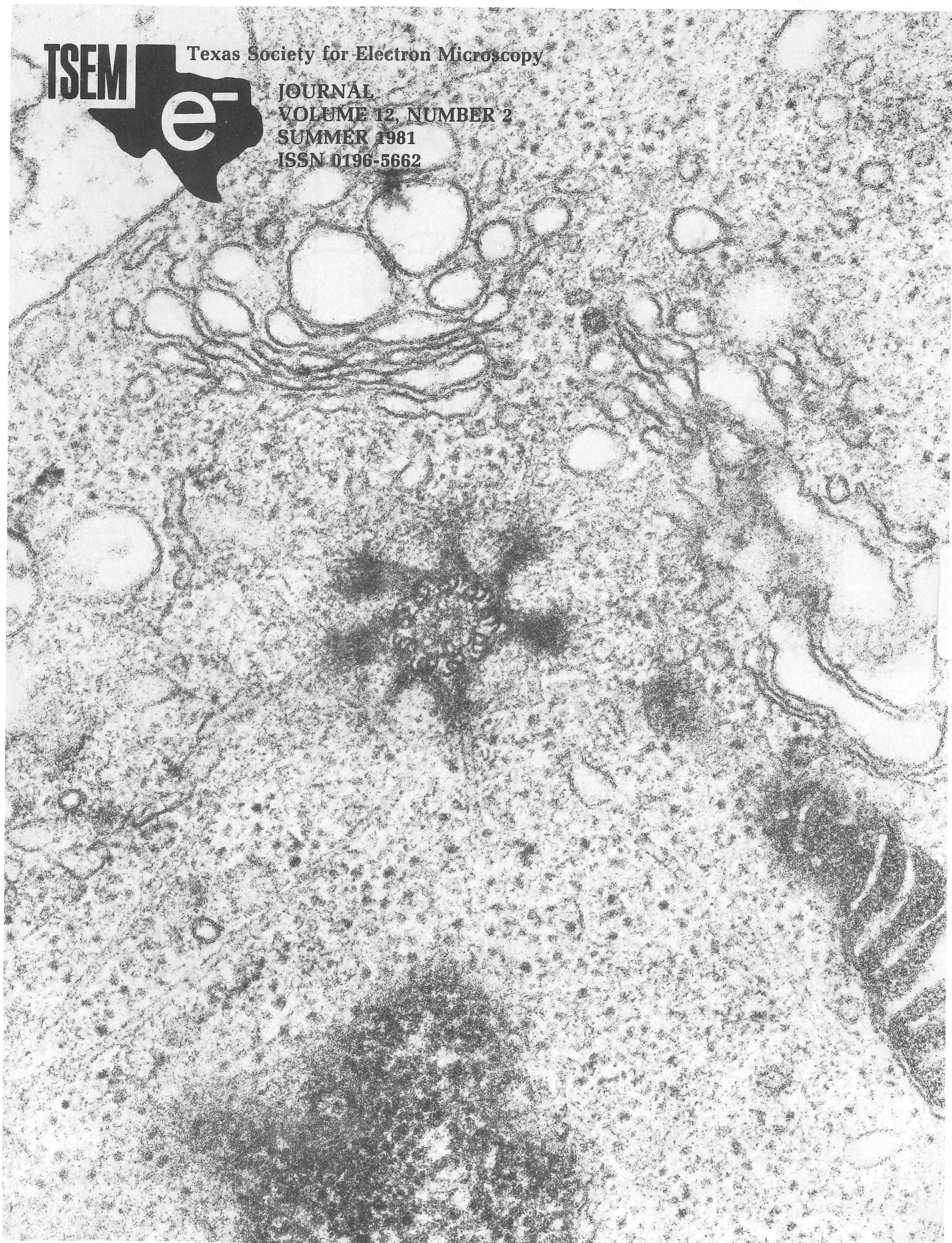


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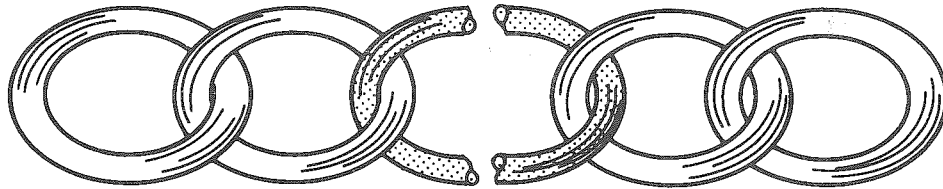


Texas Society for Electron Microscopy

JOURNAL
VOLUME 12, NUMBER 2
SUMMER 1981
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Contents

**Volume 12, Number 2
Summer, 1981
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EDITORIAL POLICY

Feature articles, news, letters to the editor, and micrographs may be submitted. Feature articles should be 3-10 typewritten pages, double spaced, with figures, tables and electron micrographs mounted for an 8-1/2x11 inch format. Three types of articles are solicited: 1) reviews 2) research reports 3) techniques papers. Reviews provide background material on a given research problem and often are condensed versions of review sections from current grant proposals. Research reports are short summaries of work published in part or in full in other journals but presented for a diverse audience with an interest in electron microscopy and allied technical approaches. Techniques papers describe new or rediscovered methods for improving or adding to existing techniques and give examples of the results obtained with these methods.

News items should be submitted through the regional editor in your area and conform to the standard format used by the regional editors. Letters to the editor are printed as they are received in the order of their arrival. These letters reflect the opinion of the individual members and do not necessarily reflect the opinions of the editor or the society. Electron micrographs to be used for cover photos are welcome and should be selected with some attention to aesthetic appeal as well as excellence both in technique and in scientific information content.

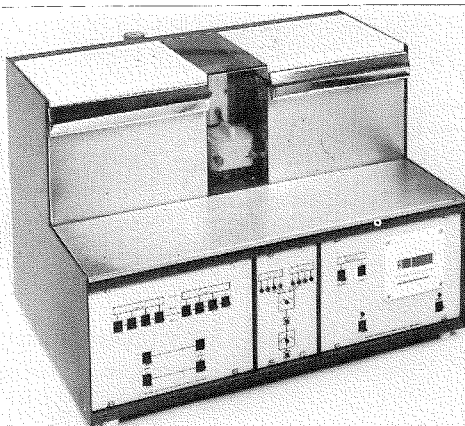
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Electron micrograph courtesy of Dr. W. Allen Shannon, Jr., Veterans Administration Medical Center and Department of Cell Biology at the University of Texas Health Science Center at Dallas.

Electron micrograph of normal human lymphocyte from peripheral circulation demonstrating prominent cross section centriolar profile with pericentriolar satellites and attached microtubules x 88,400.

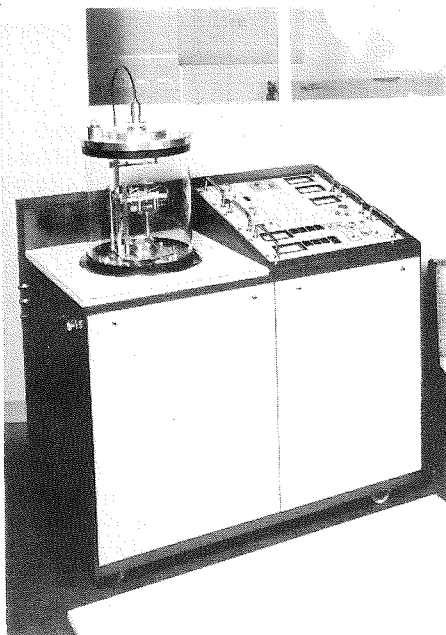


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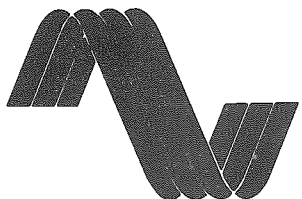
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President's Message

As we begin a new year it is good to look back once before we look ahead to the future. Since 1965 we as biologists and physical scientists have met regularly for the purpose of sharing research with the electron microscope. We have had three types of members — regular, corporate and student. Without any one of these our society would not have grown as it has. Our goal remains the same but we have planned some new activities in response to the changing needs of our members and the rapid growth of all fields involving electron microscopy.

The meeting in Ft. Worth was really a good one. If you were not able to attend, be sure to look at the abstracts in the TSEM Journal. Our thanks to TCU for their generous support of our Ft. Worth meeting.

Our October meeting (October 9-11) is a joint meeting with the Texas Chapter of the Biological Photographers Association. We will meet in beautiful Corpus Christi at the Emerald Beach Holiday Inn. The theme of the meeting will be photography as science and art. Our featured speaker will be Dr. Bill Hardy (sponsored by E.G.&G. Ortec and JEOL, USA, Inc.) who will talk about a electron image digitalization and all the new trends in image enhancement and storage, etc. We will have a light microscopy workshop and a macrophotography workshop. Plan to attend and present your science that you think has great visual appeal as well. The TSEM Journal Editor will be publish-

ing a collection of outstanding electron micrographs that will reflect the highlights of this meeting in the next issue. So be sure to send a photograph to her at the time you submit an abstract. On the lighter side we have planned exhibits from the photographers, a speaker from Texas Parks and Wildlife and on Sunday a field trip in the Bay area by a biologist, Dr. Frank Fisher from Rice University, who knows this area very well. Come and bring your kids.

Our second meeting will be April 1-3, 1982 at TWU in Denton. Our wonderful student members will be featured at this meeting, so mark the date on your calendar.

I look forward to seeing each of you at the meetings this fall and next spring. Keep up the good work and tell a friend about TSEM.

Sincerely,

Ann Goldstein, Ph.D.
Associate Professor
Baylor College of Medicine
President, TSEM

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Cheryl Craft has agreed to serve as associate editor. She will be glad to work with you on material you wish to submit.

Additional regional editors have been appointed. You will

want to work with these people to disseminate information about the work at your institution.

Your helpfulness and cooperation is greatly appreciated.

Sincerely,

Elaine McCoy
Editor

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INTERRELATIONSHIPS OF CYTOPLASMIC TUBULAR STRUCTURES IN CIRCULATING LYMPHOCYTES

By
W. Allen Shannon, Jr.

Veterans Administration Medical Center and
Department of Cell Biology

The University of Texas
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W. Allen Shannon, Jr., M.A., Ph.D.
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In most normal lymphocytes, the only tubular structures observed in the electron microscope are microtubules and centrioles (Figs. 1 and 2). Both microtubules and centriole individual tubules measure 17-28 nm in diameter in our preparations fixed with a combination glutaraldehyde-osmium tetroxide fixative(1). However, other tubular structures and virus-like inclusions have been reported in lymphocytes from normal individuals(2-5).

Fine structural analyses of peripheral blood lymphocytes from normal subjects and a number of pathological conditions have revealed the presence of various membrane-bound cytoplasmic inclusions(2-13). The characteristic types have been referred to as: 1) tubular polygonal (tubulopolygonal) inclusions (TPI), also called parallel tubular arrays (Figs. 3, 4A and 4B), 2) tubular reticular (tubuloreticular) inclusions (TRI) (Figs. 3 and 4B), and 3) spherical virus-like inclusions (VLI) (Figs. 3, 4A and 4C). In some instances, TRI have also been referred to as virus-like inclusions. VLI and TPI have been reported in normal lymphocytes (2-5).

We have surveyed peripheral blood lymphocytes to determine the presence of anomalous structures reflecting the pathophysiology of a mitochondrial myopathy variously referred to as Kearns-Shy syndrome, ophthalmoplegia plus, or oculocraniosomatic neuromuscular disease with ragged red fibers and some others. The disease is thought to be of familial rather than viral etiology although it has not been proven so. To our surprise, the lymphocytes of these patients reflect an incidence of the aforementioned inclusions to a degree not seen in any other pathological condition of which we are aware. In addition, morphological associations are evident which indicate specific interrelationships among the three inclusions.

The first of these inclusions, TPI, consists of parallel arrays of stacked tubules (Figs. 3, 4A and 4B). The tubules are approximately 25 nm in diameter with 7.5 nm electron dense areas separated by 10 nm spaces. En face profiles present a parallel stacked array of tubules which gives a honeycomb appearance. Similar inclusions, TRI, consist more or less as a reticulum of nonoriented tubular-like elements (Figs. 3 and 4B). The structural dimensions correspond closely to those of the TPI — 20-40 nm. The third type, VLI, measure approximately 40-60 nm in diameter with most in the 40 nm range, and are spherical (Figs. 3, 4A and 4B). Although the latter appear to be virus-like particles, there is currently no direct proof of a viral nature. We have also observed apparently anomalous disarrangements of microtubules in lymphocytes from subjects with muscular dystrophy (Fig. 4C). These may relate to the presence of spherical structures containing tubulin in human dystrophic lymphocytes (14).

While TRI have been reported to be viral-associated based solely on morphological data, conclusive data have not been presented to prove that TRI are viral or viral-associated. TRI have been postulated to be a unique infectious agent manifested in response to immunologic stimuli (6). Evidence for this stems from the presence of TRI in tissues from patients with immunologically active conditions, e.g., systemic and discoid lupus erythematosus, myasthenia gravis, chronic hepatitis and others (15). Although similarities in structure exist, the pathogenesis of TPI and TRI, individually, is apparently different. The frequency of occurrence of TRI in viral or immunologic-associated diseases and the presence of TPI in most normal and pathological conditions (3) may indicate a direct relationship between TRI and TPI. The TPI-containing lymphocytes have represented up to 67% of peripheral lymphocytes observed in either Kearns-Shy syndrome

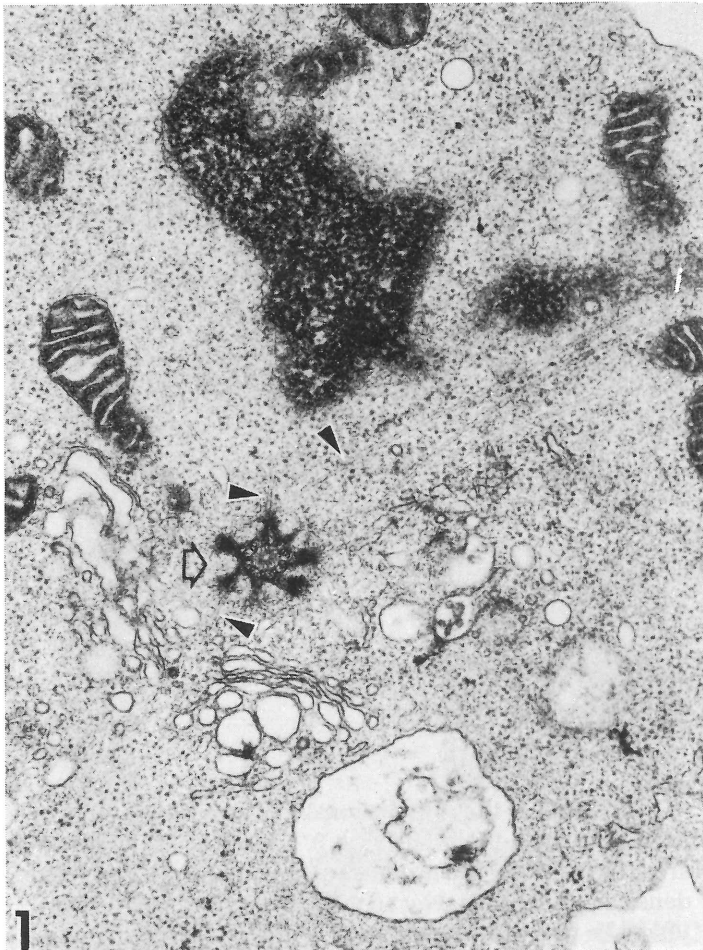


FIGURE 1. Normal human lymphocyte. Cross-section through a centriole (arrow) with associated microtubules (arrowheads). x 19,100.

(subject n=3) or nonassociated disorders (n=15) (12,13). TRI represented 13% and 33% and VLI, 53% and 67%, respectively. None of the normal subjects studied (n=6) exhibited TRI or TPI. Contrarywise to our findings for TPI, it is interesting that when lymphopenia has been induced by steroid administration in normal subjects, there is an increase in the number of cells containing TPI and not in the number of TPI per cell (5). This indicates 1) that TPI-containing lymphocytes are a distinct population of lymphocytes, and 2) that the steroid-induced and Kearns-Shy syndrome phenomena result via different mechanisms although within the same suppopulation.

The described inclusions have been observed in various intimate associations, i.e., VLI with TPI (Fig. 4A) or with TRI, and TPI with TRI (Fig. 4B). All three of the inclusions have been observed in close association within the same vacuolar complex (Fig. 4B). In addition, cytoplasmic inclusions appearing the same as VLI are commonly adjacent to the vacuoles containing VLI (Figs. 4A

and 4B). Although the tubular inclusions and the smaller VLI measure in the same range as microtubules and centriole tubules, no definite association with microtubules per se or centrioles has been observed.

TPI and TRI are morphologically similar and may be directly related to each other and to VLI in normal individuals and patients with various diseases. Peripheral blood lymphocytes from Kearns-Shy syndrome patients provide a unique model for the study of lymphocyte tubular inclusion interaction without the influence of steroids. The origin, function, and biochemistry of the inclusions are not known. They may reflect either an alteration of normal cellular constituents, e.g., microtubules, or response to immunologic disease, senescence or other changes in cellular function. Their identification in a variety of diseases so far without quantitative or qualitative distinction limits at present their diagnostic usefulness.

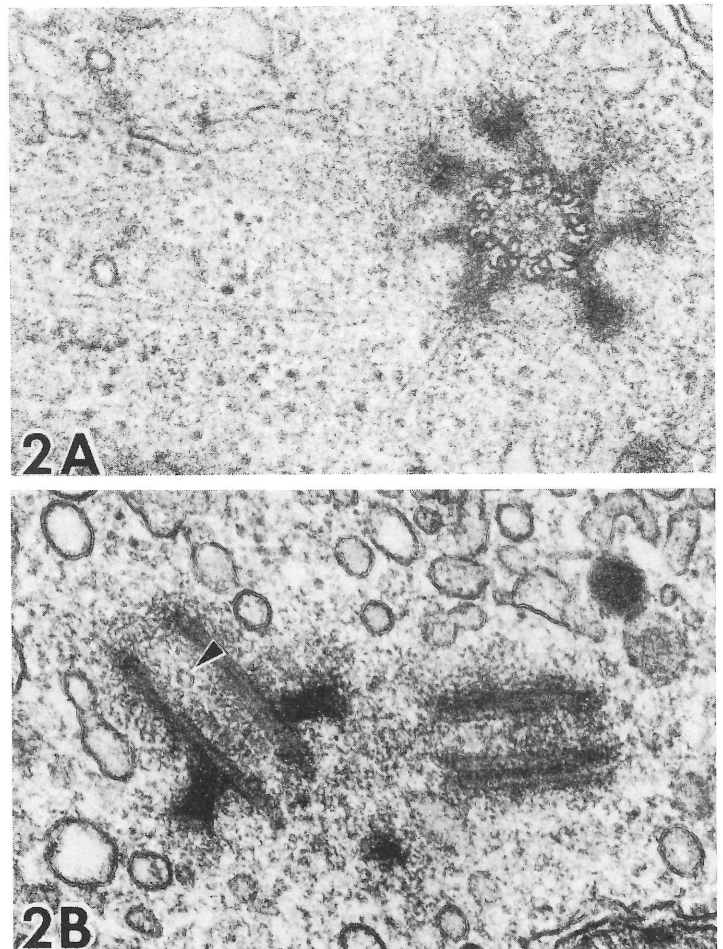


FIGURE 2. Enlarged views of centrioles in normal human lymphocytes. x 68,000. A. Cross-section profile with pericentriolar satellites (densities) and attached microtubules. B. Transverse section profiles with pericentriolar densities. Membrane vesicle (arrowhead) can be seen within one centriole.

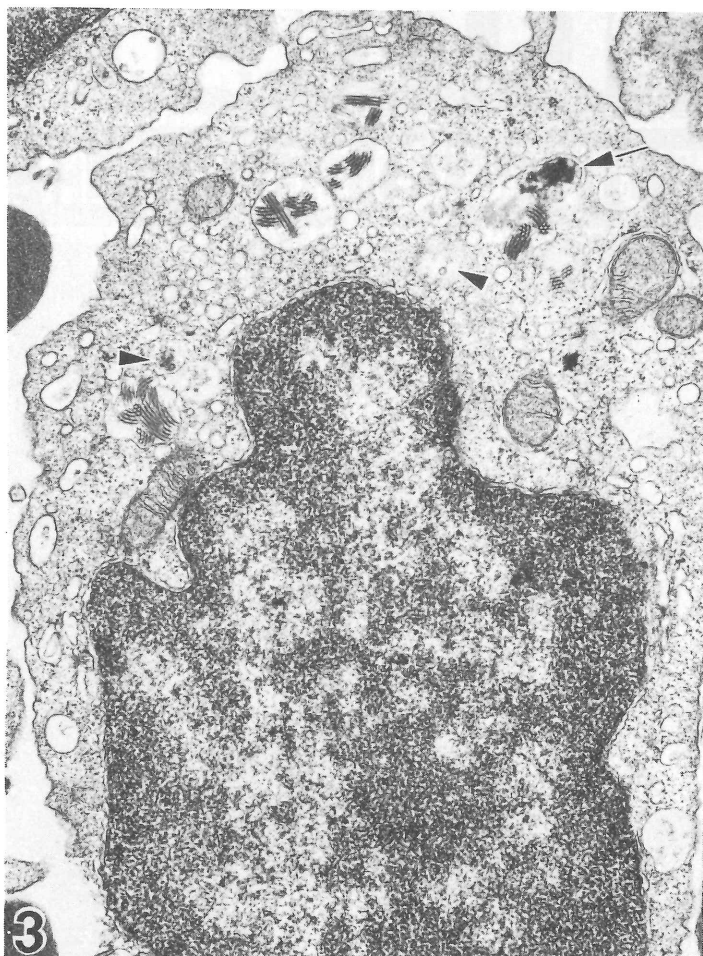


FIGURE 3. Lymphocyte from patient with Kearns-Shy syndrome demonstrating numerous tubular cytoplasmic structures — tubular polygonal, tubular reticular (arrow) and virus-like (arrowheads) inclusions, X 19,100.

ACKNOWLEDGEMENTS:

This work was supported in part by the Medical Research Service of the Veterans Administration. Technical assistance was provided by Kathy Porter, Sally Bates, and Jill Bast.

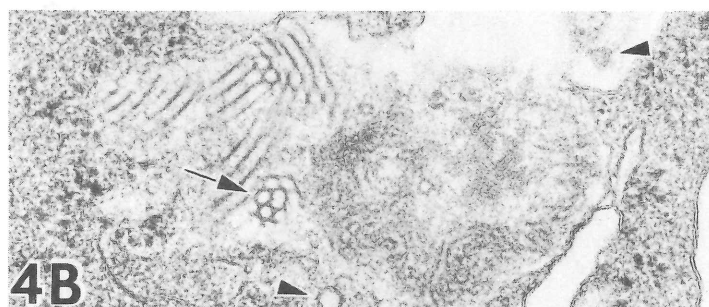
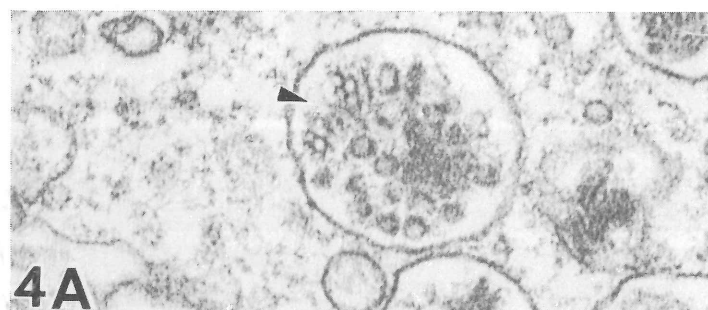


FIGURE 4. Enlarged views of tubular cytoplasmic structures in lymphocytes from patients with Kearns-Shy syndrome (A-B) and muscular dystrophy (C). x 68,000. A. Vacuole containing VLI and honeycomb appearing TPI (arrowheads). B. Vacuole containing TPI parallel longitudinal and cross-section (arrow) profiles, TRI and VLI (arrowheads). C. Nonoriented complex of microtubules at cell periphery.

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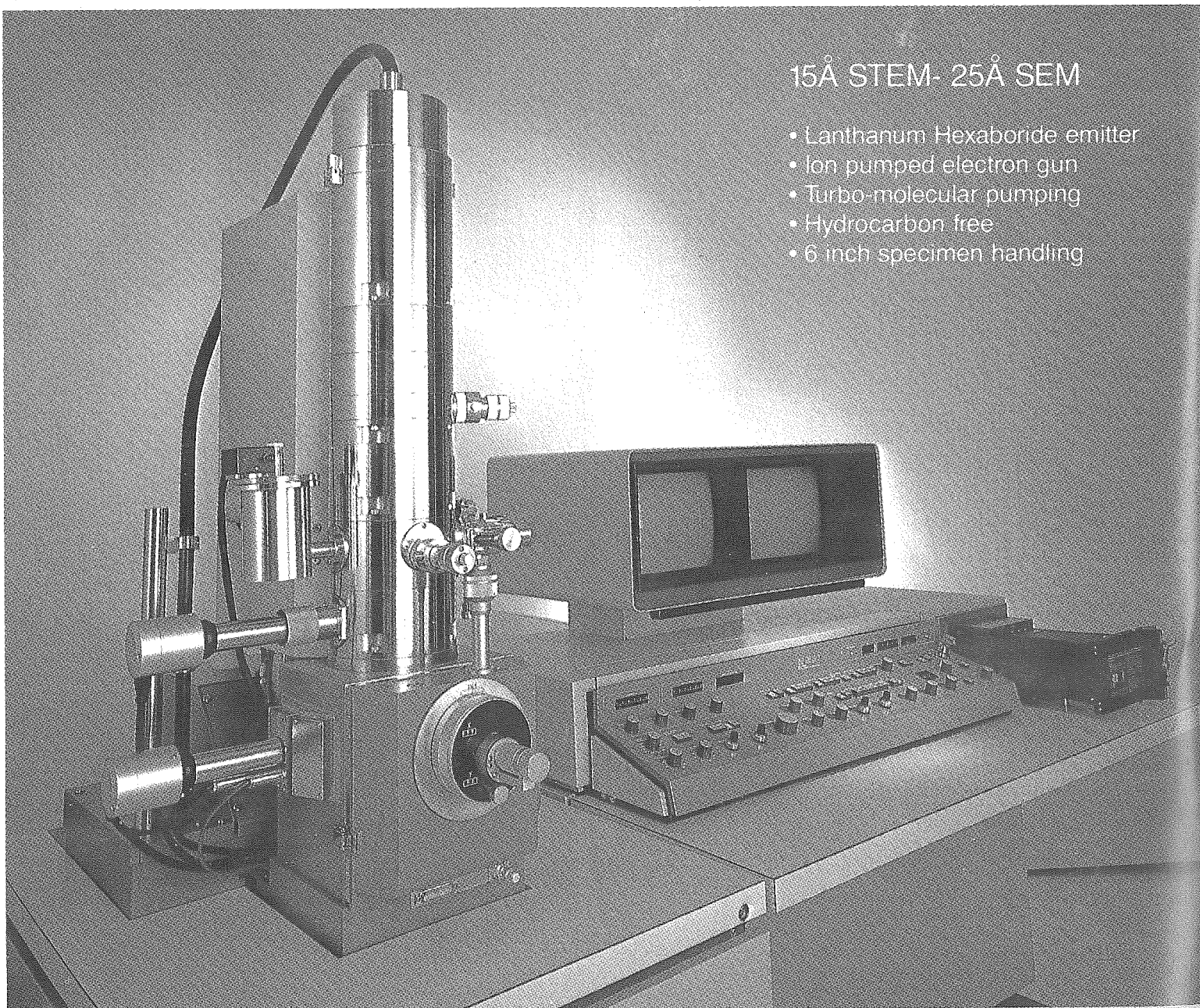
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Information as to position, degrees, and qualifications for Membership: _____

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Presented to the Council at _____ meeting. Date _____

Action _____

Remarks _____

Send Application to: Marilyn Smith
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Dept of Biology
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TSEM By-laws

Article I — NAME

The name of the Society shall be the Texas Society for Electron Microscopy.

Article II — PURPOSE

This Society is organized exclusively as a scientific and educational organization. The purpose of this Society shall be (a) to increase and disseminate knowledge concerning the biological and physical applications of electron microscopy and related instrumentation and (b) to promote free exchange of ideas and information among electron microscopists and interested participants. Notwithstanding any other provision of these articles, this society shall not, except to an insubstantial degree, engage in any activities or exercise any powers that are not in furtherance of the purposes of this society. No substantial part of the activities of the Society shall be the carrying on of propaganda, or otherwise attempting to influence legislation, and the Society shall not participate in, or intervene in (including the publishing or distribution of statements) any political campaign on behalf of any candidate for public office.

Article III — MEMBERSHIP

Membership in the Society shall be open to individuals who share the stated purpose of the Society. The Society shall consist of regular members, student members, corporate members, and honorary members.

An applicant, other than a corporate organization, having an interest in electron microscopy may be considered for regular membership. An applicant enrolled in an academic undergraduate or graduate program will be considered for student membership. Students wishing to become more involved in the Society may elect to apply for regular membership. Any applying commercial organization having an interest in electron microscopy shall be considered for corporate membership. A corporate membership shall entitle that corporation to designate one representative who shall receive membership benefits as a regular member. Other representatives of the same organization may apply for regular membership to receive Society privileges. Honorary membership shall be restricted to either (a) distinguished scientists who are not members of the Society, but who have made significant contributions to this Society or (b) to Society members for extended and outstanding service to this Society.

Application for regular, student, and corporate membership shall require nomination by any regular member in good standing and shall be made to the Secretary, who, with the approval of the Executive Council, shall report same at the next business meeting of the Society. A two-thirds vote of the regular members present shall elect applicants to membership.

Nominations for honorary membership may be made by any member of the Society. Nominations shall be made in writing to any member of the Executive Council and must be accompanied by written evidence of the nominee's eligibility. The member of the Executive Council shall present the nomination at the next meeting of the Executive Council for consideration. The Executive Council shall act upon the nomination within one year of its presentation and shall notify the nominator of the final action taken on the nomination.

Only regular members shall have the right to vote, to nominate new members, to hold office, or to serve on committees. Corporate members may exhibit at the Society's meetings (additional exhibition charges may be levied by the Executive Council). An honorary member shall be exempt from dues and shall be entitled to all privileges of regular membership. All members shall receive Society mailouts except for ballots which will be mailed only to regular members.

The amount of dues shall be set by the Executive Council. Dues shall become payable on January 1 of each year. Members unpaid by the Spring meeting shall be notified and if still unpaid will be dropped from membership after the Fall meeting.

Article IV — OFFICERS

A. Elected Officers

The elected officers of the Society shall be President, President-Elect, Immediate Past President, Secretary, Treasurer, Program Chair-

man, and Program Chairman-Elect. The President-Elect shall serve one year as such, one year as President, and one year as Immediate Past President. The Secretary shall be elected in even-numbered years and serve for a two year term. The Treasurer shall be elected in odd-numbered years and serve for a two year term. The Program Chairman-Elect shall serve one year as such, followed by one year as Program Chairman. The installation of incoming officers shall be at the Spring meeting. All officers shall arrange for the orderly and timely transition of their offices within 30 days after the installation of officers. However, all officers shall continue until relieved by their successors. The duties of the officers shall

1. **President:** shall preside at all business meetings of the Society and at meetings of the Executive Council. The President shall represent the Society at the annual meeting of the Electron Microscopy Society of America. The President shall conduct the business of the Society between Executive Council meetings.

2. **President-Elect:** shall assist the President and substitute for him in his absence and perform such duties as assigned by the President.

3. **Immediate Past President:** shall assist the President and Executive Council.

4. **Secretary:** shall maintain the records of the Society other than financial, and distribute announcements to the membership.

5. **Treasurer:** shall be custodian of the Society funds and shall account for them in accordance with accepted business practice. The Treasurer shall be bonded and the cost of such shall be borne by the Society. The Treasurer shall have his records examined annually by an internal audit committee chosen by the Executive Council at the Winter meeting. A written report of the internal audit shall be presented to the Executive Council and the membership at the Spring meeting.

6. **Program Chairman:** shall be responsible for organizing the various scientific activities of the Society. The Program Chairman shall not commit any funds of the Society unless authorized by the Executive Council via an approved budget or as authorized by the President and Treasurer under conditions of exigency.

7. **Program Chairman-Elect:** shall assist the Program Chairman and substitute for him in his absence and, additionally, extend the planning of programs into his own term of office as Program Chairman.

B. Appointed Officers

The appointed officers of the Society shall be the Newsletter Editor and the Student Representative who shall be appointed by the Executive Council.

1. **Newsletter Editor:** shall publish a Newsletter three times a year promoting the purpose of the Society, unless otherwise ordered by the Executive Council. The term of appointment shall be for two years and may be renewed.

2. **Student Representative:** shall represent the student membership of the Society on the Executive Council. The term of appointment shall be for one year.

Additionally, the officers of the Society shall perform the duties prescribed by the Bylaws and, as appropriate, by the parliamentary authority adopted by the Society. No part of the net earnings of the Society shall inure to the benefit of, or be distributable to its members, trustees, officers, or other private persons, except that the Society shall be authorized and empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of the purposes set forth in Article Two hereof.

Article V — MEETINGS

There shall be three scientific meetings per year: fall, winter, and spring, unless otherwise ordered by the Society or by the Executive Council. Exact times and places of these meetings shall be designated by the Executive Council. A business meeting will be held at each scientific meeting of the Society. Parliamentary procedures to be followed in the business meeting shall be those specified in the current edition of **Robert's Rules of Order Newly Revised**. Ten percent of the regular

members, or 35 regular members, whichever is smaller, shall constitute a quorum at a business meeting.

Article VI — EXECUTIVE COUNCIL

The Executive Council shall be responsible for the scientific and administrative obligations of the Society. It shall determine policies for the good of the Society in accordance with these By-laws; it shall plan scientific and business meetings, it shall authorize the expenditure of Society funds, and it shall conduct other duties as required for the benefit of the Society. The Executive Council shall meet prior to the business meeting at each scientific meeting of the Society. Special meetings of the Executive Council can be called by the President and shall be called upon the written request of three elected members of the Executive Council.

At each spring meeting the Executive Council shall appoint a Student Representative who shall represent the student membership of the Society on the Executive Council the following year as a voting member. The Executive Council shall also appoint Local Arrangements Chairmen for each of various meetings and in so doing shall duly consider the recommendations of the PROGRAM Chairman and the President. Local Arrangements Chairmen are *ad-hoc*, non-voting members of the Executive Council.

Executive Council meetings are open to the membership.

The elected and appointed officers shall constitute the Executive Council. The President and four other elected officers or the President-Elect and four other elected officers shall constitute a quorum.

Article VII — COMMITTEES

Standing or special committees shall be appointed by the President as directed by these By-laws or as the Society, or the Executive Council, shall from time to time deem necessary to carry on the work of the Society. The President may appoint advisory committees at any time without prior consultation with the Executive Council. The President shall be *ex officio* a member of all committees except the Nominating Committee.

Article VIII — ELECTIONS AND INTERIM VACANCIES

In February of each year the Executive Council shall choose three regular members to serve on the Nominating Committee with the President-Elect, and the Secretary. The Secretary shall serve as chairman of the Nominating Committee. The Nominating Committee shall nominate two candidates for each officer position becoming vacant that year. In preparing the slate of nominees, due consideration shall be given to the geographical area and fields of interest represented by the membership of the Society and to the nominees previous participation in the Society's affairs. The Nominating Committee shall also ascertain the willingness of each nominee to serve if elected. The report of the Nominating Committee shall be announced to the regular membership by March 1.

Additional nominations may be initiated by the membership by a petition to the Secretary signed by a minimum of ten of the regular members. Such petitions must be received by the Secretary by March 15.

Ballots shall be mailed to the regular members in March and com-

pleted ballots shall be accepted by the Secretary until April 15. The Secretary shall count the ballots on the next appropriate day and announce the results of the election at the spring business meeting and by mailout to the regular membership. Any regular member may examine the ballots at the spring business meeting.

The candidate receiving the largest number of votes shall be the winner. In the event of a tie vote, the Executive Council shall decide the winner. The ballots shall be examined by the Executive Council at the spring meeting.

A two-thirds vote of the entire membership of the Executive Council shall remove any officer or appointee derelict in their duties. The Executive Council shall accept resignations in good faith.

An interim vacancy in the presidency shall be filled by advancement of the President-Elect, who will go on to serve his anticipated term as President and Immediate Past President. In the event there is no President-Elect to advance, the Executive Council shall elect one of its members as acting President to serve until the completion of the next regular election. An interim vacancy in the office of Program Chairman shall be filled by the Program Chairman-Elect, who will go on to serve his anticipated term as Program Chairman. If there is no Program Chairman-Elect to advance, the Executive Council shall appoint a Program Chairman to serve until the completion of the next regular election. Interim vacancies in the offices of Secretary or Treasurer shall be filled by appointment by the Executive Council until the completion of the next regular election. Interim vacancies in the offices of Newsletter Editor or Student Representative shall be filled by an appointment made by the Executive Council.

Article IX — DISSOLUTION

Upon the dissolution of the Society, the Executive Council shall, after paying or making provision for the payment of all the liabilities of the Society, dispose of all of the assets of the Society exclusively for the purposes of the Society in such manner, or to the Electron Microscopy Society of America. Any such assets not so disposed of shall be disposed of by the Court of Common Pleas of the county in which the principal office of the Society is then located, exclusively for such purposes or to such organization or organizations, as said Court shall determine, which are organized and operated exclusively for such purposes.

Article X — AMENDMENTS

Amendments to these By-laws may be initiated by individual members of the Executive Council or by petition to the Secretary signed by ten regular members of the Society. Amendments must be approved by a two-thirds majority of the Executive Council, the proposed amendment shall then be promptly submitted by mail to the regular membership by the Secretary with statements of support and/or opposition by the Executive Council. The ballots shall be accepted by the Executive Council for one month after the date of mailing. The Executive Council shall count the ballots; the amendment(s) shall be ratified if it receives a favorable two-thirds majority of the votes cast. Any regular member can, if he so desires, be present at the counting of the ballots.



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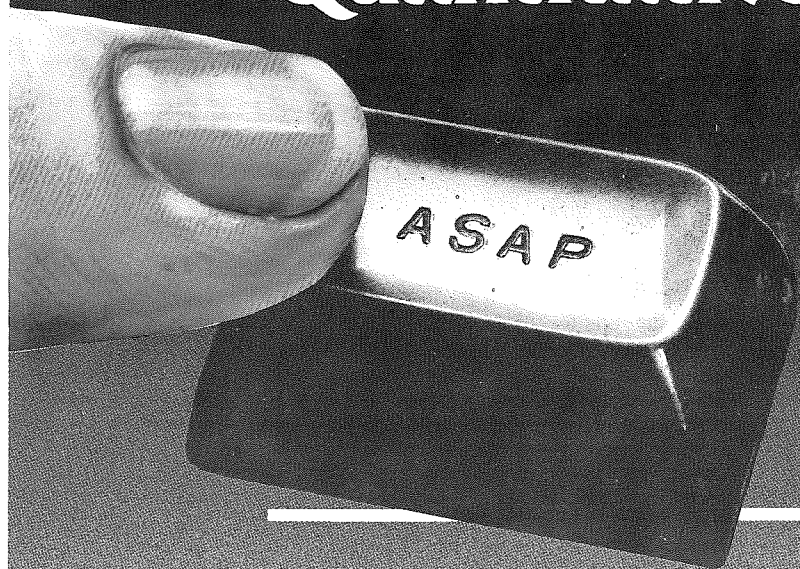
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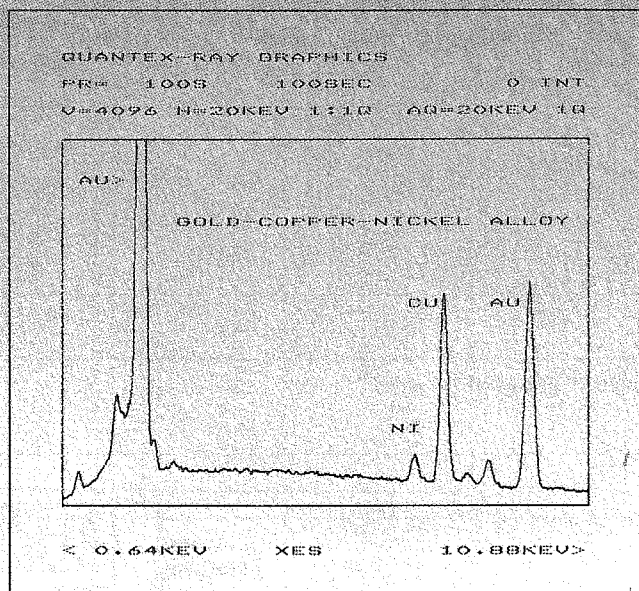
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AUCU-1

STANDARDLESS EDS ANALYSIS
(ZAF CORRECTIONS VIA MAGIC V)

ELEMENT & LINE	WEIGHT PERCENT	ATOMIC PERCENT	PRECISION 2 SIGMA	K-RATIO	ITER
NI KA	2.52	5.83	0.20	0.0302	4
CU KA	18.72	40.03	0.60	0.2266	
AU MA	78.45	54.13	1.09	0.6932	
TOTAL	99.68				

TECHNICIAN SURVEY

Please Mail in by August 1, 1981

1. Have you attended or do you plan to attend the annual EMSA meetings?

2. If EMSA continues to support sessions for discussing the needs of technicians, would you favor such a session? Would you be willing to participate?

3. For the 1981 meeting, the tentative topics of discussion include:

a. Certification

b. Communication among technical support staff

c. Unionization

d. Salaries

e. Survey results

Please comment on these topics.

4. Are you EMSA certified? If you are not EMSA certified, do you feel adequately informed about the certification process? If you are EMSA certified, please comment on your feelings about the EMSA certification procedures.

5. Did your present position require that you be EMSA certified? Are your superiors aware of the certification process? Do they feel it is significant?

6. Are you in favor of a periodic meeting of the technicians within your geographic area?

7. Please suggest any other issues you feel need to be discussed.

Position title: _____ Highest degree earned: _____

Number of People Supervised: _____ Years Experience: _____

Type of Institution: Industry/Medical School/University/Private Laboratory: _____

Salary: _____

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TSEM Minutes

The TSEM Business Meeting was called to order by President Baur at 8:00 p.m., April 24, 1981, at the Kahler Green Oaks Inn in Fort Worth, Texas.

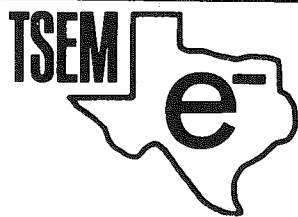
1. The minutes were read and approved.
2. The Treasurer's report was presented and approved. As of April 22, 1981, the society's assets had reached \$10,100.
3. New members were presented and accepted into membership of the society.
4. The Paul Enos Memorial Trust Fund for Student Awards was announced. Awards will be decided upon by the Executive Committee.
5. President Baur announced that the President-Elect will, in the future, have the duty of being responsible for the corporate member's wishes.
6. The results of the Spring election were announced.
President-Elect: Bruce Mackay
Treasurer: Allen Shannon
Program Chairman-Elect: C.P. Davis
7. Future meetings were announced as follows:
October 9-11, 1981, in Corpus Christi
Joint meeting with the Texas Biological Photographers' Association

April 1-3, 1982, at TWU in Denton
Spring of 1983, in Galveston

8. An announcement was made that the TSEM Journal will be published in four issues per year.
9. Five applicants for student travel would be paid expenses from the \$600 available for that purpose.
10. President Baur announced that the Physical Sciences and the Biological Sciences will not try to combine and thus there will be no Physical Science Session in TSEM.
11. President Baur turned the gavel over to the new President, Ann Goldstein.
12. President Goldstein presented Paul Baur with a plaque of appreciation for serving as president.
13. The meeting was adjourned at 8:40 p.m.

Respectfully submitted,

Marilyn N. Smith
Secretary, TSEM



CORPORATE MEMBERS

AMRay, Inc. Thomas Levesque, 5209 Kisor Drive, Box 83416, Lewisville, TX 75056, (214) 247-3542.

Cambridge Scientific Instruments, Mike Webber, 3945 Farrington Dr., Marietta, Georgia 30066, (404) 926-9636.

Carl Zeiss, Inc., Dietrich Voss, 3233 Wesleyan, Suite 191, Houston, TX (713) 629-0730.

EBTEC Corp., Margrit Barry, 120 Shoemaker Lane, Agawam, Mass. 01001, (413) 786-0393.

EDAX International, Jim Moore, P.O. Box 2253, Boulder, Colorado 80306, (303) 443-3610.

E.I. DuPont de Nemours & Co. Inc., Biomedical Products Division, Harry Vacek, Concord Plaza-Quillen Building, Wilmington, Delaware 19898, (800) 441-7493 or (302) 772-6024.

EG&G Ortec, Dick Nieman, 21718 Rotherham, Spring, TX 77379, (713) 353-0078.

Electron Microscopy Sciences, Richard Rebert, Box 251, Ft. Washington, PA 19034, (215) 646-1566.

Ernest Fullam, Inc., Richard Kemmer, 900 Albany Shaker Rd., Latham, NY 12110, (518) 785-5533.

Gatan, Inc., Terry Donovan, 780 Commonwealth Dr., Warrendale, PA 15086, (412) 776-5260.

Hitachi Scientific Instruments, Rod Norville, 460 E. Middlefield Rd., Mountain View, Calif. 94043, (415) 961-0461.

International Scientific Instruments, Robert Ruscica, 3255-6C Scott Blvd., Santa Clara, Calif. 95050, (408) 727-9840.

JEOL, USA, Inc., Dick Lois, 1 Kingwood Place, Suite 122B, 600 Rockmead Dr., Kingwood, TX 77339, (713) 358-2121.

KEVEX Corp., Dick Cushing, 1101 Chess Dr., Foster City, CA 94404, (415) 573-5866.

Ladd Research Industries, Margaret Ladd, P.O. Box 901, Burlington, Vermont 05402, (802) 658-4961.

LKB Instruments, Inc., Jonni Fischer, 2407 W. Settlers Way, Woodlands, TX 77380, (713) 228-4082.

Olympus Corp., Precision Instruments Division, Susie Miles, 5201 Mitcheldale, Suite B-1, Houston, TX (215) 965-9761.

Polaron, Dermot O. Dinan, 4099 Landisville Rd., Doylestown, PA 18901, (215) 345-1782.

Polyscience, B. David Halpern, Paul Valley Industrial Park, Warrington, PA 18976, (215) 343-6484.

Princeton Gamma Tech, Dick Stancher, 17756 Kings Park Lane, Houston, TX 77058, (713) 280-8766.

Rockwell International, R. W. Max, Mail Station 406-146, Richardson, TX 75081, (214) 996-6973.

Technical Instruments Co., John J. Meny, 4215 Beltwood Parkway, Suite 106, Dallas, TX 75234, (214) 387-0606.

Technics EM Systems, Inc., Diane A. Hurd, 7653 Fullerton Road, Springfield, VA 22153, (703) 569-7200.

Ted Pella, Inc., T.P. Turnbull, 16812 Milliken Ave., Irvine, CA 92714, (800) 854-7553, (714) 557-9434.

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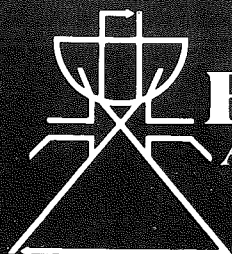
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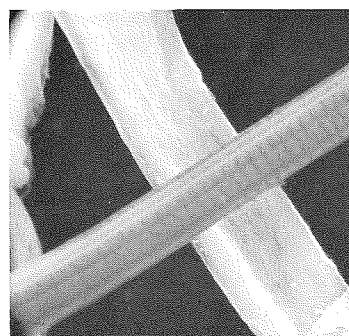
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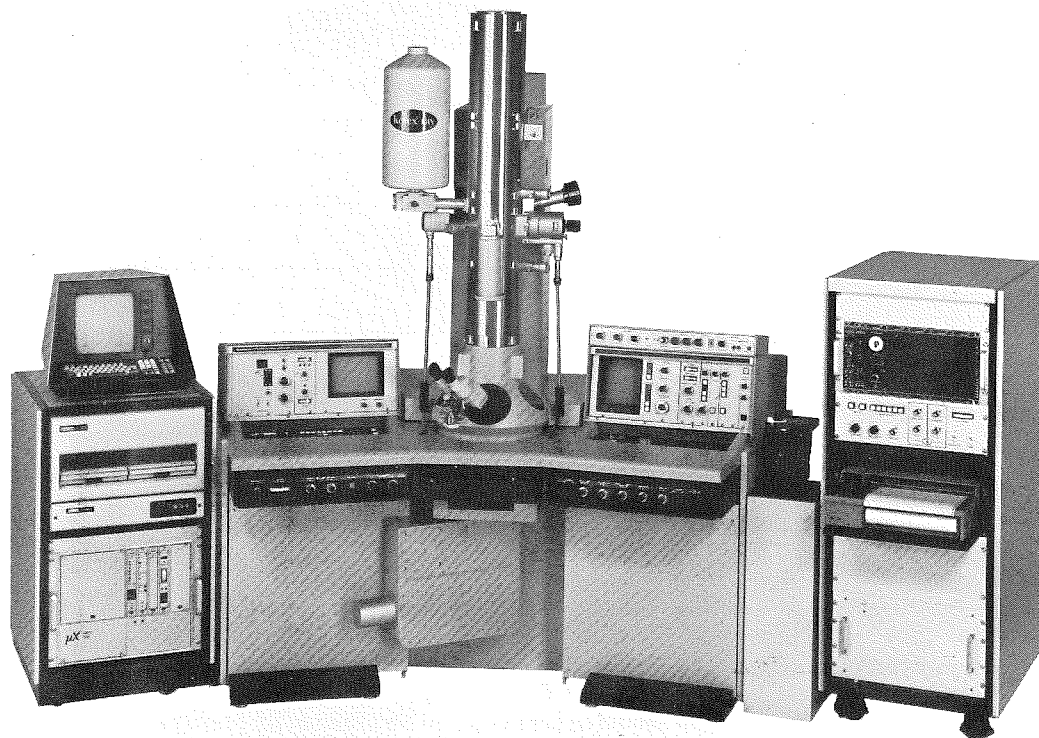
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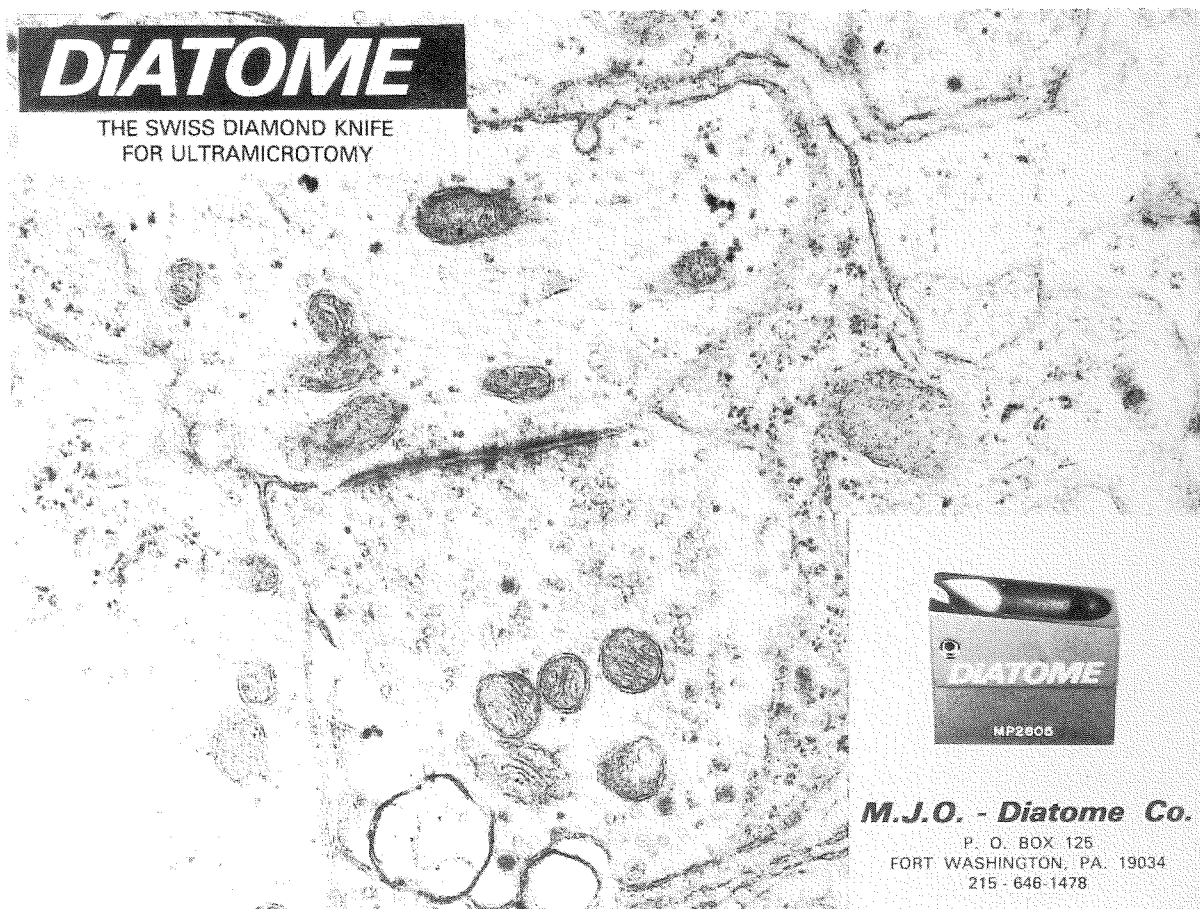
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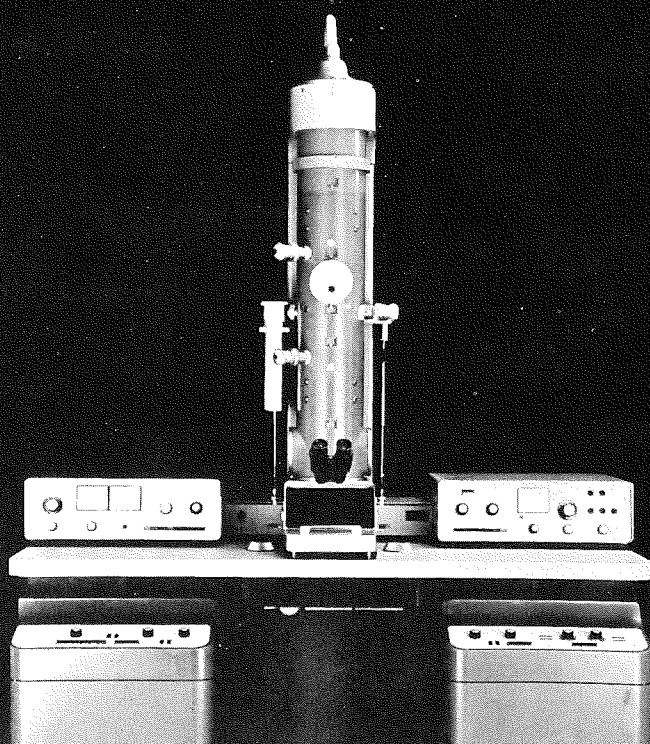
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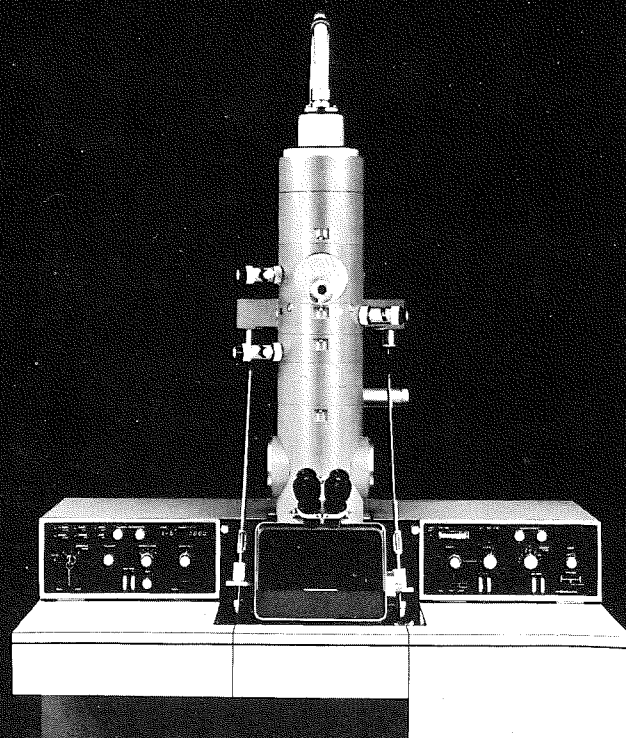
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The conference is organized with the **following intents and purposes:**

1. Identify those research areas which are well understood and least understood, i.e., those areas for future research.
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The topics to be covered include (i) **fundamentals of electron beam interaction** with solid targets (including elastic & inelastic cross sections; backscattered, secondary, and Auger electrons, electron-hole pairs, and X-ray production; and electron energy loss spectroscopy), (ii) **modeling of electron beam interactions** with solid target including analytical methods (using backscattered electrons and depth distribution of ionizations), Monte

Carlo methods, transport equation methods and electron channeling, and (iii) **applications of electron-beam interactions** with solid targets including radiation effects (in materials, biological samples and microlithography), fundamental limits in electron lithography; and signal-detector strategy.

Dr. David Kyser (IBM Research Labs, K63-282, San Jose, CA 95193; phone 408-256-1991, **as the General Chairman**), **Dr. Dale E. Newbury** (National Bureau of Standards, Washington, DC, phone 301-921-2875), **Prof. Dr. Heinz Niedrig** (Technical University, Berlin, phone 030-314-2735), and **Prof. Ryuichi Shimizu** (Osaka University, Japan, phone 06-877-5111 ext. 4658) are the organizers of this program.

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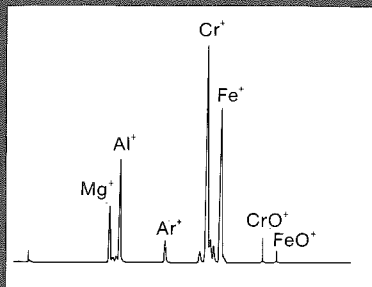
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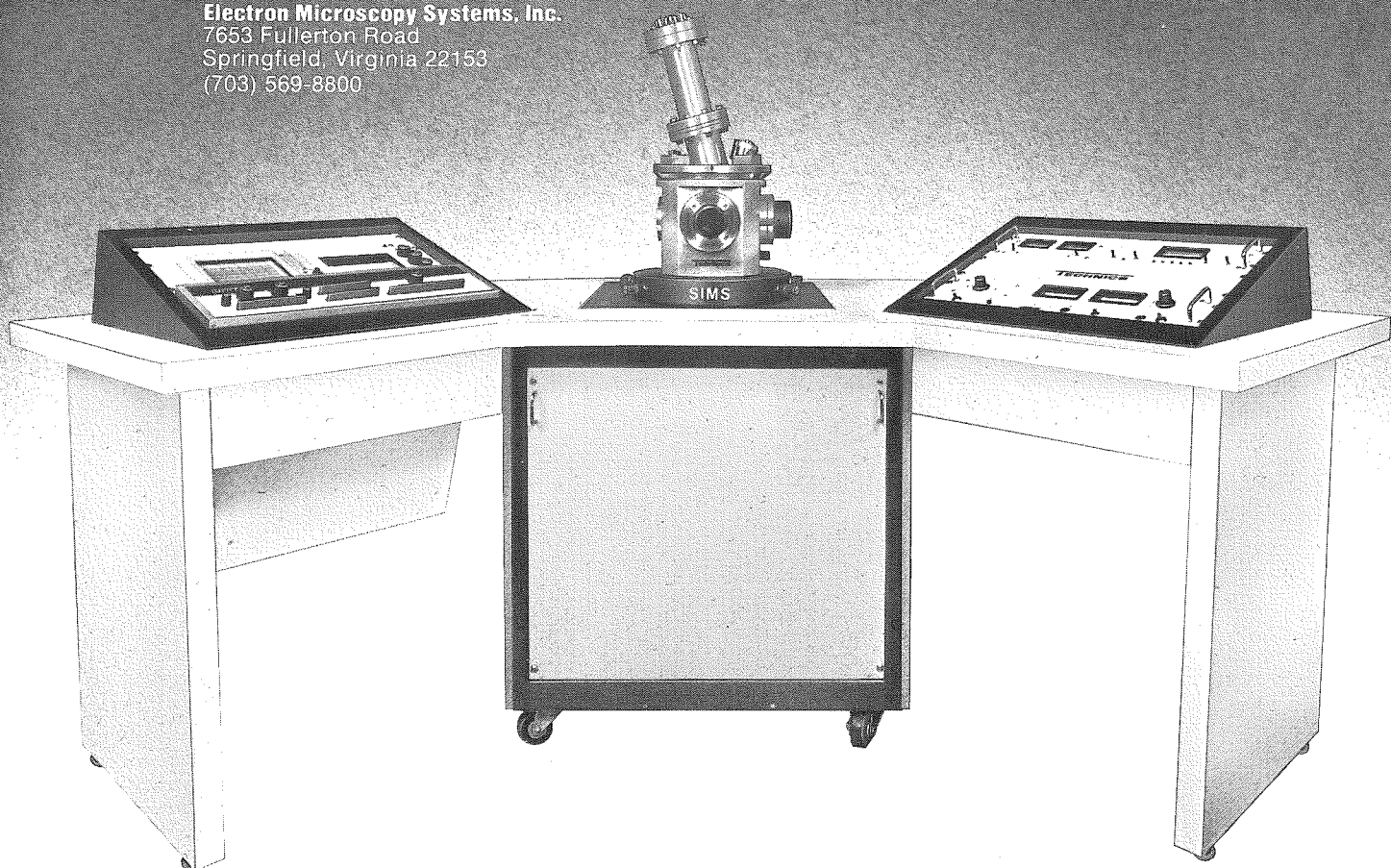
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