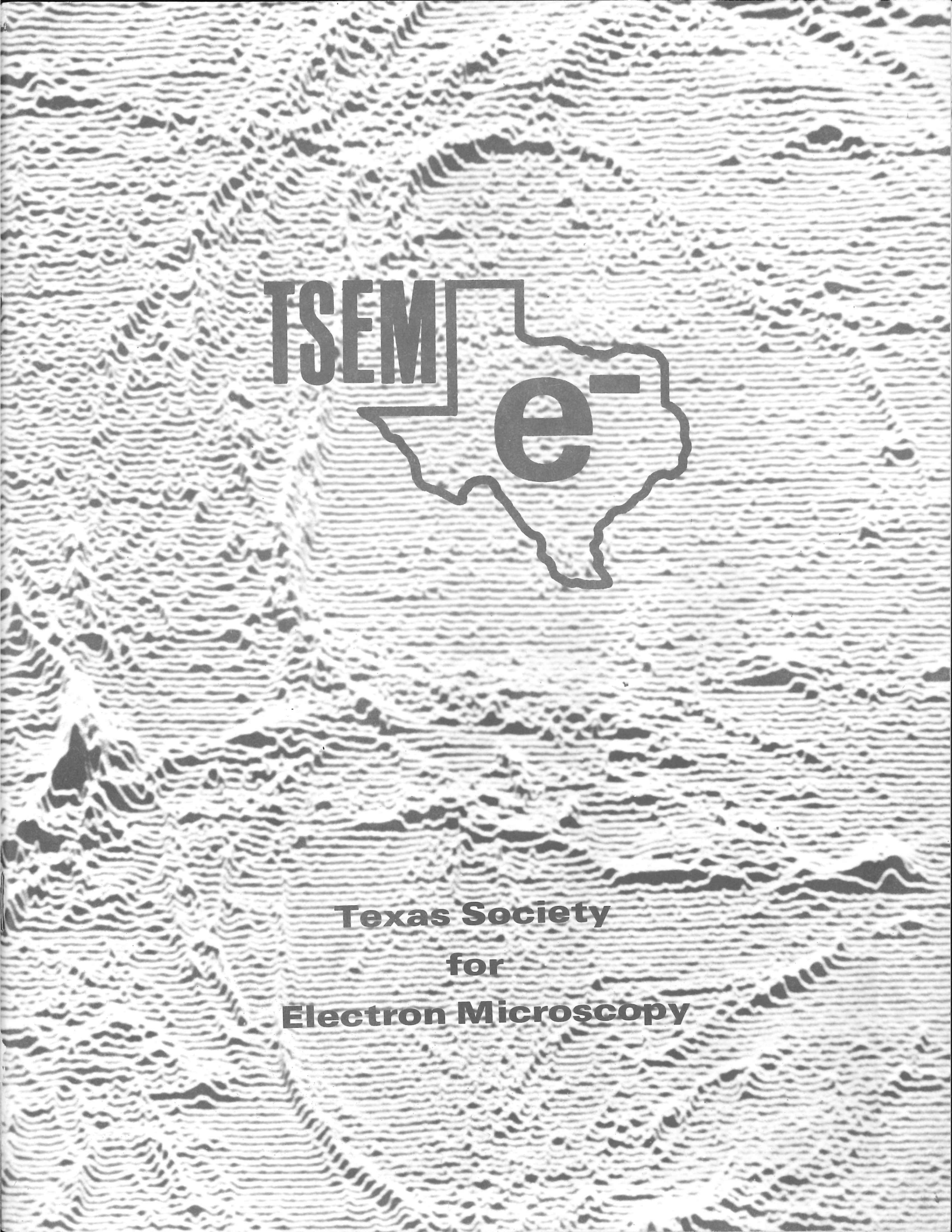


# Texas Society for Electron Microscopy

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# TEXAS SOCIETY FOR ELECTRON MICROSCOPY

Volume 4 Number 1

# NEWSLETTER

Fall 1972



Letters and Inquiries to: Dr. C. Ward Kischer
Editor, T.S.E.M. Newsletter
Department of Anatomy
U.T.M.B.
Galveston, Texas 77550

Current Membership Strength: 325 Individuals
19 Corporations

# PROFITS, PATRONS, AND PROTECTION

Not long ago I carried on a dialogue with Thomas C. Watson, Chairman of the Board of I. B. M., in which I criticized his policy of selling computers to communist satellite countries.

His defense was totally without reference to the profit motive or that of new marketing areas. For that, I considered his rationalizations to be basically dishonorable. The first requisite for a privately owned company dealing in products or services is to make a profit. There is no dishonor in that. Anyone who can service an instrument better than the next fellow, or who can market a more efficient and durable product than someone else, should reap the fruits of this labor, and usually will.

However, there does not seem to be a great amount of reliance or dependency expressed on services or products today by the individual consumer. There is no doubt about this. Even if you have not observed such, personally, witness the field day Ralph Nader is having. Or, sample the number of lawsuits filed against small businesses or large corporations, or observe the traffic through a small claims court. Further, many states have enacted Consumer Protection Laws, Texas being one of them.

It would appear that the worsening manufacturer - consumer relations is largely due to attitudes expressed by the former. True, some people lie in wait to sue for exemplary, as well as real, damages, and this betrays their basic motives. But, most people are willing to suffer some amount of inadequate service or inferior quality of product until the threshhold level of exhausted patience is reached. Are manufacturers and suppliers exhibiting a callous disregard for their customers? Perhaps, but not likely. A case of benign neglect? Most likely, but, if so, why?

There are several answers to this. One is that as the volume of business becomes greater the attention to service or product becomes less. The number of consumers has risen considerably in the past twenty-five years and these consumers represent new marketable areas. To handle the increasing load of business, computers have been installed, not just to handle account numbers, billings, invoices, etc., but also to handle complaints.

Why is it that invariably the Consumer Relations Manager (where complaints and requests go) is named Jim Roberts or Richard North or Ed Smith? Well, who would give a computer a name such as Wodecky Bagnanovich? If Wodecky is the guy who can really ease your discomfort, just try to get channelled to him directly. Fortunately, most of the suppliers important to us put men in the field who make regular calls. I, for one, appreciate this and, often, it has led to a rapid and satisfying conclusion to a real problem.

I did have one of these field men say to me sometime ago, "Since you don't have grant money I can't afford to use my time to call on you." Now that I do, I don't use my time to have him call.

In a recent Time magazine Essay, the case is made for consumers to complain louder, for, "One complainer can easily be dismissed as a crank or a fuss-budget, but the power of the complaint grows mightily with numbers ... The very fact that the common complainer feels the need for a champion [like Ralph Nader] is a demonstration that he feels ineffectual as an individual."

In my attempts to achieve equity for diamond knife users in the TSEM, I also found 'benign betrayal' in that one laboratory using more than twenty-five knives replied no effort was made to get complaints resolved; rather, they "accepted the known risk factor". Is a supplier or manufacturer likely to answer a complaint from a user of one knife as quickly as from a user of twenty-five knifes? I think not.

It now seems apparent that a standing committee will be formed in EMSA to mediate complaints relative to diamond knives. In TSEM the suggestion was made at our last meeting for us to do the same, not only for diamond knives but for all other consumer-supplier complaints.

Rather than creating a 'watchdog' committee at this time, would it not be better to use the amicus curiae approach and form, say, an amicus corpora committee (friend of the body), which would seek personal resolution between consumer and supplier. Of course, the cooperation of the corporate bodies would be expected. In the event it is not available, then would be the time to impose sanctions from a collective power.

In the mad rush to supply the demand for the products and by-products of an accelerating technology, manufacturers and suppliers have become near sighted. No longer is technology reverred and no longer is it satisfying just to get something to work. It must work right!

My father was and still is a successful salesman. I mean, he did not burn the mortgages of any company, but he never lost business for them. I've seen him stand and wait terribly long periods of time simply waiting to be

heard. He realized that not only did he have a product for them, he also was rendering them a service -- the best he could deliver. In short, he was making himself available.

Ward Kischer
Editor

Note: The Editor invites communications from the readers and other editorial opinion. Please send letters and/or comments to the Editor. All reasonable contributions will be published.

# PRESIDENT'S MESSAGE

Speaking for the Society, I would like to thank the previous Executive Committee, the Local Arrangements Chairmen, and the Newsletter Editor for a job well done. I should also emphasize that the success of our meetings was made possible thanks to the support of our corporate members.

At the time of this writing, the preparations for the San Antonio meeting are almost completed, and I hope that you will scientifically profit in an enjoyable way. It has always been the special charm of this Society to communicate science in a relaxed and intimate atmosphere.

The purpose of our existence as a group is "to increase and diffuse knowledge" in our fields of interest. That is why we have three meetings per year. Since our professional activities are often highly diverse, unified only by the electron microscope, I ought to remind our members, when presenting a paper, to be gentle with those colleagues who work a different field. In other words, an interesting and simple introduction should always precede the presentation such that everybody may appreciate your results and take home a lesson, unless you are prepared to admit that your work is of little interest. For example, a physicist fascinated by dislocations should be able to transmit some of this fascination to a biologist and, in turn, a swollen mitochondrion should appeal to him, too. A bit of show business may help without blemishing your reputation. I am sure our distinguished guest speaker, Dr. John Watson, will agree with that.

Finally, I would like to remind you of the joint Symposium of the Louisiana and Texas Societies for Electron Microscopy on February 8 and 9, 1973, at the Chateau Le Moyne Hotel, New Orleans. A call for papers was issued in June. Titles and abstracts (not more than 150 words) should be submitted before December 8, 1972, to Miss Linda Lee Muller, Southern Regional Research Laboratory, P. O. Box 19687, New Orleans, Louisiana 70179. Guest speakers include H. Fernández-Morán, W. J. Humphreys, K. R. Lawless, D. C. Pease, and B. M. Siegel. I hope that many of us will be able to attend the meeting.

Dimitrij Lang
President

# DIAMOND KNIVES AGAIN

Excerpts from

## THE WEAR OF DIAMOND DIES

by

L. Schultink, H. L. Spier, and A. J. van der Wagt

Philips Technical Review 16 : 91-97, 1954

"The great value of the diamond is not only due to its rareness and its excellent refractive properties, to which it owes its unique place among precious stones, but equally well to its tremendous mechanical hardness and resistance to wear. These last two properties in particular have won it an unassailable position among materials for tools. Apart from its use for cutting tools, for bearings and as an abrasive, diamonds have proved of great value as drawing dies, for producing wire from very hard metals such as tungsten and molybdenum. Even diamonds, however, are subject to wear under continuous use. Special research in this field gives sufficient evidence to assume that the wear on diamond drawing dies can be reduced to a minimum by employing the most suitable cristallographic orientation of the drawing cone.

. . . . . .

When the various diamond faces are ground (neglecting for the moment the direction of grinding) it is found that the three planes most commonly occurring show different wear resistance. The rhombic-dodecahedral faces are as a rule most easily ground, i.e., the material is readily removed by a force acting in the rhombic-dodecahedral plane. The cube faces are harder to

deal with, and the octahedral faces are the most wear-resistant, which means that a force acting in the octahedral plane removes only very little material.

In a given plane, however, the direction of grinding is also of importance. Each type of plane is found to have one or more preferential directions, along which the wear resistance is smallest. In the (110)-plane this preferential direction is along the cube direction in that plane, in the (100)-plane both cube directions are equally preferential, whereas in the octahedral planes the orthogonal projections of the three cube directions in that plane are the directions of preference.

.....

The above considerations lead to the theoretical conclusion that drawing holes should preferably be drilled as nearly as possible perpendicular to an octahedral plane in order to incur the minimum amount of wear.

.....

Diamond, as is known, is totally inert to the conventional pickling and etching reagents.... It has been found that the time required to obtain the same etching effect on a (111), a (110) and a (100)-plane is quite different.

.....

Theoretically it may be expected that the wear[ing quality of] diamond dies will greatly depend upon the crystallographic orientation of the drilled hole, on account of the crystallographic arrangement and the special type of bond between the carbon atoms. Because of this, there are certain preferential orientations of a diamond face along which grinding is relatively more easily achieved. This is confirmed by diamond-working practice. The conclusion is reached that the least wear on a drawing die will occur if the hole is drilled perpendicular to an octahedral plane. This conclusion is checked against the etch patterns obtained by a special technique on the major faces of a diamond. Practical confirmation of these conclusions can only be obtained after a statistical examination of a great number of drawing dies. "

---

QUESTION: Can a cutting edge be prepared on a diamond knife in the same way as above? Perhaps we should assume the diamond knife manufacturers know of this already. It would be interesting to find out.

# A Chronicle of Guarantee Statements as Issued by Two Major Diamond Knife Suppliers

## HACKER INSTRUMENTS

1 April 1967: "Every knife is guaranteed for resharpening. The cutting edge of every knife is examined by us and guaranteed to be free from defects for flawless sectioning."

1 December 1969: "The cutting edge of every knife is examined by us and guaranteed to be free from defects for flawless sectioning." (Editor's note: Under a heading Resharpening they say the following: "Due to the nature of diamond knives we cannot guarantee they will withstand the resharpening process and may be rendered unusable. It is expressly understood that there is no liability expressed or implied by Hacker Instruments, Incorporated, should this occur.")

1 February and 1 April 1970: "The cutting edge of every knife is examined by us and guaranteed to be free from defects for flawless sectioning. . . . We further guarantee that the diamond knives can be resharpened three times if in a typically dull condition."

January 1972: "The H/I diamond knives are guaranteed to produce satisfactory sections." (Editor's note: Under a heading Resharpening it is stated, "It is expressly understood that there is no liability expressed or implied by Hacker Instruments, Incorporated, should a diamond knife not withstand the sharpening process and be rendered unusable.")

## DUPONT INSTRUMENTS

12 January 1970: "DuPont guarantees that its diamond knives can be resharpened three times if in a typically dull condition."

1 March 1972: "DuPont guarantees that its diamond knives can be resharpened three times if in a typically dull condition."

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# THE SCANNING ELECTRON MICROSCOPE

David S. McKay

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Houston, Texas 77058

## Introduction

The Scanning Electron Microscope (SEM) is an extremely powerful tool. It has been going through an almost exponential increase in popularity in the past several years. There are several reasons for this increased popularity:

(1) The basic advantages of the SEM are readily apparent and as more research groups become aware of these advantages scientists are increasingly using the SEM in many of their studies. These advantages include the remarkable three-dimensional quality of the SEM photographs, the great depth of field shown in the photographs, the relatively simple preparations, and the comparatively easy interpretation of the pictures.

(2) Commercial instruments have shown recent marked improvement in performance and versatility. The spatial resolution of the best instruments is now better than 100 Å compared to 250 - 300 Å a few years ago. While the more sophisticated instruments still cost in excess of $70,000, simpler new models are available at considerably lower prices. One manufacturer is now advertising a complete SEM for $15,000.

(3) Scanning electron microcopists have developed many new techniques of sample preparation and new types of analysis as well as improved methods of data reduction. The usefulness and areas of application of the SEM have been considerably expanded as a consequence.

## History of SEM

The recent rapid development of the SEM continues a relatively long evolutionary history. The concepts and crude prototypes were first developed in Germany in the late 1920s and in the 1930s by M. Knoll and others. Groups in France and in the U.S.A. also participated in the development and the RCA group under Zworykin first designed and instrument with 500A resolution. The greatest advances were made in the late 1940s and in the early 1950s by the group at Cambridge, England, under Professor Oatley. The first commercial instrument was put on the market in 1963 by Stewart, one of Oatley's ex-students. This original Cambridge instrument was followed by the Jeolco instrument and now at least nine companies are marketing scanning electron microscopes.

## Components and Operation of SEM

The typical SEM consists of a triode (filament, grid, anode), electron gun, one or two condenser lenses, an objective lens, scanning coils, and a collector for secondary electrons from the sample. The SEM operates essentially as a complex closed circuit television system. The camera of this system is made up of the scanning coils, the electron beam scanning the sample, and the electron detector. The signal is amplified in the photomultiplier and the electronic amplifier and is used to modulate the intensity of an oscilloscope (or television) screen on which the beam is moving in synchronization with the beam moving on the sample. In a transmission electron microscope, the electron beam is scattered and diffracted by the sample and must then be refocused to create an image of the sample. But in a scanning electron microscope, the electrons emerging from the sample do not have to be focused and are simply collected by a positively charged grid and a detector.

Sample preparation consists of attaching the sample to a sample stub and placing it in the microscope. If the sample is biological material it is usually necessary to preserve, fix and dry it so that it is not deformed by the vacuum of the microscope. Most nonconducting samples must be coated with carbon, gold, or other conducting material before they can be properly viewed with the SEM. Sample preparation for the SEM, while basically simple compared to that necessary for transmission electron microscopy, has become a major area of study and development.

In addition to the secondary electrons which are used for the basic imaging, other types of signals are produced by the interaction of the primary electron beam with the sample. These include back scattered electrons, conducted electrons, transmitted electrons, Auger electrons, light photons, and X-rays. X-rays can be detected with an energy dispersive X-ray detector and can be analyzed to determine the elemental composition of the sample. This technique is very sensitive and as little as $10^{-18}$ grams of an element can be detected under favorable conditions.

## Recent Advances and Future Development

The resolution of a SEM is related to the intensity or brightness of the electron source. Considerable effort has been made to produce a brighter source and two new types of brighter electron guns have been developed: lanthanum hexaboride source and field ion source. Both have resulted in improved resolution. A specialized microscope using a field ion gun has been built by Crewe and has shown 5 Å resolution under scanning transmission operation. Many commercial SEM manufacturers have developed or are developing high brightness guns and within the next few years they may be commonly in use. Other new developments include computer processing of signals to provide metric and statistical data, ion etching of samples to reveal internal structure, pseudo-kikuchi or electron channeling observation to provide crystallographic data, use of hot stages, cold stages, tensile stages, and internal micromanipulators. Microfabrication techniques are also being developed.

## Literature

A good basic description of the Scanning Electron Microscope is given in one article in Scientific American (T.E.Everhart and T.L.Hayes, "The Scanning Electron Microscope", January 1972, pp. 54-69).

The most comprehensive source is the Annual Proceedings of the Scanning Electron Microscope Symposia organized by Om Johari and sponsored by I.I.T. Research Institute, Chicago, Illinois 60616. These proceedings include a bibliography of SEM papers compiled by O.C. Wells.

# SCANNING ELECTRON MICROGRAPHS

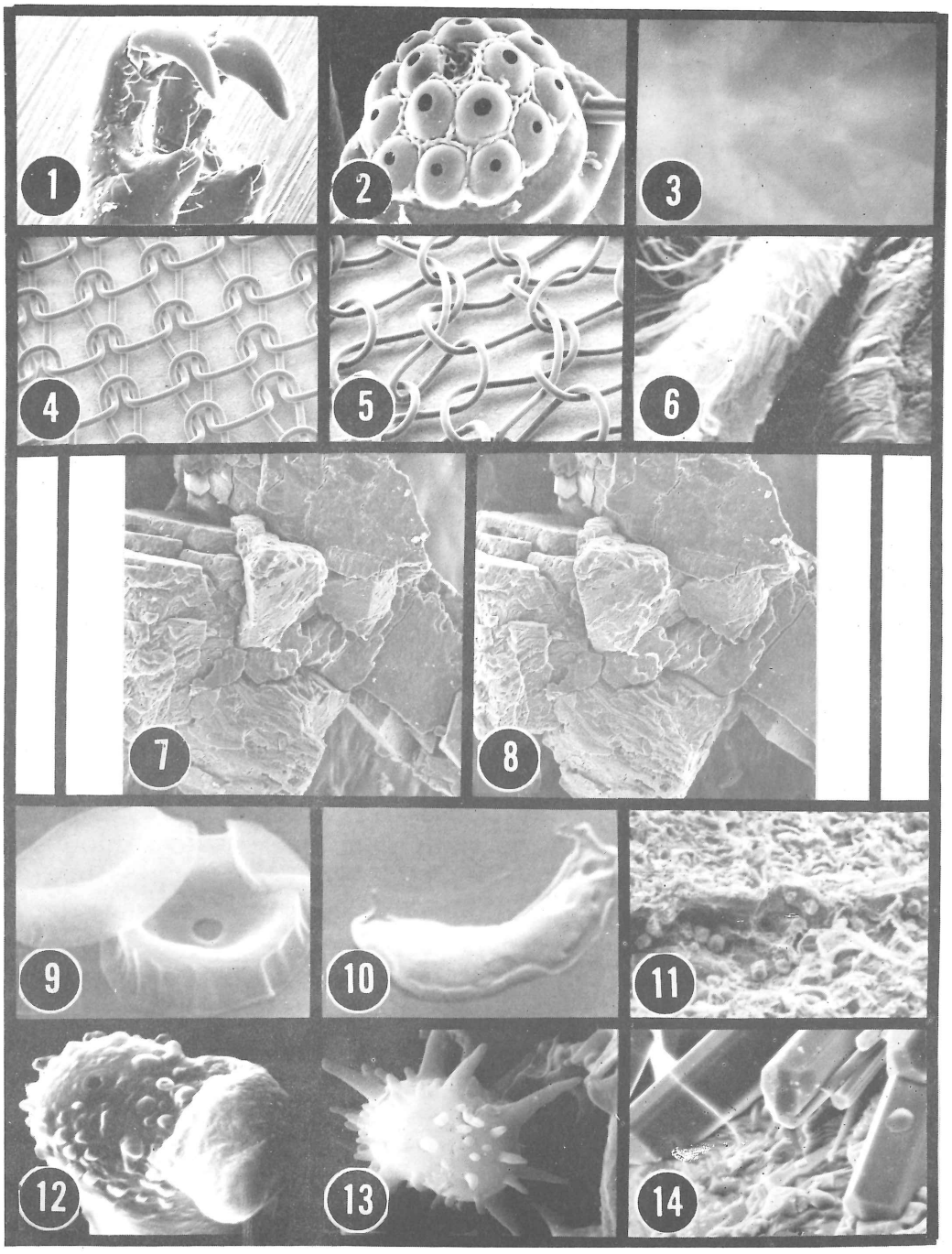
## Credits and Descriptions

Cover. Y modulation scan of cut surface of human hypertrophic scar. Two circular nodules of collagen clearly seen. Franklin Bailey and Ward Kischer, U. T. M. B.

1. Walking legs of human pubic louse, Phthirus pubis. x70. Venita Allison, S. M. U.
2. Operculum of egg, human pubic louse, Phthirus pubis. x1300. Venita Allison, S. M. U.
3. Electron channeling pattern from the fracture surface of a Mo-Re single crystal. The symmetry indicates the surface was of nearly (001) orientation. David L. Davidson, Southwest Research Institute, San Antonio.
4. Nylon stocking, regular knit. x25. Don Benefiel, Dow Chemical Co.
5. Nylon stocking, mesh knit (non-run). x25. Don Benefiel, Dow Chemical Company.
6. Collagen bundles and filaments from human scar. x2000. Franklin Bailey and Ward Kischer, U. T. M. B.

7 & 8. Stereo pair of human kidney stone (magnesium ammonium phosphate hexahydrate). x60. J. H. L. Watson, Edsel B. Ford Institute, Detroit.

9. Ion beam etching of normal human red blood cells. x5000. Linda Burns and Harold Jordan, Northrup Services, N. A. S. A.
10. Ion beam etching of red blood cells from patient with sickle cell disease. x5500. Linda Burns and Harold Jordan, Northrup Services, N. A. S. A.
11. Blood vessel with RBCs, WBCs, and fibrin from lung of burn patient, 15 minutes post-mortem. x300. Paulette Langlinais, U. S. Army Surgical Research, San Antonio.
12. Conidiogenous cell of Drechslera sorokiniana (Sacc.) Subram. & Jain showing apical pore and proliferation zone (right). x5000. Garry Cole, U. of T., Austin.
13. Mature conidia of Spegizzinia tessarthra showing irregular spiny projections. x1500. Garry Cole, U. of T., Austin.
14. Apatite crystals in a lunar rock, approximately 4 billion years old. x1800. David McKay, N. A. S. A.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# SHORT NOTES

## E.M.S.A. Meeting -- Los Angeles, August 1972

The following TSEMers were seen wandering through the halls at the recent 30th meeting of the Electron Microscopy Society of America:

E. L. Thurston*
Brenda Kay Nevels
Bob Turner
Venita Allison*
Dick Peterson*
A. Feria-Velasco*
U. G. Whitehouse*
Joe Lynn*
A. Gonzalez-Angulo*
T. P. Leffingwell*
C. R. Morris*
Joe A. Mascorro*
Nancy Arnold
Dennis Barr
John Ubelaker*
Mahlon F. Miller*
Dean Folse
Katy Miller
Marilyn Smith
Dimitrij Lang*
Tom McKee*

* presented papers

The meeting was highlighted by a panel discussion on diamond knives chaired by Dr. Diane Van Horn. This session was attended by several hundred people, many of whom had complaints ranging from petty to serious concerning the performance and quality of present day diamonds. One lady insisted E.M.S.A. procure for her some diamond dust so that she could sharpen her own knives. A committee composed of Diane Van Horn, K. G. A. Persson from LKB, J. R. Sawers from duPont, J. T. Black from the University of Vermont, and J. Evans from Ivan-Sorvall will meet to consider the question of setting E.M.S.A.-approved guidelines to govern the quality and warranties covering diamond knives as well as EM supplies in general.

## A Note Concerning the Joint Symposium

Plans for the Second TSEM/LSEM Joint Symposium are progressing just as scheduled. The program will include several guest speakers from the EMSA Executive Council which will be meeting in New Orleans in conjunction with the Joint Symposium on 8-9 February 1973. The meeting is to take place

in New Orleans's quaint and historic French Quarter. You are reminded that abstracts for platform presentations are now being solicited and are due not later than 8 December 1972. Please submit same to

Miss Linda Muller
U.S.D.A.
Southern Regional Research Laboratory
P. O. Box 19687
New Orleans, Louisiana 70179

Our LSEM colleagues are planning a stimulating and interesting meeting and are hoping for a big Texas turn-out. Let us not disappoint them.

## Welcome to the Following New T S E M Members

Garry T. Cole (Univ. of Texas)
Hilton Mollenhauer (U.S.D.A., Texas A&M)
Richard B. Bergens (N.T.S.U.)
Tom King (Scott-White)
E. R. Rivera (Univ. of Texas)
Janet Ferrillo (T.W.U.)
George A. Kahler (Rice)
Manley McGill (M.D.Anderson)
William J. Arnoult (Houston, Texas)
Donald R. Cole (Texas A&M)
William E. Haensly (Texas A&M)
Krystyna Rybicka (Texas Heart Inst.)
Lonnie Shepherd (Scott-White)
Robert F. McGregor (St. Luke's)
Ival Williams (Perkin-Elmer)
Ron McDuffie (Perkin-Elmer)
Bob Steiner (Jeolco)
Phillip J. Ives (Texas A&M)
Charlotte L. Bludreau (U.T.S.M.S.)
Jim Hayes (U.T.M.B.)
Elizabeth Payne (Vanderbilt)
Robin Cotton (S.M.U.)
Andrew M. Jones (T.C.U.)
Garnette Kelsoe (S.M.U.)
Scott Lea (Baylor Univ.)
Wayne J. Barcellona (U.T.M.B.)
Tom Croley (L.S.U.)
Brooks Myers (M.D.Anderson)
Alfredo Feria-Velasco
(Mexico City - Social Security)
Amador Gonzalez-Amgulo (M.C.-S.S
Agustin Gonzales-Licea (M.C.-S.S.)
Jack Classon (Curtin)

# AREA NEWS

## Houston

UNIVERSITY OF HOUSTON: Dr. Luther E. Franklin and Mr. Everett N. Fussell have just joined the Biology Department from the Delta Primate Center, Covington, Louisiana.

The department has also secured a Hitachi HS-8F-2 E.M.

Dr. Franklin has also received two NIH grants: "Mechanisms of Mammalian Fertilization" and "Study of Golden Hamster and Primate Spermatozoa."

Recent publications:

Talbot, P., W. H. Clark, Jr., and A. Lawrence. Light and electron microscopic studies on osmoregulatory tissue in the developing brown shrimp, Penaeus aztecus. Tissue and Cell. 4:271 (1972).

Dewel, W. C. and W. H. Clark, Jr. An ultrastructural investigation of spermiogenesis and the mature sperm in the anthozoan Bunodosoma cavernata (Cnidaria). J. Ultrastr. Res. 40:417 (1972).

Clark, W. H., Jr., R. L. Moretti, and W. H. Thomson. Histo-chemical and ultracytochemical examinations of the spermatids and spermatozoa of Ascaris lumbricoides var. suum. Biol. of Reprod. Listed for October 1972 Issue.

Talbot, P., W. H. Clark, Jr. and A. L. Lawrence. An ultrastructural study of the muscle insertions and carapace supporting epidermis in the developing brown shrimp, Penaeus aztecus. Tissue and Cell (in press).

Talbot, P., W. H. Clark, Jr., and A. L. Lawrence. Fine structure of the midgut epithelium in the developing brown shrimp, Penaeus aztecus. J. Morphology (in press).

Hinsch, G. and W. H. Clark, Jr. Comparative fine structure of Cnidaria spermatozoa. Biol. of Reproduction (in press).

Dr. Prudence Talbot who received her Ph.D. in Biology from the University of Houston in the spring of 1972 spent the summer in Dr. C. R.

Austin's laboratory in Cambridge, England. Dr. Talbot is presently starting an NIH post-doctoral term with Dr. Franklin.

Dr. William Dewel who received his Ph.D. in Biology from the University of Houston has moved to the University of North Carolina at Boone where he is an assistant professor in Biology.

M. D. ANDERSON HOSPITAL: Dr. Munemitsu Hoshino, a new member of TSEM, will be a project investigator in the Department of Virology for one year.

Mr. Carroll Nyquist of the U. S. Information Agency, visited the department on 21 February 1972. Mr. Nyquist filmed Drs. L. Dmochowski and E. Priori for the State Department (this film is to be shown outside the United States).

Mr. James Wilkinson of the London Daily Express, London, England, interviewed Drs. L. Dmochowski, J. M. Bowen and E. S. Priori on the history of the ESP-1 virus on 24 May 1972.

Mr. R. L. Hales presented an Eli Lilly film, "The Penetrating Eye", concerning scanning electron microscopy of biological materials, to the staff and personnel of M. D. Anderson Hospital on 23 May 1972.

Recent publications:

Dmochowski, L. Viruses and breast cancer. Hospital Practice. January 1972, pp. 73-81.

Dmochowski, L. Viruses and breast cancer: introductory remarks. Cancer 28(6):1404-1405. 1972.

Seman, G. H. S. Gallager, J. M. Lukeman, and L. Dmochowski. Studies on the presence of particles resembling RNA virus particles in human breast tumors, pleural effusions, their tissue culture and milk. Cancer 28(6):1431-1442. 1971.

Allen, P. T., J. M. Bowen, W. A. Newton, J. L. Ease, J. Georgiades, E. S. Priori, M. F. Miller, M. A. Nash, B. Myers, and L. Dmochowski. Molecular studies of cells derived from human solid tumors. In Molecular Studies in Viral Neoplasia, program and abstracts of papers of the 25th annual symposium of fundamental cancer research, The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston, 8-10 March 1972. pp. 55-56.

Georgiades, J., E. S. Priori, R. L. Hales, J. M. Bowen, T. T. Allen, W. A. Newton, and L. Dmochowski. Rescue of transforming activity from human osteosarcoma cells after co-cultivation with human leukemia bone marrow cells. In Proceedings of the 63rd annual meeting of the American association for cancer research. Boston, Massachusetts, 4-6 April 1972. p. 109. Abstract #434.

Dmochowski, L. Viral diagnosis: the patient and the physician. Am. J. Clin. Path. 57 (6):733-736. 1972.

Dr. L. Dmochowski has been appointed to the membership of the Sub-Committee on Virology of the World Association of Pathology Societies.

Dr. J. M. Bowen served as Chairman of the 25th Annual Symposium on Fundamental Cancer Research, "Molecular Studies in Viral Neoplasia", 8-10 March 1972. The symposium was attended by 1,227 persons and several hundreds of students.

Dr. J. M. Bowen has been asked by Dr. Thomas Matney, Associate Dean of the Graduate School of Biomedical Sciences, to enlarge his role as Assistant Graduate Advisor for Microbiology and Virology to include coordination of the ultrastructure program.

Dr. Richard G. Peterson, Neurobiology Section of The University of Texas Medical School, has two papers in press:

Peterson, Richard G. and Daniel C. Pease. Myelin embedded in polymerized glutaraldehyde-urea. J. Ultrastructure Research.

Pease, Daniel C. and Richard G. Peterson. Polymerizable glutaraldehyde-urea mixtures as polar, water-containing embedding media. J. Ultrastructure Research.

ST. LUKE'S HOSPITAL: Marilyn Smith, Department of Pathology, reports that Dr. Hector A. Rodriguez Martinez, who is a Professor of Pathology at the University of Mexico and a surgical pathologist at the General Hospital of Mexico, visited in the Pathology Department of Dr. Carl J. Lind at St. Luke's Episcopal Hospital in Houston for the month of August in order to do continuing research in electron microscopy of nevi and hair papillae.

Dr. Rodriguez was delighted with the performance of the Siemens Elmiskop 101 in this laboratory; and in addition, he was pleased to have passed on to him the large amount of information pertaining to electron microscopy

that is circulated through the Newsletter and meetings of the TSEM. We will be expecting several papers from the work he has completed here.

RICE UNIVERSITY: Lea Rudee has returned from a year as a Guggenheim Fellow at the Cavendish Laboratory, University of Cambridge, Cambridge, England. While there he worked with Archie Howie on theoretical and experimental studies of the interpretation of electron micrographs and diffraction patterns of amorphous materials. This work will be continued at Rice as part of a Welch Foundation grant to study the structural chemistry of amorphous semiconductors.

Mr. Robert Seibert, formerly with Perkin-Elmer Corporation, has accepted a new position with Ladd Industries. He is the Assistant to the President. He has moved to Vermont already in time for the coming ski season.

Galveston

UNIVERSITY OF TEXAS MEDICAL BRANCH: The new ultrastructure section of the Division of Cell Biology is nearing completion and Drs. Bill Brinkley and Jeffrey Chang expect to be in operation by mid-November. The new facility consists of a large histochemistry lab, tissue preparation lab, microtome area, and light microscope time-lapse cinematography lab. Two identical darkrooms are accessible through a rotary dark-trap door. The facility will contain a new Philips EM 300 and an EM 201. The Tissue Culture - Cell Kinetics section will be completed later this fall and will be directed by Dr. Sam Barranco.

New members of the group include Dr. James Lindsey, Senior Research Associate, who will work jointly with Dr. Brinkley and Dr. Emil Steinberger (U. T. Houston) on a project concerning the ultrastructural changes in rat Sertoli cells under various hormonal conditions. Dr. Lindsey received his Ph. D. with Dr. John Biesele at the U. T. in Austin.

Mr. Robert Pardue recently joined the group as Research Technician and will also work on the Sertoli project. Bob recently received his M.S. degree from North Texas State University, Denton, Texas.

Mr. David Hom joined Dr. Chang's group in September to work as a Research Technician. David recently received his B.S. degree in Biology from U. of H.

Oh yes, when Dr. Jeffrey Chang returned from his extensive tour

of Asia this summer, he wore an unusually large grin. It seems that while in Taiwan, Jeff participated in a very special wedding -- his own! Mrs. Chang, a beautiful native of Taiwan will join her husband in December. Congratulations, Jeff! What are you going to do with all that fishing tackle?

Department of Anatomy: Dr. Donald Duncan reports that Hilton Mollenhauer is returning to Texas. He will be in a U.S.D.A. virus laboratory at A & M.

Borger

The J. M. HUBER CORPORATION Has installed a closed-circuit television system for their Philips EM 300.

San Antonio

Dr. David L. Davidson, SOUTHWEST RESEARCH INSTITUTE, reports installation of an ETEC scanning electron microscope with Wavelength Dispersive Spectrometer and accessories.

Dallas

A new AMR Scanning E.M. has been acquired by the BAYLOR COLLEGE OF DENTISTRY. Dr. Wayne Sampson, a new member to TSEM has recently received a grant from NIH for studies on mineral transport in teeth and soft tissues.

Dr. James L. Matthews was invited to lecture at the Ciba Foundation in London at the Conference on Bone and Connective Tissue, as well as a guest lecturer at Oxford University, Osford, England, and Cambridge University, Cambridge, England, this past summer. He was also a visiting foreign research director, on a fellowship from the French National Academy of Science, and worked at the Hopital des Enfants Malades at Paris, France, for a month this past summer.

Recent publications:

Sampson, H. W. and J. L. Matthews. Electron microscope autoradiographic investigation of $^{33}P$ in the intestinal epithelium of rachitic, normal, and vitamin-D-treated rats. Calc. Tiss. Res. 10:58-66. 1972.

UNIVERSITY OF TEXAS AT DALLAS: Carla Gray has received an NIH postdoctoral fellowship on transcription of viral DNA in mammalian cells.

Recent publication:

Gomez, B. and D. Lang. Denaturation map of T-7 DNA and direction of transcription. J. Mol. Biol. (in press).

SOUTHERN METHODIST UNIVERSITY: Mr. Garnette Kelsoe, graduate student in the Department of Biology is a new member of TSEM. Venita Allison reports a substitute for critical point drying for scanning EM in a publication entitled:

Allison, V. Preparation of helminths for scanning electron microscopy. J. Parasitology 58:414. 1972.

Allison, V.F., J. E. Whitaker and J. H. Martin. Comparative study of the fine morphology of sensory receptors in Aspidogaster conchicola and Catylaspis inrignis. In 30th Ann. Proceed. Elect. Micros. Soc. Am. Los Angeles, California.

Whitaker, J. E. and V. F. Allison. Scanning electron microscopy of the denticles and eggs of Ascaris lumbricoides and Ascaris suum. In 30th Ann. Proceed. Elect. Micros. Soc. Am., Los Angeles, California.

Allison, Venita F., John E. Whitaker, and Nancy B. Cooper. The fine structure of the Cysticercae Hymenolipis diminuta. II. The inner wall of the capsule. Z. Parasitark. 39:137. 1972.

New Orleans

TULANE UNIVERSITY: Department of Anatomy has received a new Siemens Elmiskop 101.

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## CORPORATE ADVERTISMENTS

[Editor's Note: The Newsletter would like to sustain and improve the format as presented with this issue. We can do this only by selling advertising. This will include the inside front cover and the outside and inside of the back cover. Each will be full pages. This offers corporations the added opportunity for photographic presentation in their ads. If the response is good to this offer we may include a center ad page. We feel the charge is relatively nominal. For you corporate members, please bear in mind our circulation with each issue is now over 300 in Texas, with other copies sent to the Officers of EMSA, some members in the Louisiana Society and a scattering sent to other areas of the country. For further information please write directly to the Editor or call 713-765-1809.]

## CARL ZEISS, INCORPORATED

CARL ZEISS, INC. has introduced a new high resolution electron microscope designated ZEISS EM 10. Some of its features are: 3.5 A guaranteed point-to-point resolution; accelerating voltages 40, 60, 80, and 100 kV; magnifications from 100x to 200,000x; camera system and vacuum system fully automatic. The ZEISS EM 10 is offered in addition to the well-known ZEISS EM 9S-2.

## ETEC CORPORATION

The MAC 5, a computer-controlled electron microprobe analyzing system, and MAC's shielded probe -- the only one of its kind in the world -- will be valuable additions to Etec's Autoscan SEM product line. Etec Corporation introduced its advanced scanning electron microscope, Autoscan, in April of 1971. Since then Etec has become the leading U. S. manufacturer of scanning electron microscopes. In January of this year Etec concluded an agreement with Siemens AG of West Germany for exclusive sales distributorship in all countries of the world except the United States, Canada, and Mexico.

## ADVANCED METALS RESEARCH CORPORATION

The Application Lab is pleased to inform you of our analytical services. At the present time, we offer services in Scanning Electron Microscopy, Microprobe Analysis, and X-Ray Diffraction Analysis.

The Scanning Microscopy utilizes an AMR-900 SEM. This instrument is equipped with a non-dispersive x-ray analyzer. The cost for SEM services is $50.00 per hour. This includes instrument, operator, and all film expenses. There is no minimum charge and no limit on the number of micrographs per hour. The micrographs can be obtained using either Polaroid Type 52 (Positive) or Type 55 (Positive and Negative).

In the field of Microprobe Analysis, we offer the use of two AMR-3 Microprobes. The capability of these instruments includes the analysis of all elements from B (Z = 5) to U (Z = 92) in the periodic table. The cost is generally quoted on a job basis and averages between $250.00 to $350.00 per day.

X-Ray Diffraction studies are conducted with a Norelco Diffractometer. The cost is $75.00 per sample.

## ERNEST F. FULLAM, INCORPORATED

Ernest F. Fullam, Inc., now offers a new style of electron microscope grid. The 135 mesh Fullam Finder Grid is scannable in a straight line with each opening of the grid identified by letters and numbers A very light plating of rhodium identifies the underside of the grid, while the very flat specimen surface is copper.

A second new pattern is the Fullam Freeze Etch Grid, a standard 200 mesh grid with four large central squares. Each large square is equivalent to four squares of a 200 mesh opening. The underside is rhodium plated for both identification and stability.

All of the standard meshes up to 400 mesh are available with the rhodium plated identification side.

# PLACEMENT SERVICE

## POSITIONS WANTED

Teaching and Research Position. Ph.D. Rice University, 1971, Cell Biology. thesis advisor, Dr. Charles W. Philpott, electron microscopy, cytochemistry. US PHS post-doctoral fellow 1971. Presently at Brown University with Dr. Richard A. Ellis. Desires position in Houston-Galveston area. Available May 1973. Contact Dr. Peter C. Moller, Research Fellow, Brown University, Providence, Rhode Island 02912.

Senior EM Technician. Female. Twelve years of experience in all aspects of biological electron microscopy. Supervisory experience in the operation and maintenance of EM laboratory, tissue culture, histology. Certified Medical Histologist. Would like to relocate in Texas (Austin, Dallas, Fort Worth, or Houston). Available in fall or winter. Contact Charlotte L. Boudreau, 20 Pine Avenue, Randolph, Massachusetts 02368. Phone 617-963-9517.

Senior Research Scientist. Male. M.S. Biology. Twelve years experience in all aspects of electron microscopy, virology, tissue culture, and biochemistry. Salary range desired: $13 - 15,000 per year. An unusually qualified individual. Desires position in the Houston-Galveston area. Available immediately. Contact Placement Service, ask for #1.

EM Technician. Female. Experienced in all aspects of electron microscopy, microtomy, darkroom procedures, histology, histochemistry, and tissue culture. Desires work in the Houston-Galveston area. Available immediately. Contact Placement Service, ask for #2.

## POSITIONS AVAILABLE

Experienced Tissue Culture Technician to work in new laboratory. Must have experience with mammalian cells in vitro and a B.S. or M.S. degree. Excellent career opportunities. Contact Dr. Sam Barranco, Associate Professor of Biology, Division of Cell Biology, The University of Texas Medical Branch, Galveston, Texas 77550. Phone 713-765-2761 (Galveston) or 713-526-5411, ext. 256 (Houston).

TEXAS SOCIETY FOR ELECTRON MICROSCOPY

NEWSLETTER

Volume 4 Number 1

Fall 1972

Supplement 1

# BY — LAWS

# BY-LAWS

# of the

# TEXAS SOCIETY FOR ELECTRON MICROSCOPY

## I. PURPOSE

The purpose of this Society shall be to increase and diffuse the knowledge of electron microscopes and related instruments and results obtained through their use in whatever fields they may be found to be applicable, and to promote fellowship and free exchange of ideas among the members.

## II. MEETINGS

Meetings of the Society shall be held at such times and places as may be designated by the Executive Committee. There shall be a minimum of three meetings per year, one of which shall be a general symposium.

## III. OFFICERS

A. The officers of the Society shall be a president, president-elect, secretary, treasurer, and program chairman.

B. The current officers and the immediate past-president shall constitute the executive committee and the program committee and shall appoint a newsletter editor who shall also serve as a member of these committees.

## IV. DUTIES

A. The president shall preside at all business meetings of the Society and at the meetings of the executive committee.

B. The president-elect shall substitute for the president in his absence, and shall perform such duties as assigned by the president.

C. The secretary shall maintain the records of the Society, other than financial, and promulgate announcements to the membership.

D. The treasurer shall be custodian of the Society funds and shall account for them in accordance with accepted business practice.

E. The program chairman shall be responsible for organizing the various learned undertakings of the Society and shall preside at the meetings of the program committee.

## V. DUES

A. The amount of annual dues and the date(s) of payment shall be set by the executive committee.

B. Any member that is delinquent in payment of dues for a period of six months shall be removed from membership.

## VI. ELECTIONS

A. In February of each year the executive committee shall appoint four members, other than officers, to nominate one candidate for the various offices for the next year. The secretary shall serve as chairman of the nominating committee.

B. The nominating committee shall prepare their slate of nominees with due consideration to the geographical areas and fields of interest represented by the membership of the Society.

C. Nominations may be initiated by the membership by petition to the executive committee signed by at least five per cent of the members in good standing.

D. Ballots shall be mailed to the membership in March and shall be accepted by the executive committee until the fifteenth of April. The results shall be announced by the secretary no later than the first day of May. The new officers shall assume office on the first day of June.

E. The candidate receiving over one-half of the votes on the ballots actually received shall be the winner. If more than two candidates are running for an office, the ballots shall be so arranged that the membership ranks all candidates in order of preference. If, on the first count, no candidate receives a majority vote, the ballots of the candidate receiving the lowest number of votes shall

be recounted with the second choice now counting as first choice votes, and so forth, until only two candidates remain.

In the event of a tie vote, the combined executive and nominating committees shall decide the winner.

The ballots shall be counted by the executive committee.

VII. AMENDMENTS

A. Amendments to these by-laws may be initiated in two methods:

1. By the executive committee, or by

2. Petition of ten percent of the members in good standing.

B. The proposed amendment shall then be promptly submitted by mail to the membership by the secretary with signed statements of support and/or opposition. The ballots shall be accepted by the executive committee for two weeks after the date of mailing. The executive committee shall count the ballots and the amendment shall be ratified if it receives a favorable majority of the votes cast.

VIII. Any member in good standing can, if he so desires, be present at the counting of any ballots.

IX. These by-laws shall be ratified by majority vote of those present at the organizational meeting.


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