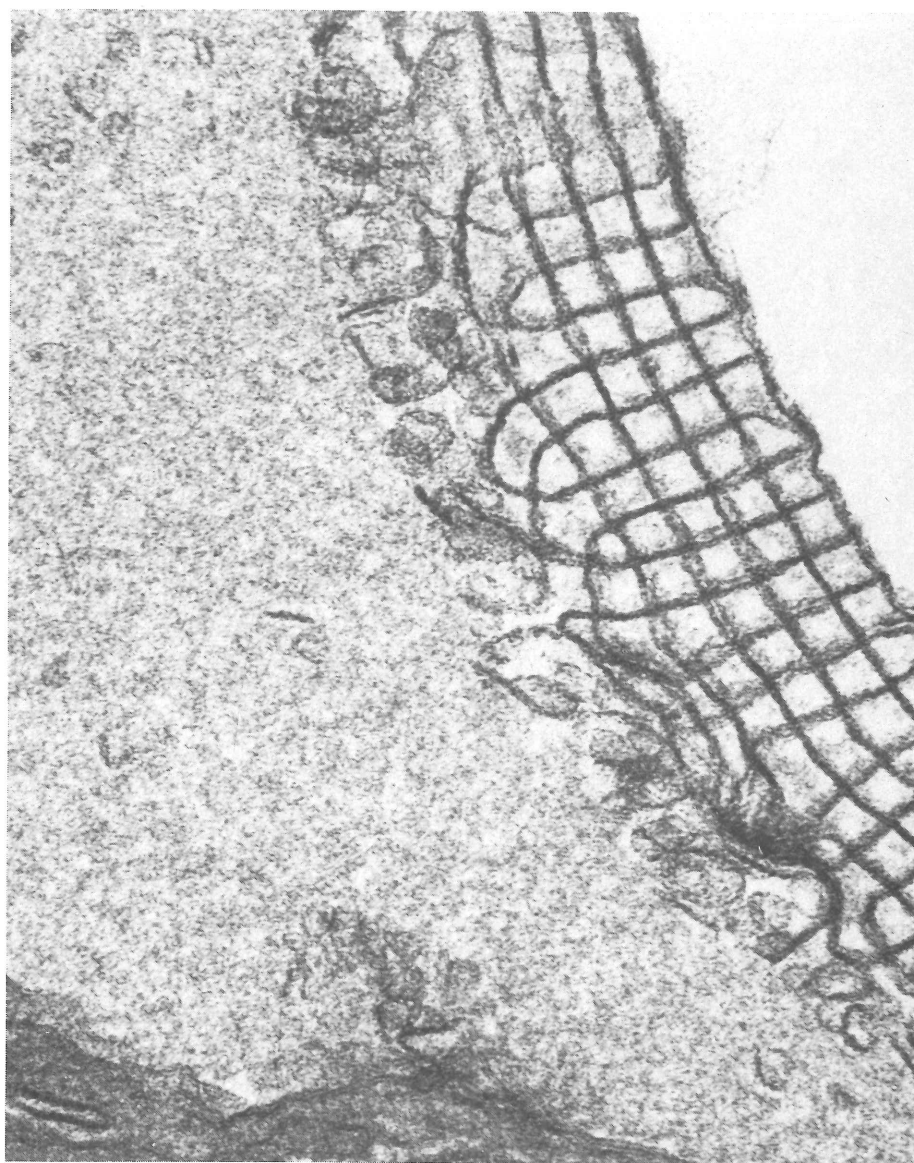
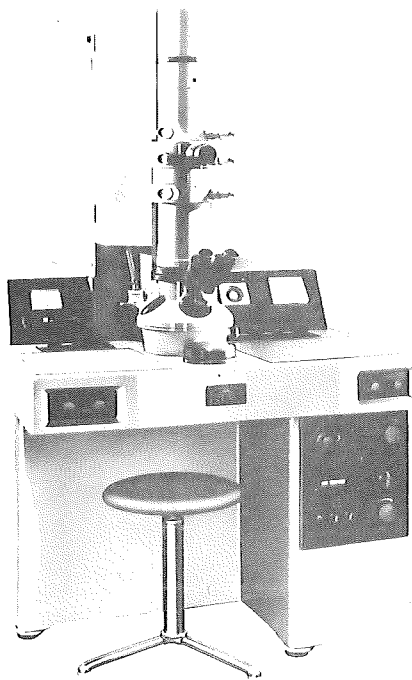


TSEM Texas Society for Electron Microscopy
e⁻ NEWSLETTER



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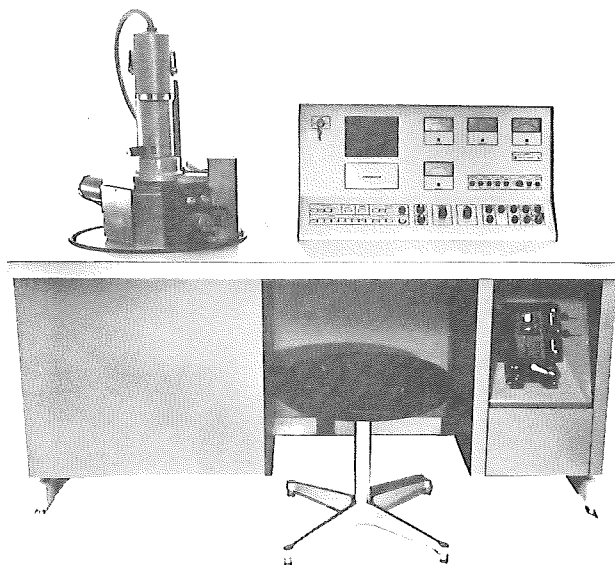
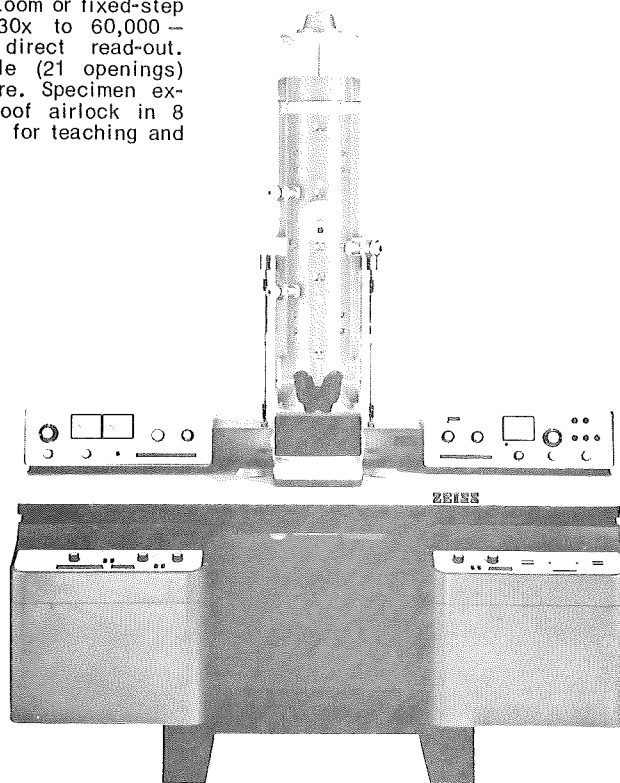


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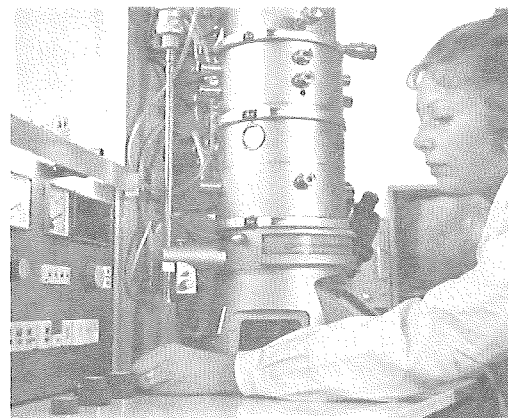


*Robert L. Allen
1110 South Main
Houston, Texas*

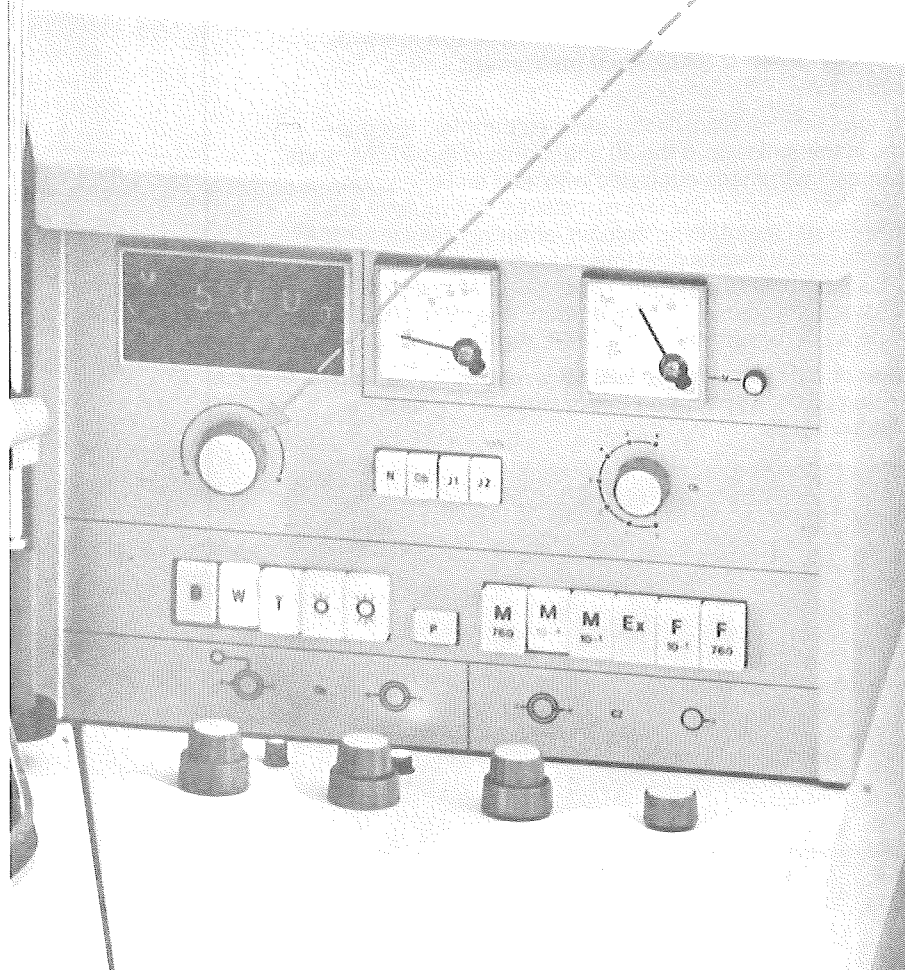
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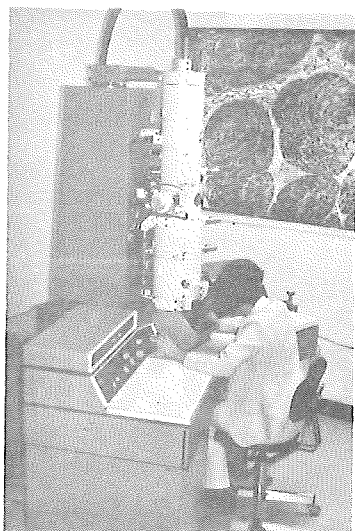
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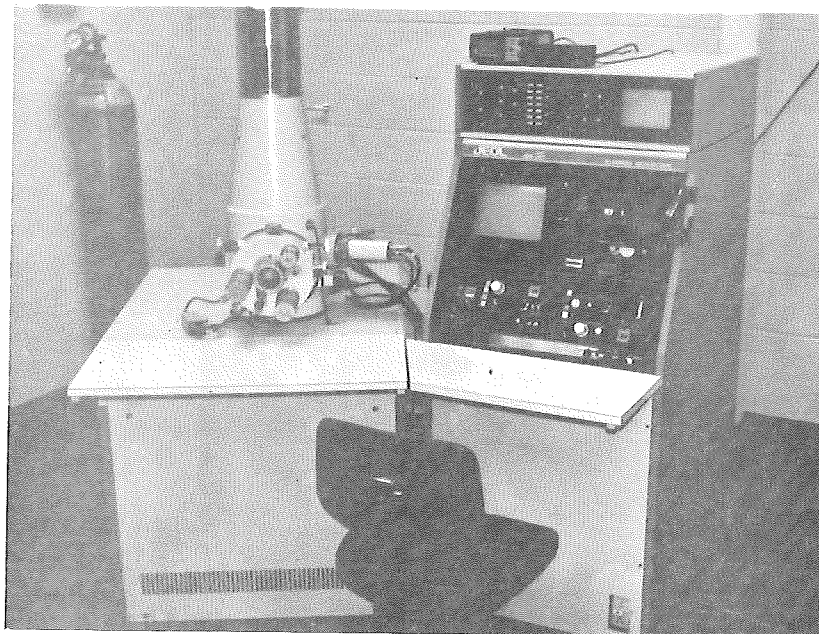


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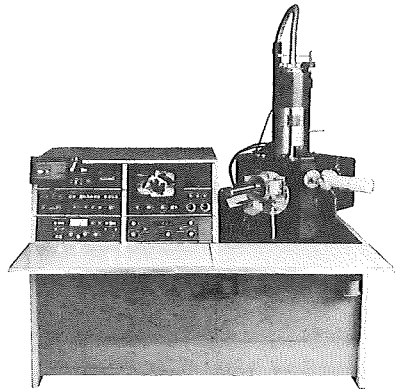
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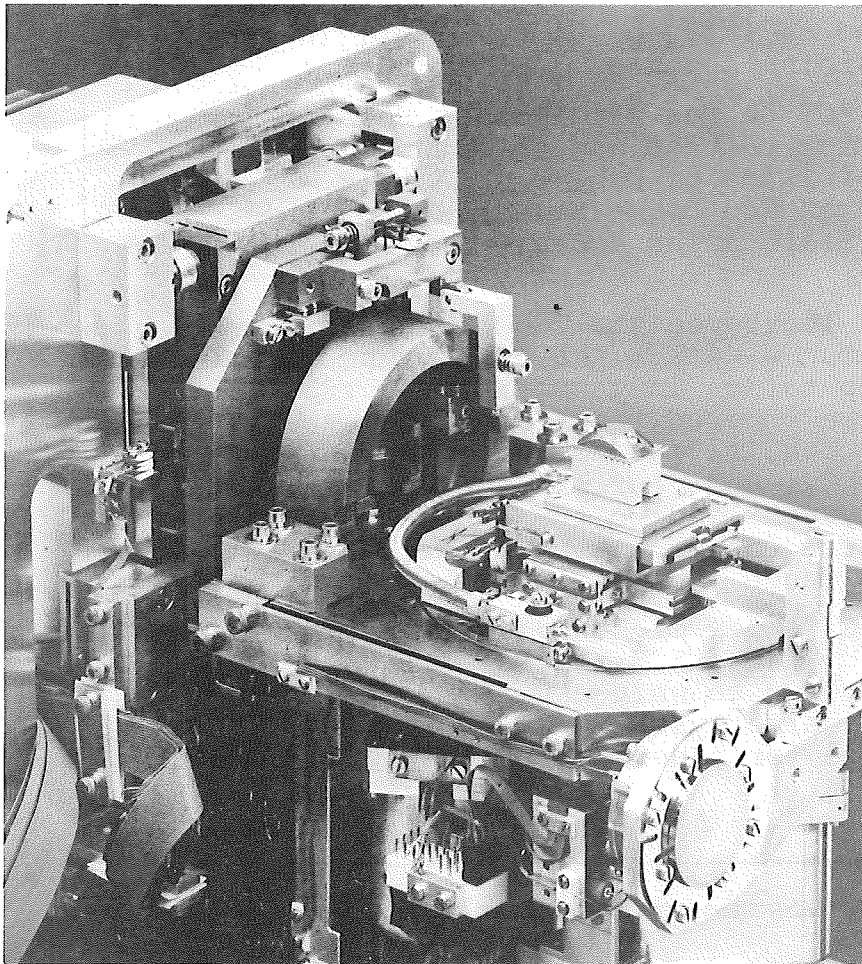
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Memo to: The TSEM Membership
From: Princeton Gamma-Tech
Subject: PGT's Southwestern Sales Rep -- Dick Neiman

Dick Neiman, who joined the PGT sales staff last December, moved back to Texas last month. We had planned to introduce him but he is already known to many members of TSEM. He joined the society in 1965 and was, in fact, one of its first sustaining members.

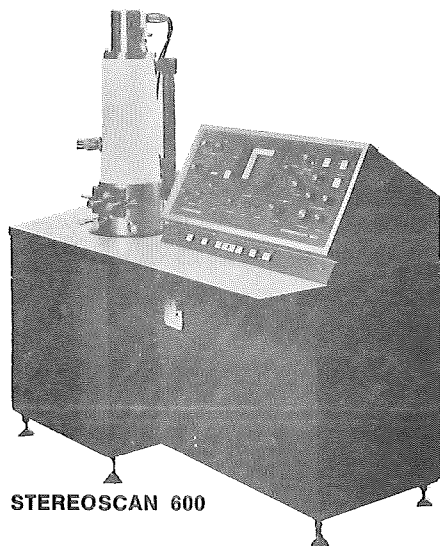
Before coming to PGT he was X-ray Sales Manager for Tracor Northern and prior to that was with the Analytical Business Measurement Division of General Electric. From 1959 to 1965 he served as Southwest Sales Rep for Philips Electronics and Texas State Sales Manager for Picker X-ray Corporation.

We hope Dick will introduce the TSEM membership to PGT. In little more than a decade the company has established a world-wide reputation in gamma-ray spectroscopy. A number of years ago we entered the X-ray fluorescence market as the first commercial manufacturer to install a Si(Li) detector on a SEM. And, our expertise in the field of energy dispersive systems led to the development of the PGT-1000 X-ray Analyzer - one of the best multichannel analyzers in its price range.

Dick Neiman and PGT's new microanalysis system will be on hand for the February TSEM/LSEM meeting in San Antonio. But TSEM members don't have to wait until 1976 to see this innovative and comprehensive system. Give Dick a call at 713 225-6160 and arrange for a demonstration now. Remember he's a neighbor.

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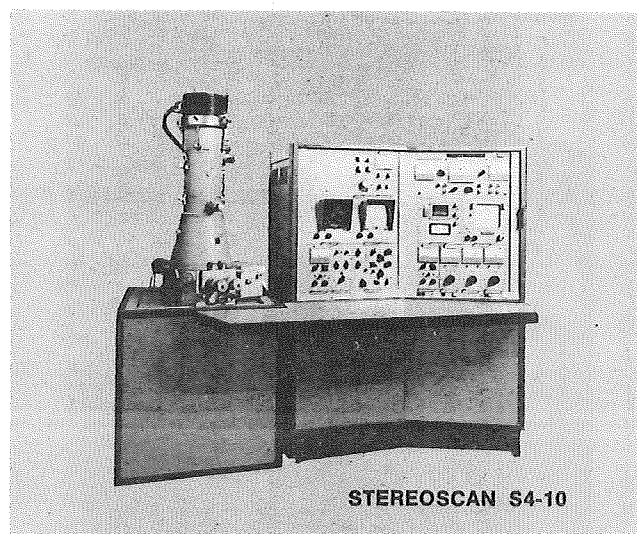


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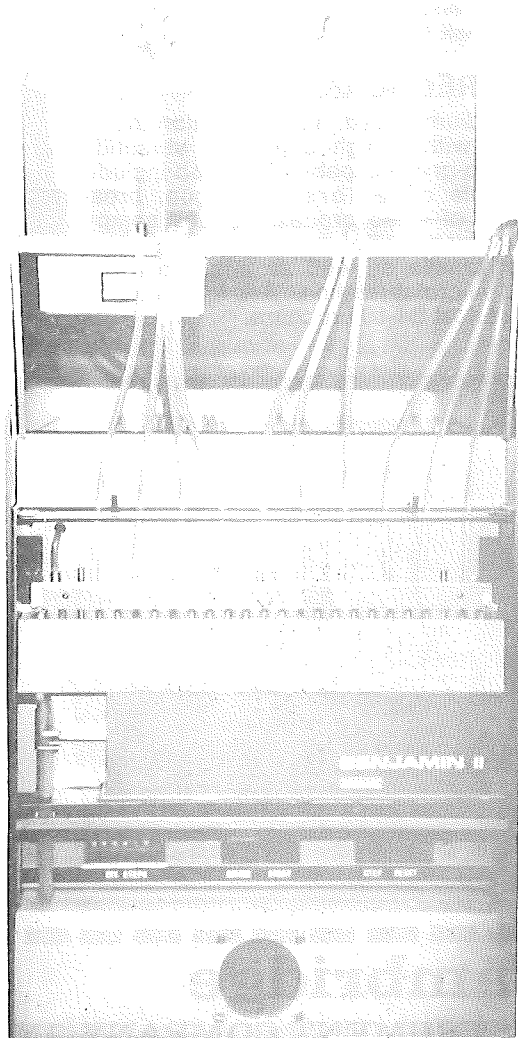
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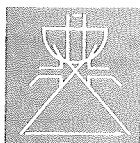
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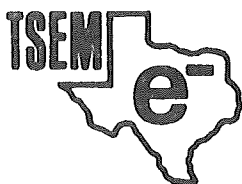
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WITH THE ELECTRON MICROSCOPE ”

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VOLUME 6

NUMBER 2

FALL 1975

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FINANCIAL REPORT

Period ending September 1, 1975

Receipts:

Dues and Registration	
Regular and student members (208 paid)	1440.00
Corporate Support	650.00
Corporate dues	850.00
E.M.S.A.	300.00
Newsletter	<u>350.00</u>
subtotal	3590.00

Disbursments:

Newsletter	290.07
Other expenses	<u>3240.84</u>
subtotal	3530.91

Summary:

Bank balance (checking) April 7, 1975	2756.37
Bank balance (checking) September 1, 1975	2815.46
Certificate of deposit	<u>1110.66</u>
grand total	3926.12

PRESIDENT'S MESSAGE

In August I attended the EMSA meeting (or should I say gala affair) in Las Vegas. I can't deny it was fun in Vegas. Neither can I deny some sense of apprehension wrought by the frivolous air with which some people regard science, especially by those in the field. This feeling was compounded by three consecutive "no shows" in the session I chaired. Neither I nor anyone else received proper cancellation notice by any of the authors, which were nine in number.

My thoughts then turned to Bandera and the flavor of a Dude Ranch setting which could be misleading with respect to the attitude towards science by members of our Society. As one member put it when I discussed our desire for good scientific presentations: "A Dude Ranch is hardly the place for that!" Agreed, in principle, but not in fact. On the contrary, it is perhaps just the place to make the most of an opportunity for continued exchange without the constriction of 15 minute limits, split sessions or meeting rooms.

In spite of this we must be aware of the possibility of promoting a false image of a "party" Society. For our Galveston meeting of more than two years ago I had prepared a letter concerning the Society and its image to be read at the business meeting. I decided not to read it at that time, but now offer excerpts from that letter as *apropos* to my current concern:

..."Approximately one-third of the annual paid membership usually attends our in-state meetings. Unless we provide a continuing and compelling reason which will encourage and sustain attendance and participation from our members the Society may be in danger of decaying through disinterest. I submit it should not be necessary to plan a meeting almost exclusively devoted to social functions; nor, should a meeting program be devoted entirely to listening to outside speakers. There are many able and available scientists from within our own organization. Let's get them to participate.

...I believe it is time the membership at large of the Society be called upon to work actively for the Society and that we strive to identify more solidly with scientific excellence and interchange... We may have lost a continued participation in our meetings from the older and more established scientists by not properly emphasizing hard-nosed scientific input."

In the months to come I will be offering to the membership and to our Executive Committee sessions, plans to strengthen a scientific excellence identity for TSEM. I welcome and invite any and all suggestions and input from the membership. I shall act on your suggestions - I promise you.

Ward Kischer

REGIONAL EDITORS

The following people are presently serving on the TSEM Newsletter editorial board and as regional editors.

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EDITORIAL

This Newsletter is compiled, printed, and distributed to convey news, solicit opinions, advertise, and deliver topics of interest to Society members. The Editor is to select, correct, and arrange submitted materials into a creditable monograph. A fundamental principle involved in this process is communication. As a Society, we must be willing and able to communicate with each other if we are to attain the credibility to which we aspire.

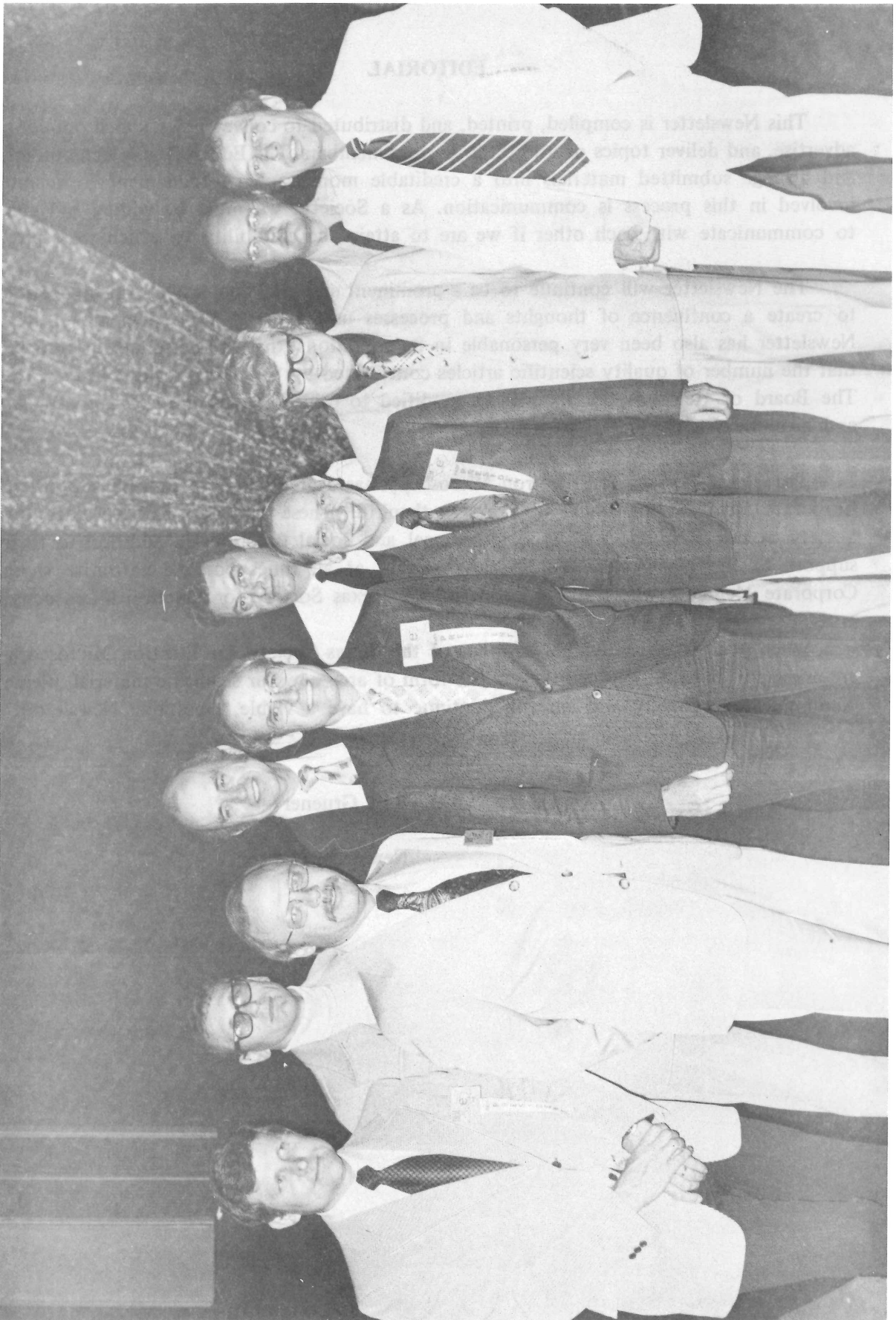
The Newsletter will continue to be a prominent and vital tool which can be utilized to create a confluence of thoughts and processes useful to all Society members. The Newsletter has also been very personable in its operations; this will continue. It is hoped that the number of quality scientific articles contributed by the membership will increase. The Board of Regional Editors will be modified to bring forward more active persons, and give them a chance to participate.

The Texas Society for Electron Microscopy has a great number of very supportive Corporate Members for which we are very thankful. These corporations have aided the Society at our meetings via support for meal and social functions in addition to their support to the Newsletter. We, in turn, should at all times possible patronize those Corporate Members who are supportive of the Texas Society for Electron Microscopy.

When you as an individual member of the Texas Society for Electron Microscopy are asked for contributions, be they in the form of area news or scientific material, please communicate positively and we will continue to have a viable, creditable Newsletter.

Ron Gruener

Newsletter Editor



College Station

TEXAS A&M UNIVERSITY

Tom McKee and Phil Ives, Texas A&M graduate students, were each awarded an Electron Microscopy Society of America Presidential Scholarship at the recent EMSA meeting in Las Vegas.

Nick Norton, recent Texas A&M graduate, was awarded the Outstanding Graduate Student Dissertation Award at the recent AIBS meeting. Nick will now begin a post-doc study at Baylor College of Medicine with Dr. Ierachmiel Daskal in the Department of Pharmacology.

Texas A&M Electron Microscopy Center Director, Dr. Larry Thurston, has been named Editor of the Electron Microscopy Society of America Bulletin.

Dallas-Ft. Worth

THE UNIVERSITY OF TEXAS SOUTHWESTERN MEDICAL SCHOOL

Department of Cell Biology

Grants Awarded:

Dr. Jerry Shay has recently joined the faculty of the Cell Biology Department and has been awarded a \$15,000 grant from the Muscular Dystrophy Association of America to study "Enucleation and Fusion of Muscle Cells."

Dr. Leonard Seelig has joined the faculty of the Cell Biology Department as an assistant professor of Cell Biology.

Katy Hammon has returned to work in Dr. Hackenbrock's lab following a short stay in Killeen, Texas.

Department of Pathology

New Equipment:

Dr. L. Maximilian Buja's laboratory is gearing up for analytical electron microscopy. An ASID (high resolution scanning device) has just been installed on their JEOL 100-C. In September the microscope will also be equipped for energy dispersive x-ray spectrometry with a Kevex lithium-drifted silicone detector and a Tracor Northern NS-880 x-ray analyzer.

TEXAS CHRISTIAN UNIVERSITY

For those wishing to correspond with Dr. Ernest Couch, here is his new address:

Ernest F. Couch, Ph.D.
c/o Zen Itoh, M.D., Ph.D.
Department of Surgery
Gunma University Medical School
Maebashi, Japan

El Paso

THE UNIVERSITY OF TEXAS AT EL PASO

New staff member in the Biological Sciences is Mr. Benjamin Rosario, Electron Microscopy Technician.

UTEP is presently offering a Masters Program including training on the Zeiss EM 10, Denton Freeze Etch, tissue preparation and darkroom techniques. They will be moving into a new facility in 1976. For information about programs, teaching assistantships, and fellowships, please contact:

Dr. Joanne T. Ellzey
Biological Sciences
The University of Texas at El Paso
El Paso, Texas 79968

Galveston

THE UNIVERSITY OF TEXAS MEDICAL BRANCH

Department of Anatomy

Welcome to new member Chuck Severin in the Department of Anatomy. Chuck comes from St. Louis University and will be working in E.M. tracings of terminations of basal ganglia.

Dr. Donald Duncan, Ashbell Smith Professor of Anatomy, has returned from six months of lecturing at the Stanford School of Medicine.

Department of Human Biological Chemistry & Genetics

1. First two Ph.D.'s graduated from the Division of Cell Biology.

Steve Barham (Supervising Professor, B. R. Brinkley). Steve is post-docking with Dr. Larry Deaver at Los Alamos Scientific Laboratory.

C. T. Lin (Supervising Professor, J. P. Chang). Thomas is with the Pathology Department of the University of Taiwan Medical School, Republic of China.

Their dissertations won 2nd (C.T.L.) and 3rd (S.B.) place research awards in the National Student Research Forum.

2. As chairman of the program committee, Bill Brinkley is extremely busy in organizing the program for the First International Congress on Cell Biology to be held in Boston, September 1976.
3. Three recent publications in *Science* (see list following).
4. Bill Brinkley, G. M. Fuller and Sam Barranco are leaving for Europe for meetings and lecture tours.

Bill is chairing sessions on: "Functional Aspects of Microtubules: at the International Symposia on Microtubule and Microtubular Inhibition at Beerse, Belgium. He and Jerry will also present papers at the Symposium.

On September 6-11, Bill Brinkley, Manley McGill and Jerry Fuller will participate in the Coldspring Harbor Symposia on Motility in New York.

Current Grants and Contracts:

1. Two projects from a program project research (The Basic Defect in Cystic Fibrosis) from NIH.
 - A. Ultrastructural and Histrochemical Studies of Cystic Fibrosis Cells and Tissues. (B. R. Brinkley, J. P. Chang, P. S. Baur)
 - B. Growth and Cytokinetic Studies of Cystic Fibrosis Cell *In Vitro*. (S. C. Barranco)
2. "Feasibility Studies of Cell Culture Bioassay System for Screening Toxic Mutagenic and Carcinogenic Compound" (B. R. Brinkley) from DOW Chemical Company.
3. "Studies of Mitosis in Normal and Neoplastic Cells" (B. R. Brinkley) from NIH.
4. "Drug Sensitivity of Mammalian Cells in Plateau Phase" (S. C. Barranco) from NIH.
5. "Cell Cycle and Response of Tumor Cell to Chemotherapy" (J. P. Chang) from NIH.
6. "Ultrastructural Studies of Hypertrophic Scars" (P. S. Baur) from Shriners Burns Institute.

New Faces and Notes:

Dr. Clark C. Bowen, Professor from Iowa State University is visiting us for one year and will be doing research on chromosomes and microtubules with Bill Brinkley. Dr. Bowen is the former major professor of Dr. Jerry Berlin and has taught several TSEM members who formerly attended Iowa State.

Masao Yokoyama, M.D. and Peter Moller, Ph.D. are joining Jeffrey Chang's laboratory. Both are former TSEM members. Masao is working on the cystic fibrosis project and Peter is working on the oncology project. Happy homecoming!

John W. Fuseler, Ph.D. from Woods Hole is joining Bill Brinkley's laboratory as research associate. Jerry Fuseler will be studying the physical properties of the spindle in mammalian cells using polarizing optics.

Paul Baur is busy with his new toys; the addition of computers and x-ray microanalytical equipment to his SEM.

Jim Lindsey started his Medical School curriculum at UTMB.

Manley McGill is invited to speak on "Assembly of Microtubules from Bovine Brain Tubulin" and on "Chromosomes and Centrioles from Lysed HeLa Cells" at the Cold Spring Harbor Symposium on Motility on September 6-11.

Publications:

Three papers in *Science*:

1. Fuller, G. M., Brinkley, B. R. and Boughter, M. Immunofluorescence of Mitotic Spindles by Using Monospecific Antibody Against Bovine Brain Tubulin. 187:948-950, 1975.
2. Brown, A. M., Baur, P. S. and Tuley, F. H. Phototransduction in *Aplysia* Neurons: Primary Event is Calcium Release from Pigmented Granules. 188:157, 1975.
3. Lin, C. T. and Chang, J. P. Electron Microscopy of Albumin Synthesis. (In press).

Papers and Books in Other Journals:

Baur, P. S., Clark, R. S., Walkinshaw, C. H. and Scholes, V. E. Uptake and Translocation of Elements from Apollo 11 Lunar Material by Lettuce Seedlings. *Phyton*, 1974.

Baur, P. S. and Walkinshaw, C. H. Fine Structure of Tannin Accumulations in Callus Cultures of *Pinus elliotti* (Slash pine). *Can. J. Bot.*, 1974.

Thurman, G. B., Baur, P. S. and Goldstein, A. L. Examination of Lymphocyte Membranes of Athymic "nude" Mice by Scanning Electron Microscopy. *New York Acad. Sci.*, 249:154-165, 1975.

Larson, D. L., Baur, P. S., Linares, H. A., Willis, B., Abston, S. and Lewis, S. R. Mechanisms of Hypertrophic Scar and Contractive Formation in Burns. *Burns*, 1975.

Baur, P. S., Larson, D. H. and Stacey, T. R. The Observation of Myofibroblasts in Hypertrophic Scars. *J. of Surgery, Gynecology and Obstetrics*, 141:22, 1975.

Baur, P. S., Thurman, G. B. and Goldstein, A. L. Reappraisal of Lymphocyte Classification by Means of Surface Morphology. *J. Immunology*. (In press).

Brinkley, B. R., Fuller, G. M. and Highfield, D. H. Cytoplasmic Microtubules in Normal and Transformed Cells in Culture: Analysis by Tubulin Antibody Immunofluorescence. *Proc. Nat. Acad. Sci. USA*. (In press).

Brinkley, B. R., Fuller, G. M. and Highfield, D. H. Cold Spring Harbor Conference on Cell Proliferation, Vol. 3, Cell Motility. (In press).

Brinkley, B. R. and Cartwright, Jr., J. Cold Labile and Cold Stable Microtubules in the Mitotic Spindle of Mammalian Cells. *Ann. N. Y. Acad. Sci. USA*, 253:428, 1975.

Brinkley, B. R. and Hittleman, W. N. Ultrastructure of Mammalian Chromosome Aberrations. *Int. Rev. Cytol.*, 42:49-101, 1975.

Brinkley, B. R. and Chang, J. P. Mitosis in Tumor Cells: Methods for Light and Electron Microscopy. In *Methods in Cancer Research* (Ed. H. Busch). Acad. Press, New York. (In press).

Chang, J. P., Yokoyama, M., Brinkley, B. R. and Mayahara, H. Electron Microscopic Cytochemical Study of Phosphatases During Spermiogenesis in Chinese Hamster. *Biol. Reproduction*, 11:601-610, 1974.

Lin, T. C. and Chang, J. P. Ultrastructural Localization of Gamma Chain and IgG in Human Lymphocytes Using Enzyme-Labeled Fab Fragment. *J. Histochem. Cytochem.* (In press).

Lindsey, J. N. and Biesele, J. J. Fine Structural Changes and Cytochemistry Associated with the Centriole Adjunct in *Eublaberus posticus* (Orthoptera). *Cytobios*, 10:199-220, 1974.

Lindsey, J. N. and Biesele, J. J. Centriole Adjunct Development in the Grasshopper (*Melanoplus differentialis*). *Cytobios*, 10:59-81, 1974.

Lindsey, J. N., Dowell, R. T., Sordahl, L. A., Erickson, H. H. and Stone, H. L. Ultrastructural Effects of $+G_z$ Stress on Swine Cardiac Muscle. Aviation, Space, and Environmental Medicine. (In press).

Dowell, R. T., Sordahl, L. A., Lindsey, J. N., Stone, H. L. and Erickson, H. H. Heart Biochemical Responses in Miniature Swine Subjected to $+G_z$ Acceleration. Aviation, Space, and Environmental Medicine. (In press).

Lindsey, J. N., Brackeen, R. B. and Steinberger, A. A Rapid Method for Preparing Tissue Culture Clones for Light and Electron Microscopy. Tex. Rep. Biol. Med. (In press).

McGill, M. and Brinkley, B. R. Human Chromosomes and Centrioles as Nucleating Sites for the *In Vitro* Assembly of Microtubules from Bovine Brain. J. Cell Biol. (In press).

Houston

RICE UNIVERSITY

New members in the Biology Department are Dr. Ronald L. Sass, Professor of Chemistry and Biology and Dr. Mary Marsh, Postdoctoral Fellow in Chemistry.

BAYLOR COLLEGE OF MEDICINE

Department of Cell Biophysics

Dr. Margaret Ann Goldstein participated in a three-day basic science core teaching exercise for the American College of Cardiology led by Dr. Arnold Schwartz, F.A.C.C., May 1975, in Houston.

Publications:

Entman, M. L., Kaniike, K., Goldstein, M. A. and Schwartz, A.: Cardiac sarcoplasmic reticulum: A possible link between contractility and intermediary metabolism. *Circulation* 49/50:III-88, 1974.

Goldstein, M. A., Schroeter, J. P. and Sass, R. L.: Unit cell of Z lattice in cardiac and skeletal muscle. *J. Cell. Biol.* 63:114a, 1974.

Entman, M. L., Kaniike, K., Goldstein, M. A., Futch, T. and Schwartz, A. (SPON: J. K. Alexander): Glycogenolysis in cardiac sarcoplasmic reticulum (CSR): Studies on solubilization and reconstitution. *Fed. PProc.* 34:413, 1975.

Chang, C. H., Bornet, E. P., Entman, M. L., Goldstein, M. A., Lewis, R. M., Lie, J. T., Titus, J. L., Wood, J. M. and Schwartz, A. (SPON: D. Greenberg): Early regional effects of occlusive ischemia in canine heart: Mitochondria (Mt), sarcoplasmic reticulum (SR) and morphology. *Fed. Proc.* 34:847, 1975.

Goldstein, M. A., Schroeter, J. P. and Sass, R. L.: Optical diffraction of the Z lattice in striated muscle. Proc. 33rd Annual Meeting, Electron Microscopy Society of America. Claitor's Publishing Co., Baton Rouge, 1975.

Department of Neurology

New Members:

Randy Spalinger has recently joined Dr. Ronald Dodson's lab and is involved in the ultrastructural research program of the Baylor Methodist Center for Cerebrovascular Disease.

Lecturers:

Dr. Ronald Dodson and Mrs. Lena Wai-Fong Chu attended the recent EMSA meeting in Las Vegas. Dr. Dodson was co-chairman of the session entitled, "Vascular Pathology" and presented the following two papers:

"Middle Cerebral Artery Response Following Occlusion with a Surgical Clamp."
"Pericytic Alterations in Cerebral Infarction."

Mrs. Chu also presented a paper entitled, "Acute Response of Cerebral Tissue Following Periods of Ischemic Insult."

Recent Publications:

Tulleken, Cornelius A. F., Meyer, John Stirling, Ott, Erwin O., Abraham, Jacob, and Dodson, Ronald F.: Brain tissue pressure gradients in experimental infarction and space occupying lesions. Clinical Neurol. Neurosurg. 77:198-211, 1974.

THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON

Department of Neurobiology

Grants:

National Institute of Health has awarded a contract to the department for the Pharmacology and Toxicology of Abused Inhalants. Dr. Richard G. Peterson will serve as the Principle Investigator.

Dr. Richard G. Peterson has been awarded a 2 year grant by the National Science Foundation. The grant is entitled "Positional Relationship of PNS Myelin Proteins."

Recent Lectures:

Dr. W. O. Mc Clure presented a lecture entitled "Microtubules and Membranes and Acetylcholine Release."

Dr. Joe G. Wood has recently returned from a trip to Berlin where he was doing analytical electron microscopy studies of brain tissue.

New Staff Members and Students:

Ming Tien is a new technician working on the solvent abuse contract with Dr. Richard G. Peterson....Tere San Martine is a new technician with Dr. Dianna Redburn and is working on the autoradiography of neurotransmitters in retina....Mark Pretorius is a new graduate student in the department who is studying release and uptake of possible neurotransmitters in retina....Randy Stovall is a new student who recently completed his M.S. at U of T at Arlington and is now continuing his research in retina ultrastructure....Graduate students Kathleen Marburger and Margaret Bell are presently assisting in the Neuroanatomy course at the Medical School....Lande Kirkegaard, a former graduate student in the department, is now a medical student at the Medical School.

New Equipment:

Beckman L3-50 Ultra-Centrifuge
Isocap 300 Scintillation System

**THE UNIVERSITY OF TEXAS SYSTEM CANCER CENTER, M.D. ANDERSON
HOSPITAL AND TUMOR INSTITUTE**

Department of Virology

Grants Awarded:

Contract NO-1-CP-43370, "Immunological Studies on Human Breast Carcinoma" awarded to Dr. Bowen, has been renewed to March 26, 1976. Core Grant CA - 16672 has been awarded to Dr. Bowen for two years beginning June 30, 1975. Grant 1RO1 CA-16789, "Immunology of Animal and Human Breast Carcinoma" has been awarded to Dr. Bowen for three years to May 31, 1978. Grant 5R26 CA-15438, "Study of Oncogenic Viruses in Human Prostate Cancer", has been awarded to Dr. Dmochowski for the third year to May 31, 1976.

Lectures:

Dr. Marcel A. Baluda, Professor of Viral Oncology and Associate Director of Research, Department of Medical Microbiology and Immunology, UCLA Cancer Center, visited the Institution on March 4-7 and presented a seminar entitled, "Interaction Between Cellular DNA and the Genome of RNA Tumor Viruses."

Dr. James W. Davis of Flow Laboratories visited the Department on May 29 and 30, presenting a seminar entitled "Multiple Antigenic Determinants of the Major Group-Specific Antigen of Mammalian Leukemia Viruses."

Moshe Glaser, Ph.D., Laboratory of Immunodiagnosis, NCI, visited the Department on June 24-25, 1975, and presented a seminar entitled "*In Vitro* and *In Vivo* Studies of Cell-Mediated Immunity Against Syngeneic Gross Virus-Induced Leukemia in Rats."

Professor A. O. Williams, M.A., M.D. (Dub.), F.R.C.P.I., M.R.C.P. (Lond.), M.R.C. Pathology, F.C.C., Pathology, Chairman of the Department of Pathology, University of Ibadam, Ibadam, Nigeria, visited the Department on May 29, 1975. Professor Williams presented a seminar on "Hepatitis B Antigen and Liver Cancer."

Publications:

"Type C Virus Particles in Placenta of Cottontop Marmoset (*Saguinus oedipus*)," by G. Seman, B. M. Levy, M. Panigel, and L. Dmochowski, was published in *J. National Cancer Institute*, 54:251-252, January 1975.

"Closing Remarks" on the 9th. Meeting on Mammary Cancer in Experimental Animals and Man, by L. Dmochowski, was published in *J. Lav. Anta. Pat.*, Perugia 34:96-106, 1974.

"Virus Retrieval Studies in Human Neoplasia" by L. Dmochowski, J. Georgiades, J. L. East, P. T. Allen, and J. M. Bowen has been published in *Proceedings of the VIth International Symposium on Comparative Leukemia Research 1973. Leukemogenesis*. Y. Ito and R. M. Dutcher, eds., University of Tokyo Press, 1975.

"Comparative Morphology, Immunology, and Biochemistry of Viruses Associated with Neoplasia of Animals and Man," by J. M. Bowen, J. L. East, P. T. Allen, K. Maruyama, E. S. Priori, J. Georgiades, J. C. Chan, M. F. Miller, G. Seman, and L. Dmochowski, Chapter 14, *Viruses, Evolution and Cancer* (Kurstak and Maramorosh, editors), Academic Press, Inc., New York City, pp. 403-426, 1975.

New Faculty and/or Staff Members:

Dr. James W. Davis has joined the staff of the Institute as Assistant Virologist and is working on immuno-chemico studies of breast cancer in animals and humans.

Mr. Richard Binns, a premed student at Bridgewater College, Bridgewater, Virginia, is working in our Electron Microscopy Laboratory this summer.

Lubbock

TEXAS TECH UNIVERSITY

Department of Biological Sciences

Tom Pizzolato has accepted another postdoctoral position and will leave Texas Tech. He will be engaged in anatomical studies of the cottonwood (*Populus deltoides*) at the North Central Forest Experiment Station, U. S. Forest Service, in Rhinelander, Wisconsin.

William J. Bleier has accepted an Assistant Professor position in the Department of Zoology at North Dakota State University in Fargo, North Dakota. He will be teaching Histology, Embryology, and Comparative Anatomy.

Gregory Smutzer received his Master of Science degree in July.

Linda Chamberlin received her Master of Science degree in July.

Fannie E. Smith is spending 8 weeks this summer working with Dr. I. B. Fritz at Banting and Best Institute in Toronto, Ontario, Canada. She is doing research on Sertoli cell cultures.

Publications:

Pizzolato, T. D. and C. Heimsch. 1975. A striking example of intrusive growth in protophloem fibers of *Pelargonium* Bull. Torrey Bot. Club 102: in press.

_____. 1975. Ontogeny of the protophloem fibers and secondary xylem fibers within the stem of *Coleus*. I A light microscope study. Can. J. Bot. 53: in press.

_____. 1975. Ontogeny of the protophloem fibers and secondary xylem fibers within the stem of *Coleus*. II. An electron microscope study. Can. J. Bot. 53: in press.

Burbano, J. L., T. D. Pizzolato, P. R. Morey and J. D. Berlin. 1976. An application of the Prussian blue technique to a light microscope study of water movement in transpiring leaves of cotton. (*Gossypium hirsutum*). L. J. Exp. Bot.

Pizzolato, T. D., J. L. Burbano, J. D. Berlin, P. R. Morey and R. W. Pease. 1976. An electron microscope study of the path of water movement in transpiring leaves of cotton (*Gossypium hirsutum*). L. J. Exp. Bot. under review.

Pizzolato, T. D., G. Smutzer and J. D. Berlin. 1976. An *in vivo* demonstration of pollen tube growth for elementary botany laboratories. Amer. Biol. Teacher. under review.

Bleier, J. J. 1975. Early Embryology and Implantation in the California Leaf-nosed Bat, *Macrotus californicus*. The Anatomical Review. 182:237-253.

Bailey, F. 1975. Thin Polymer films as non-charging surfaces for scanning electron microscopy. Journal of Microscopy. Vol. 104.

TEXAS TECH UNIVERSITY SCHOOL OF MEDICINE

Department of Anatomy

Roger Markwald has accepted a position as Associate Professor of Anatomy. He comes to us from the Medical University of South Carolina in Charleston.

Dr. Markwald was recently awarded a grant from the National Institute of Health, Heart and Lung Institute for \$130,000 over the next three years. It was awarded to study mucopolysaccharide metabolism and cardiac anomalies.

Kenneth Karkos is to join the faculty in September as Assistant Professor of Anatomy. He is currently completing a postdoctoral fellowship at Johns Hopkins University in Baltimore, Md. His arrival will bring the number of faculty to ten.

The Anatomy Department has recently added some new equipment to its E.M. armamentarium, these are: a goniometer stage for the new Zeiss 10 electron microscope purchased a year ago; another Porter-Blum Mt-2B ultramicrotome to help alleviate some of the strain that accompanied the new additions to faculty.

Publications:

Hillman, J. R., W. G. Seliger and P. E. Burk. 1975. Cytochemical studies of protein uptake by adrenal cortical cells of the golden hamster. In *The Ultrastructure of Endocrine and Reproductive Organs*. M. Hess (ed). Willey-Interscience, New York. Chap. 26, pp. 419-33.

Hillman, J. R., W. G. Seliger and G. P. Epling. 1975. Electron microscopy and histochemistry of the developing adrenal cortex of the hamster. *Gen. Comp. Endocrinol.* 25:14-24.

Wilbur, D. L., W. C. Worthington and R. R. Markwald. 1975. Morphological changes in the rat anterior pituitary somatotrophs following pituitary portal vessel infusion of several growth hormone releasing factors: an electron microscopic study and radioimmunoassay study. Accepted for publication in *Neuroendocrinology*.

San Antonio

THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT SAN ANTONIO

Department of Anatomy

Grants Awarded:

Dr. Edward G. Rennels - Principal Invest.

Dr. Damon C. Herbert - Co-Invest.

Immunocytochemical Studies on Pituitary Gonadotrophins

Lectures:

Drs. E. Phyllis Bowie, Damon C. Herbert, Edward G. Rennels, Masataka Shiino and Nobuyoshi Hagino presented papers at the 10th International Congress of Anatomists Tokyo, Japan, August 25-30, 1975.

Publications:

Jeter, J. R., Paulat, W. A. and Cameron, I. L. 1975. Changes in the Nuclear Acidic Proteins and Chromatin Structure in Starved and Refed *Tetrahymena*. *Exp. Cell Res.* 93:79-89.

Paulat, W. A., Rogers, W. and Cameron, I. L. 1975. Morphometric Analysis of Pancreatic Acinar Cells from Orally Fed and Intravenously Fed Rats. *J. Surg. Res.* In Press.

Warchol, J. B., Shiino, M. and Rennels, E. G. 1974. Stereotopography of the Prolatin Cells of the Pituitary Gland. *Experientia* 30:1444-1446.

Warchol, J. B., Herbert, D. C., Rennels, E. G. 1974. Localization of Microfilaments in Prolactin Cells of the Rat Anterior Pituitary Gland. *Cell Tissue Res.* 155:193-199.

Warchol, J. B., Herbert, D. C., Williams, M. G. and Rennels, E. G. 1975. Distribution of Microtubules in Prolactin Cells of Lactating Rats. *Cell Tissue Res.* 159:205-212.

Shiino, M. and Rennels, E. G. 1975 Microtubules in Thyroidectomy Cells of the Rat Anterior Pituitary Gland. *Proc. Soc. Exp. Biol. Med.* 149:380-383.

New Faculty:

Dr. John Hansen
Dr. Peter Sheridan
Dr. Mary Vaughan
Dr. Frank Weaker

SOUTHWESTERN RESEARCH INSTITUTE

Lectures and Seminars:

David L. Davidson - Seminar at University of Houston, March 5, 1975.

J. Lankford - Presented papers at The Micromechanical Modeling of Fracture Conference in Troy, New York, June 23, 1975.

Publications:

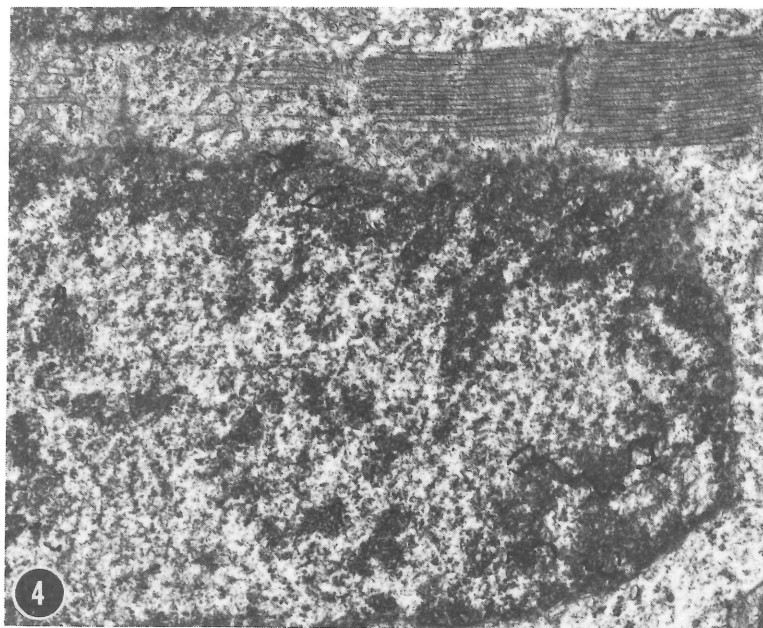
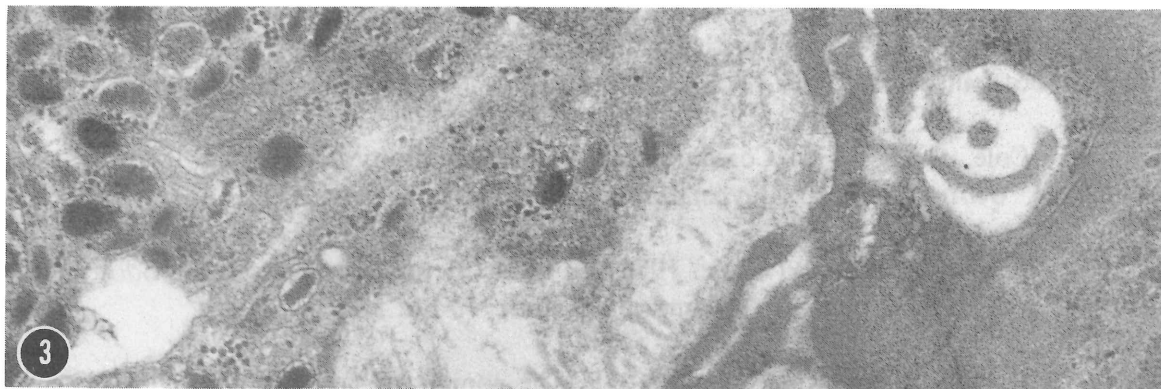
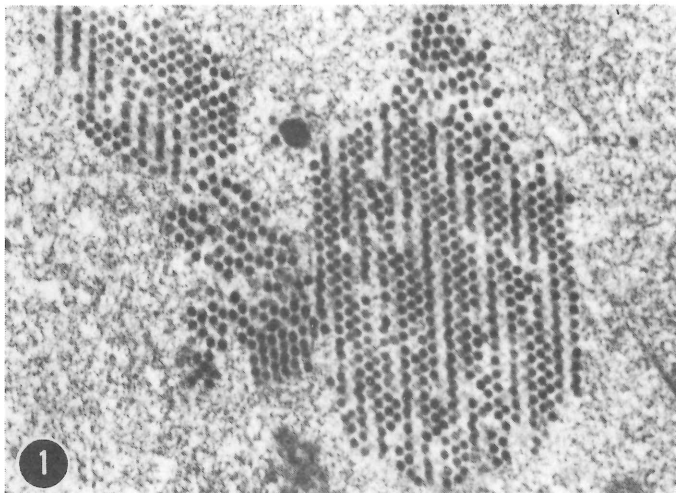
"Plastic Zone Size Associated with a Stress Corrosion Crack as Determined by Selected Area Electron Channeling," by D. L. Davidson and F. F. Lyle, Jr., *Corrosion*, 31, 135 (1975).

"Fatigue Crack Tip Plasticity Associated with Overloads and Subsequent Cycling," by J. Lankford and D. L. Davidson, *Journal of Engineering Materials and Technology* (ASME), in press (1975).

"Plastic Strain Distribution at the Tips of Propagating Fatigue Cracks," by D. L. Davidson and J. Lankford, *Journal of Engineering Materials and Technology* (ASME), in press (1975).

"The Use of Electron Channeling in Materials Research and Failure Analysis," by D. L. Davidson, IV Inter-American Conference on Materials Technology, Caracas, Venezuela, p. 39-43, June 1975.

"Rotation Between SEM Micrograph and Electron Channeling Patterns," by D. L. Davidson, *Journal of Physics E*, in review (1975).



AREA NEWS

Austin

THE UNIVERSITY OF TEXAS AT AUSTIN

Cell Research Institute

Whaley, W. Gordon. 1975. The Golgi Apparatus. Cell Biology Monographs, Vol. 2. Springer-Verlag, Vienna, in press.

Whaley, W. G., Marianne Dauwalder and T. P. Leffingwell. 1975. Differentiation of the Golgi apparatus in the genetic control of development. Current Topics in Developmental Biology, Vol. 10. Academic Press, New York, in press.

Department of Botany

Cole, G. T. 1975. A viral infection of the hyphomycetous fungus, *Briosia cubispora*. Proc. Microsc. Soc. Can., Vol. 2, in press.

Cole, G. T. 1975. A preparatory technique for examination of imperfect fungi with the SEM. Cytobios 12, in press.

Cole, G. T. 1975. The thallic mode of conidiogenesis in the Fungi Imperfecti. Can. J. Bot., in press.

Cole, G. T. 1975. Conidiogenesis in pathogenic hyphomycetes. I. *Sporothrix*, *Exophiala*, *Geotrichum* and *Microsporium*, Sabouraudia, in press.

Koehn, R. and G. T. Cole. 1975. An ultrastructural comparison of *Podosordaria leporina* and *Poronia oedipus* (Ascomycetes). Can. J. Bot., in press.

Koehn, R. and G. T. Cole. 1975. The conidia of *Podosordaria leporina*. Am. J. Bot., in press.

Papers Presented at Meetings:

Cole, G. T. 'Conidiogenesis in *Cladobotryum variospermum*: retrogressive holoblastic conidium formation,' Symposium on Principles of Classification of the Fungi, XIIth International Botanical Congress, Leningrad, Russia, July 3-10, 1975.

Cole, G. T. 'Applications of ultrastructure to plant systematics,' XIIth International Botanical Congress, Leningrad, Russia, July 3-10, 1975.

Cole, G. T. Visiting Scientist (recipient of Alexander von Humboldt Fellowship) at the Institut für Meeresforschung, June 1 - August 31, 1975.

COMMUNICATIONS

TEN BIG ONES

The May 1975 meeting of the Texas Society for Electron Microscopy at the Hyatt Regency in Houston marked the tenth anniversary of the Society. There were 26 charter members at the time of initial meeting of TSEM held at Rice University on May 4, 1965 compared to 208 members at the time of the May 1975 meeting. A highlight of the recent meeting was the reunion of the ten past presidents of TSEM. Pictured on the opposite page, left to right they are: Bill Brinkley, Terry Hoage, Joe Wood, Bob Turner, Bob Yates, Dimitrij Lang, Don Benefiel, Dan Roberts, Lea Rudee, and Bill Philpot.

The Texas Society for Electron Microscopy has a bright and promising future, as we have a growing number of graduate students and technical persons now actively involved in TSEM activities.

A BIG THANK-YOU

A big thank you goes out to Barbara Haberman and all those fast and accurate fingers at the Word Processing Center who did all the typing, and to Ed Hurst and his staff at the Printing Shop for all their help in getting the Newsletter to Press. Thank you all.

AN ANONYMOUS COMMENT

The latest NIH Guide, Vol. 4, No. 7, 1975 announces the formation of a NIH internal study team "to conduct a detailed and comprehensive study of the procedures generally known as "peer review" and make a report of its findings and recommendations to the Director of NIH".

No pink sheets necessary for this one, eh, boys? Sort of reminds one of the tobacco industry's internal attention to their own research after the first detrimental report on smoking by the Surgeon General's office! Why don't they ever ask the small time researchers, who don't ride on the backs of the bigger fleas, for their experiences with "peer review"?

If congress (or the NIH internal study team - Ha!) wants to know the real workings of "peer review" through the study sections, they should look at the products of the system - the rejection critique. What's the old saying, "ask the man who owns one"?

Anonymous

GRADUATE STUDENTS.....ARISE !!!

There was a meeting of a subcommittee on graduate student awards held at the Electron Microscopy Center at Texas A&M University on August 22. Topics at the meeting concerned graduate student competition papers and the role of the graduate student in the Society. Several changes were suggested by the subcommittee contingent upon Executive Committee approval. Please contact Fannie Smith, Graduate Student Representative to the Executive Committee, and give her your feelings concerning these matters. She can be contacted at Texas Tech University in the Department of Biological Sciences.

EMSA PRESIDENTIAL SCHOLARSHIPS

Presidential Scholarships designed to promote student interest and participation in the scientific sessions are available.

Regulations for EMSA Presidential Scholarships:

1. In order to be eligible a candidate must be a bona fide student of a recognized College or University at the time of the annual meeting.
2. Application is made by sending an abstract in the form usually submitted for inclusion in the Proceedings to the President of the EMSA no later than March 1, 1976. EMSA President for 1976 - Professor E. de Harven, Department of Cytology, Sloan-Kettering Institute, 410 E. 68th Street, New York, New York 10051.
3. Each application must also be sponsored, as indicated with a signed statement by a member of the EMSA.
4. The abstract is to be authored *only* by the student, so as to be representative of his own work. Acknowledgements to faculty sponsors and funding agencies should be made at the end of the abstract.
5. The President with the help of a selection committee will then select up to twenty worthy applications, at most ten from the biological field, and at most ten from the physical field.
6. Students submitting the selected abstracts will be notified and will be expected to attend the meeting and present their work at a regular scientific session. The award will be given only if the student is there to present his paper in person.
7. Scholarship winners will receive complimentary registration at the annual meeting, including a copy of the Proceedings, and a banquet ticket. Winners will also be reimbursed for their economy round trip travel expenses (airfare or equivalent).

PLACEMENT SERVICE

Positions Available:

1. Professional level person Ph.D. with experience in cellular kinetics and *in vitro* tumor cell studies.
2. Professional level person Ph.D. with experience in electron microscopy and/or histochemistry and cytochemistry.
3. Possibility of 2 positions for persons with experience in electron microscopy and tissue culture work.

For information concerning the above positions, please contact Dr. Bill Brinkley, Dr. Jeffery Chang, or Dr. Sam Barranco at the Department of Human Biological Chemistry and Genetics at The University of Texas Medical Branch, Galveston, Texas 77550: (713) 765-2761.

NEW TITLES OF INTEREST

Goldstein, Joseph I. and Markowitz, Harvey. Practical Scanning Electron Microscopy. Illustrated. 1975. 49.50 (ISBN 0-306-308020-7, Plenum Pr.) Plenum Pub.

Hayat, M.A. Principles and Techniques of Electron Microscopy: Biological Applications, Volume 5. 1975. Text ed. price not set (ISBN 0-442-25681-7). Van Nos Reinhold.

Kessel, R.G. and Shih, C.Y. Scanning Electron Microscopy in Biology: A Student's Atlas of Biological Organization. Illustrated. 1974. 19.90 (ISBN 3-540-06724-8) Springer-Verlag.

Ohnsorge, J. and Holm, R. Scanning Electron Microscopy. Illustrated. 1974. Lib. bdg. 28.50 (ISBN 0-88416-053-X) Publishing Sci.

Siegel, Benjamin and Beaman, D.R. eds. Physical Aspects of Electron Microscopy and Microbeam Analysis. LC 74-22483. (Cell Biology Ser.) 1975. 32.50 (ISBN 0-471-79020-6) Wiley.

TEXAS SOCIETY FOR ELECTRON MICROSCOPY

FALL SYMPOSIA - TOPICS AND SPEAKERS

Introduction to X-ray Energy and Microbeam Analysis

Dave Wherry - Tracor Northern

Forensic Use of the Scanning Electron Microscope

Bill Steward - Siemens Corporation

Introduction to Morphometric Analysis

Ivan Cameron - Department of Anatomy, The University of Texas
Health Science Center at San Antonio

SATURDAY MORNING

OCTOBER 11, 1975

MAYAN DUDE RANCH

BANDERA, TEXAS

ABSTRACTS FOR POSTERS PRESENTED
AT THE
FALL 1975 MEETING OF THE
TEXAS SOCIETY FOR ELECTRON MICROSCOPY

MAYAN DUDE RANCH
BANDERA, TEXAS

OCTOBER 10, 11, 12, 1975

ABSTRACTS

ULTRASTRUCTURAL DIFFERENCES BETWEEN EU- AND HETEROCHROMATIN. T. B. Pool, T. R. Hoage, F. J. Weaker, E. K. Adrian, and I. L. Cameron, Department of Anatomy, The University of Texas Health Science Center at San Antonio, San Antonio, Texas, and Department of Biology, Sam Houston State University, Huntsville, Texas.

Ultrastructural observations and measurements were made on micrographs of thin sections of eu- and heterochromatin enlarged 6×10^5 times. The following cell types were studied: chicken erythrocytes and monocytes, salamander epithelial cells, grasshopper and armadillo spermatids, and mouse neurons. Both eu- and heterochromatin consist of fibers with two different configurations, a large fiber averaging 29.3 ± 3.77 nM in diameter which is made up of an omnipresent subunit fiber ranging in size from 2.0 to 3.5 nM. In all cases the large fiber of euchromatin was significantly larger in diameter ($p < .001$) than the large fiber of heterochromatin. On the other hand, there was never a significant difference between the subunit fiber diameter of eu- and heterochromatin. Counts of the number of subunit fibers in cross sections of the large chromatin fibers of eu- and heterochromatin revealed no significant differences. It is concluded that structural differences can be seen between eu- and heterochromatin and that both have a basic subunit fiber of similar diameter. Therefore the reason that the larger euchromatic fiber has a greater diameter is not due to an increase in number of subunit fibers, but is due to a diffuse packing of the subunit fiber. Such differences in chromatin structure have, to our knowledge, never before been reported. (Supported by USPHS Grant CA16831).

ACCOUNTING FOR SOME PHYSICAL CHARACTERISTICS OF SKIN - C. Ward Kischer, Department of Anatomy, The University of Texas Medical Branch, Galveston, Texas

The physical characteristics of dermal connective tissue, gel-sol state, elasticity, tensile strength, etc., have been described, in part, by a load model called a Kelvin element (Viidik, A. and R. Ekholm, *Light and Electron Microscopic Studies of Collagen Fibers Under Strain*, *Zeitsch. f. Anat. u. Entwickl.*, 127:154-164, 1968). Much of the mechanism of this model is purportedly explained by collagen and its precursors, whereas, little or no mention is given to the effect that glycosaminoglycans (GAGs) association with collagen may have.

Comparative ultrastructural studies of normal skin and scar tissue, demonstrate the physical consistency of the connective tissue to be quite different one case from the other. Localization of GAGs by ruthenium red show a similar difference in form and magnitude.

In addition to contributions of GAGs to the physical characteristics of dermal connective tissue, the amount of interstitial space, great in normal skin and small in scar tissue, is also a factor. Still another important feature limiting the physical load to which skin can respond is the amount of intercoiling among the collagen filaments and fascicles, small in normal dermis but great in hypertrophic scars.

Although other factors undoubtedly exist which account for the physical nature of skin and its response to load, the above features may be monitored rather easily by routine TEM and SEM procedures.

TUMOR CELLS GROWN *IN VITRO*, William B. McCombs III, Albert Leibovitz, Cameron E. McCoy, James C. Stinson, and Donald A. Jutzy. Scott and White Clinic.

During the last four years we have established over 60 human cell lines from tumors taken from various sites in the body. These cell lines have been studied by electron

microscopy. Although no unique morphological feature common to tumor cells that differentiate them from normal cells could be found, many unusual specialized structures have been observed in these cell lines. In addition to electron microscopy studies, these cell lines are also being investigated for the *in vitro* production of tumor associated antigens. To date, carcinoembryonic antigen has been found in all our colon tumor cell lines, and tumor polypeptide antigen in over 50% of all cell lines studied. These tumor cell lines are also routinely used in our clinical virology and immunology sections.

A BOTANICAL ENIGMA. Dale M. J. Mueller and Randy Scott, Department of Biology, Electron Microscopy Center, Texas A&M University, College Station, Texas 77843.

Buxbaumia is atypical moss for a number of reasons. It has always been viewed with great astonishment when the amateur bryologist first finds it. *Buxbaumia* is purportedly saprophytic and is usually found on highly organic soil or on rotting logs. The moss has the smallest gametophyte phase and one of the most elaborate sporophyte phases. Gametophytes consist of a mass or protonema and several highly reduced leaves and one or two archegonia and one leaf enveloping a single antheridium. The sporophyte is disproportionately large and has a unique spore dispersal mechanism, i.e., rain drops hit a flattened part of the capsule resulting in expulsion of a cloud of spores. A study of the gametophyte phase was conducted on germinating spores over a period of several years. Gametophores (male and female) are initiated under long day conditions in old cultures. It is possible to see the transverse walls in the filaments of protonemata by using a minimal coating of metal and high voltage SEM (32 KV). The protonemata represents the long lived and dominant aspect of the gametophyte generation.

SCANNING ELECTRON MICROSCOPY OF CONNECTIVE TISSUE IN COOKED AND RAW MUSCLE. Mary Lou Percy, T. R. Dutson, and E. L. Thurston. Department of Animal Science, Texas Agricultural Experiment Station; Electron Microscopy Center, Texas A&M University.

Our objective is to characterize the changes that take place in the morphology of biceps femoris perimysial connective tissue due to cooking. Specimens were taken from a bullock carcass at seventy-two hours post-mortem. Half of the biceps femoris muscle was cooked until an internal temperature of 75°C was reached and the other half was left in a raw state. The cooked and raw specimens were prepared for viewing in the scanning electron microscope. The raw biceps femoris muscle has thick sheets of perimysial connective tissue spreading over muscle fibers between muscle bundles. The sheets of perimysial connective tissue appears to be made up of numerous strands of fibers which averaged 3.8µm in diameter and attach to the muscle bundles at various points. The perimysial connective tissue of the cooked muscle was coagulated in thick sheets over the muscle fibers and between the muscle bundles. Cross-grained sheets of connective tissue could be seen alternating with bundles of muscle. Endomysial connective tissue appears closely attached to the muscle fibers in the raw state. However, the endomysial sheet in the cooked samples is more clearly delineated, as if coagulation during cooking separated the endomysium from the muscle fibers.

THE ULTRASTRUCTURE OF CELL DIVISION IN NEONATAL RAT HEART, Margaret Ann Goldstein, Department of Cell Biophysics, Baylor College of Medicine, Houston, Texas 77025

The twelve micrographs reveal selected aspects of the morphology of cell division in ventricular cells of the two-day neonatal rat heart. The interphase nucleus of the cardiac cell is shown first. Next, an EM autoradiograph of a myocardial nucleus reveals localization of tritiated thymidine and indicates DNA synthesis in a cell which contains aligned myofibrils. In prophase the chromatin has clumped into chromosomes and the nuclear envelope is breaking down. During metaphase the chromosomes line up at the metaphase plate in the center of the cell. Characteristic spindle microtubules and kinetochores are visible. The myocardial cell remains elongated during division and retains its attachment via desmosomes to adjacent non-dividing cardiac cells. From the metaphase stage to the formation of large daughter cells, myofilament bundles are not organized into myofibrils but become randomly oriented, particularly near the center of the cell and the moving chromosomes. In cytokinesis, remnants of spindle microtubules are seen in the mid body and the beginnings of the intercalated disc can be seen at the cell boundaries of the recently formed daughter cells. Bundles of thick and thin filaments sometimes appear to interrupt the formation of the cleavage furrow and incomplete cytokinesis occurs.

TISSUE DEHYDRATION PROCEDURES INVOLVED IN LOSS OF BIOGENIC AMINE-DICHROMATE REACTION PRODUCTS. Kathleen Marburger, Jane Crick, and Joe G. Wood of The Program in Neurostructure and Function at The University of Texas Health Science Center at Houston.

Unsubstituted biogenic amines (BA's) will react with aldehydes to form Schiff base products and subsequent isoquinoline derivatives which will further react with hexavalent metals such as chromium (Cr) or molybdenum (Mo). Fixation of tissue using the above procedure results in an electron dense metal deposit at the site of the BA localization (concentration). To accurately determine the content and distribution of BA's within the cytoplasm as well as more specifically within the cytoplasmic granules, it is of primary importance that loss of reaction product from the site of localization be minimized. In preparing Ba-containing tissue for electron microscopy, preliminary studies indicate that the amount of reaction product lost depends upon the dehydration procedure used. A dehydration method using a continuous increase in ethanol concentration and short exposure to propylene oxide (as compared to traditional graded method) and one involving the use of 2,2-dimethyloxypropane (DMP) have been shown to be most effective in minimizing loss of reaction products. The BA's studied were norepinephrine (NE) of the rat adrenal medulla and 5-hydroxytryptamine (5-HT) of the enterochromaffin cells of the intestine. The hexavalent metal deposits of these BA's were studied using both transmission and analytical electron microscopy. Supported by HEW Grant NS 10326.

*
* POSTDOCTORAL FELLOWSHIP *
*

Immediately Available - October 1975

Area of Study: Transmission electron microscopy
of human skin and scar tissue in
study of hypertrophic scarring.

Duration: One year, may be renewable

Qualifications: Ph.D. required. Must be skilled
at TEM and thin sectioning. Background
of cell biology (animal tissues) and
embryology useful

Salary: Minimum \$10,000

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DIRTY TRICKS IN THE ELECTRON MICROSCOPY LABORATORY. Alan B. Weckerling
Electron Microscopy Laboratory, Laboratory Activities, Brooke Army Medical
Center, Ft. Sam Houston, Texas 78234.

The electron microscopy laboratory is haunted by time consuming and sometimes dangerous procedures. The requirement to simplify and shorten processing time is obvious; however, the means by which we can accomplish this is sometimes hard to find. Therefore, the "Dirty Tricks" bag must be brought out of the storeroom. The following procedures will be described: (A) A simplified, non-razor blade, method for removing the specimen block from a BEEM capsule. (B) A cheap and easy way to provide dark field illumination for lining up the microtome knife. (C) A method for sealing a metal "boat" to a glass knife. (D) A sneaky way to prevent your stain drops from flowing together. (E) How to store your blocks so that you can easily see what work you have done on the case.

THE SHAPE CLASSIFICATION OF THE RED BLOOD CELL, M. E. Brower, J. R. Dardano, G. A. Waits, and T. D. Rogers. Northrop Services, Inc., Space Sciences Laboratory (NASA/JSC), P. O. Box 34416, Houston, TX 77034.

The typical biconcave shape of the red blood cell is one of the principal characteristics indicating the normal integrity of both the cells' biochemical structure and the chemical composition of the plasma. By altering either or both the physical and biochemical characteristics of the cell or its surrounding medium, a variety of morphological aberrations may be expressed by the red cell membrane. A classification scheme based on red cell shape distribution in peripheral blood contains a number of distinctly recognizable forms other than the biconcave disc. These forms may be a normal deviation resulting from changes in the balance between physical forces, energy requirements, and biochemical composition of the red cell in its environment. Disturbance of these forces may cause an alteration in the red cell shape which may be permanent, or only transient in nature. These alterations from the discoid shape provide a basis for a classification scheme within the normal population.

Deviation in the distribution of cell shape is known to occur in various pathological conditions, by manipulation of in vitro or in vivo environmental factors, or when abnormal physical stresses are applied. SEM examples of both the normal classification scheme and abnormal shape alterations of red cells are presented.

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LEGENDS FOR CONTRIBUTED MICROGRAPHS

1. Human wart virus (Papilloma) crystals. 2.5% glutaraldehyde in 0.2M sodium cacodylate; 1% osmium tetroxide. Post stained with uranyl acetate and lead citrate. X 37,500
Mary R. Haynes and Joanne Tontz Ellzey, Ultrastructure Laboratory, The University of Texas at El Paso.
2. Long synaptic ribbons from the visual cells of the outer plexiform layer of a racer (*Coluber constrictor*). 2.5% glutaraldehyde in phosphate buffer; 2% osmium tetroxide. Post stained with uranyl acetate and lead citrate. X 3,600
Randall Stovall, Department of Neurostructure and Function, The University of Texas Health Science Center at Houston.
3. Adrenal medulla (ever smiling). 4% glutaraldehyde in 0.2M sodium cacodylate with 1% sodium molybdate pH 7.2. 4% glutaraldehyde in 0.2M sodium cacodylate with 2.5% potassium dichromate and 2% sodium sulfate pH 4.1. 4% paraformaldehyde in 0.2M sodium cacodylate pH 7.2. 1% osmium tetroxide. On grid staining with lead citrate.
Jane Crick and Joe G. Wood, Department of Neurostructure and Function, The University of Texas Health Science Center at Houston.
4. An E.M. autoradiograph of DNA synthesis in a 2 day old neonatal rat ventricular cell. Note silver grains over clumped chromatin in the nucleus and the prominent polyribosomes in the cytoplasm. X 17,000.
Margaret Ann Goldstein and David L. Murphy, Department of Cell Biophysics, Baylor College of Medicine, Houston, Texas.

COVER MICROGRAPH: Electron micrograph of rat lung surfactant showing floccular or homogeneous hypophase (basal coat) and the lattice (superficial coat) which contains most of the surface-active substances. X 155,000.

G. Callas, Department of Anatomy, The University of Texas Medical Branch, Galveston, Texas.