

TABLE OF CONTENTS

PREFACE.	vii
PART I - <u>Fifth Annual Scanning Electron Microscope Symposium</u>	
SCANNING ELECTRON MICROSCOPY: THE NEXT TEN YEARS K. C.A. Smith.	1
SCANNING ELECTRON MICROSCOPY AT LIQUID HELIUM TEMPERATURES B. W. Griffiths and J. A. Venables	9
SCANNING ELECTRON MICROSCOPY TO 1600°C R. M. Fulrath.	17
FIVE EASY PIECES - AIDS IN SCANNING ELECTRON MICROSCOPY J. F. Norton.	25
THE CYLINDRICAL SECONDARY ELECTRON DETECTOR AS A VOLTAGE MEASURING DEVICE IN THE SCANNING ELECTRON MICROSCOPE H. Yakowitz, J. P. Ballantyne, E. Munro and W. C. Nixon.	33
A STORAGE-DISPLAY SYSTEM FOR THE SCANNING ELECTRON MICROSCOPE C. J. D. Catto and K. C. A. Smith.	41
SIMULTANEOUS DISPLAY SYSTEM OF DIFFERENT MAGNIFICATION IMAGES IN SCANNING ELECTRON MICROSCOPY T. Nagatani, M. Okumura and H. Ito	49
INVARIANCE UNDER TRANSFORMATION: A USEFUL CONCEPT IN THE INTERPRETATION OF SEM IMAGES T. L. Hayes.	57
HIGH SPATIAL RESOLUTION X-RAY MICROANALYSIS OF THIN SPECIMENS IN THE SCANNING ELECTRON MICROSCOPE L. V. Sutfin	65
RESOLUTION AND SENSITIVITY OF X-RAY MICROANALYSIS IN BIOLOGICAL SECTIONS BY SCANNING AND CONVENTIONAL TRANSMISSION ELECTRON MICROSCOPY J. C. Russ	73
SCANNING X-RAY EMISSION MICROSCOPY H. J. Leamy and S. D. Ferris	81
ANOMALOUS CRYSTALLOGRAPHIC CONTRAST ON ROLLED AND ANNEALED SPECIMENS D. C. Joy, D. E. Newbury and P. M. Hazzledine.	89
ABSORBED CURRENT IMAGERY FOR SURFACE STUDIES IN THE SEM L. N. Johnson and W. Kamrath.	97
ELECTRON BEAM INDUCED CURRENT IN SILICON PLANAR p-n JUNCTIONS: PHYSICAL MODEL OF CARRIER GENERATION. DETERMINATION OF SOME PHYSICAL PARAMETERS IN SILICON J. F. Bresse	105
BASIC LIMITATIONS OF PROBE FORMING SYSTEMS DUE TO ELECTRON - ELECTRON INTERACTION H. C. Pfeiffer	113
COMPARISON AND EVALUATION OF SPECIMENS FOR RESOLUTION STANDARD D. B. Ballard.	121
EXPERIMENTAL RESOLUTION LIMIT IN THE SECONDARY ELECTRON MODE FOR A FIELD EMISSION SOURCE SCANNING ELECTRON MICROSCOPE T. Komoda and S. Saito	129

THE RATIONALE AND MODE OF APPLICATION OF THIN FILMS TO NON-CONDUCTING MATERIALS P. Echlin and P. J. W. Hyde	137
OBSERVATIONS ON THE PREVENTION OF SPECIMEN CHARGING G. E. Pfefferkorn , H. Gruter and M. Pfautsch	147
CHARGING ARTIFACTS IN THE SCANNING ELECTRON MICROSCOPE J. B. Pawley	153
OBSERVATIONS OF UNCOATED, NONCONDUCTING OR THERMALLY SENSITIVE SPECIMENS USING A FAST SCANNING FIELD EMISSION SOURCE SEM L. M. Welter and A. N. McKee	161
EXPLANATION OF THE LOW-LOSS IMAGE IN THE SEM IN TERMS OF ELECTRON SCATTERING THEORY O. C. Wells	169
A TECHNIQUE FOR THE EXAMINATION OF IRRADIATED MATERIALS IN A SCANNING MICROSCOPE R. Natesh and J. P. Bacca	177
A METHOD OF SEQUENTIAL ETCHING OF PASSIVATION FOR THE SEM INSPECTION OF SUBSURFACE METALLIC LAYERS R. E. Flutie	185
SCANNING ELECTRON MICROSCOPY TECHNIQUES FOR AMORPHOUS SEMICONDUCTOR DEVICE STUDIES C. H. Sie	193
PHYSICAL LIMITS IN TRANSMISSION SCANNING ELECTRON MICROSCOPY OF THICK SPECIMENS L. Reimer	197
THEORY AND PRACTICE OF REVEALING CRYSTALLOGRAPHIC DEFECTS WITH THE SEM BY MEANS OF DIFFRACTION CONTRAST C. J. Humphreys , J. P. Spencer , R. J. Woolf , D. C. Joy , J. M. Titchmarsh and G. R. Booker	205
THE ARIZONA 1MeV TRANSMISSION SCANNING ELECTRON MICROSCOPE-- SOME DESIGN FEATURES A. Strojnik	215
METHODS FOR TRACING RAY PATHS THROUGH ELECTRON OPTICAL LENSES TO INVESTIGATE SPHERICAL ABERRATION IN THE SEM G. R. Booker and R. Stickler	225
COMPARISON OF VARIOUS METHODS FOR REDUCING MEASUREMENTS FROM STEREO-PAIR SCANNING ELECTRON MICROGRAPHS TO "REAL 3-D DATA" P. G. T. Howell and A. Boyde	233
COMPARISON OF HEIGHT AND DEPTH MEASUREMENTS WITH THE SEM AND TEM USING A SHADOW CASTING TECHNIQUE E. K. Brandis	241
HANDLING, MOUNTING, AND EXAMINATION OF PARTICLES FOR SCANNING ELECTRON MICROSCOPY O. Johari and P. B. DeNee	249

Table of Contents continued on next page

PART II - Workshop on Biological Specimen Preparation
for Scanning Electron Microscopy

BIOLOGICAL SPECIMEN PREPARATION FOR THE SCANNING ELECTRON MICROSCOPE - AN OVERVIEW A. Boyd	257
COMPARISON OF FIXATION AND DRYING PROCEDURES FOR PREPARATION OF SOME CULTURED CELL LINES FOR EXAMINATION IN THE SEM A. Boyd and P. Vesely	265
FREEZING, FREEZE-DRYING, AND FREEZE-SUBSTITUTION A. P. MacKenzie	273
EVALUATION OF MICRODISSECTED, UNFIXED, FREEZE-DRIED TISSUE FOR ULTRAMICROCHEMICAL STUDY R. Thalman , T. H. Comegys and I. K. Arenberg	281
PREPARATION OF RED BLOOD CELLS (RBC) FOR SEM: A SURVEY OF VARIOUS ARTIFACTS M. Bessis and R. I. Weed	289
CRITICAL POINT DRYING, CRYOFRACTURE, AND SERIAL SECTIONING M. K. Nemanic	297
STABILIZATION AND REPLICATION OF SOFT TUBULAR AND ALVEOLAR SYSTEMS: A SCANNING ELECTRON MICROSCOPE STUDY OF THE LUNG J. A. Nowell , J. Pangborn, and W. S. Tyler	305
A NEW IMMUNOLOGIC MARKER FOR SCANNING ELECTRON MICROSCOPE A. F. LoBuglio , J. J. Rinehart and S. P. Balcerzak	313
PREPARATIVE TECHNIQUES FOR THE SUCCESSIVE EXAMINATION OF BIOLOGICAL SPECIMENS BY LIGHT MICROSCOPY, SEM AND TEM V. C. Barber	321
PREPARATION OF FRAGILE BOTANICAL TISSUES AND EXAMINATION OF INTRACELLULAR CONTENTS BY SEM B. J. Panessa and J. F. Gennaro, Jr.	327
EVALUATION OF A NEW PREPARATIVE TECHNIQUE FOR BONE EXAMINATION IN THE SEM D. B. Swedlow , R. A. Harper and J. L. Katz	335
PREPARATIVE TECHNIQUE FOR PLATELET PRESERVATION FOR SEM M. D. Schneider	343
DIFFERENT REPLICA METHODS FOR SKIN EXAMINATION AND THEIR COMPARISON WITH DIRECT STUDIES ON SKIN G. E. Pfefferkorn , H. G. Fromme and M. Pfausch	351
A NEW FREEZE-DRY TECHNIQUE FOR PREPARATION OF MARINE BIOLOGICAL SPECIMENS FOR SEM T. Otaka and S. Honjo	359
<u>General</u>	
TOTAL MATERIAL CHARACTERIZATION WITH THE SCANNING ELECTRON MICROSCOPE O. Johari	364
BIBLIOGRAPHY ON THE SCANNING ELECTRON MICROSCOPE O. C. Wells	375
SYMPOSIUM AND WORKSHOP PROGRAM/1972	443
AUTHOR INDEX.	447