increasing the number of fiducial marks. However, a large number of fiducial marks is practical only when the pointing can be accomplished automatically. The ensuing reduction in the influence of the errors of inner orientation on the elements of outer orientation improves the possibility of studying their absolute accuracy, of making use of auxiliary data and of benefiting from all the advantages offered by analytical methods and the analytical plotter to advance the automation and streamlining of photogrammetric mapping procedures.

Acknowledgment

The author wishes to acknowledge the contributions of Mr. G. Lempereur, who designed the experimental fiducial mark projector and targets and helped in obtaining the results summarized in Table I.

References

- Brandenberger, A., "Fehlertheorie der Inneren Orientierung von Steilaufnahmen," Zurich, 1948.
- Helava, U. V., "Analytical Plotter in Photogrammetric Production Line," Compte rendu officiel du Neuvième Congrès International des Géometres, FIG. 1958, pp. 453–456.

PHOTOGRAMMETRY AS A SCIENCE AND AS A TOOL (AN INDEX)

Compiled by Abraham Anson

AN EXPLANATION BY THE COMPILER

Each succeeding issue of Photogrammetric Engineering from its first publication in 1934 evidences that scientists and engineers in many fields of physics, medicine, law, forestry, geology, cartography and engineering have discovered and demonstrated new uses for photogrammetry.

This compilation contains a selection of papers published in PhotoGRAMMETRIC ENGINEERING which deal with specific problems, beginning with the first volume in 1934 and continuing to 1962. The papers are grouped according to an arbitrary classification for field of interest. In an attempt to avoid duplication, a paper listed in one field could be used to apply to others. Roman numerals indicate the volume; where two numbers are given, the first is the volume and the second is the issue; the author's name is in italics; the number following the volume number is the beginning page. Where one number is included in the bracket, the volume has been successively paginated. Additional references to other publications, where available, have also been listed.

AGRICULTURE AND LAND USE STUDY

- Aerial Color Photography in Agriculture, Some Uses and Limitations of, *Colwell*; XXVI, 220
- Aerial Photos, Use and Interpretation in the Fields of Wildlife and Recreation, Leedy; XVIII, 457; (XIX) 127
- Air Photography (and) Irrigation, Mollard; (Review of); XVII, 181
- Agriculture, Food Production, Kellogg; XVI, 94
- Agriculture, Inventories, Bradshaw; XVIII, 408
- Agriculture, Irrigation, Smith; XX, 515
- Agriculture, Research and Planning; XVI, 299
- Agriculture Production and Marketing, Moyer; XVI, 305
- Applications of Photogrammetry to Land Use Planning, Fagerholm; XXV, 523
- Crop Photointerpretation Report, Goodman; XXV, 131
- Farm Planner uses, Koechley; XXVI, 74

Photo Interpretation, Flood Control Appraisal, Dill; XXI, 112

- Practical Application in Land Classification as Used by the Bureau of Land Management, *Henrique*; XV, 540
- Seasonal Changes of the Agricultural Pattern: A Study in Comparative Photointerpretation, *Brunnschweiler*; XXIII, 131

PHOTOGRAMMETRIC ENGINEERING

Some Uses of Infrared Aerial Photography in the Management of Wildlife Areas, *Colwell;* XXVI, 774

Use of the Comparison Method in Agricultureal Airphoto Interpretation, *Dill;* XXV, 44

AREA PLANNING AND SOCIOLOGY

Aerial Mapping Being Used to Collect Area Land Ownership Data, Lewis, (Review of) XVI, 633 & 638

Aerial Photos, Photogrammetry and Municipal Engineering, King; XX, 789

Aerial Photography for State and Local Planning, Pitkin; XIV, 532

Aerial Urban Land Use in Madison, Wisconsin, Pownall; XV, 414

Aerial Photography, Urban Planning and Research, Review; XVII, 184

Air Maps and Photographs in City, County and Regional Planning, *Black;* X, 189 Applying Photogrammetry to Range Allotment Planning, *Falkner;* XXVI, 672

Application of Aerial Photography to Urban Land-Use Inventory, Analysis and Planning, Report on, *Witenstein;* XX, 419

Application to Engineering City Planning, Woodward; XX, 546

Application of Photointerpretation to Urban Area Analysis, *Witenstein;* XVIII, 490 Associative Method of Regional Photointerpretation, *Heath;* XXI, 589

Aerial Photographic Interpretation and the Human Ecology of the City, *Green and Monier*; XV, 276

British Columbia Land Appraisal, Mahood; XVI, 332

Cities, Photo Interpretation, Green and Monier; XXV, 128

Cleveland's Use of Aerial Photography for City Mapping, Earnest; XIV, 528

Photogrammetry Aids the Production of Planning Maps in Florida, *Beazley*; XX, 81

Photogrammetry and Municipal Engineering, King; XX, 789

Photogrammetry, Key to Engineering Planning of the Cincinnati Metropolitan Area, Kock; XX, 554

Social Structure of the City, Aerial Photography, Green; XXIII, 89

Sociogrammetry, Silberman; XXV, 419

Urban Planning, Bill; XIX, 761

Uses and Limitations of Aerial Photography in Urban Analysis and Planning, Witenstein; XXI, 566

AEROTRIANGULATION-ANALOGIC (INSTRUMENTAL)

Aerotriangulation, Stereotemplets, *Hughes*; XXIV, 732

Aerotriangulation with Convergent Photography, Pennington; XX, 76

Aerotriangulation Adjustment at Army Map Service, Price; XIX, 627

Aerial Triangulation, Research Report; XXV, 301

Aerial Triangulation with the Stereoplanigraph. Brandt; XVI, 577

Control Extension by Photogrammetric Methods, Dickerson; XIX, 533

Control of Photogrammetric Mapping, Theurer; XXIII, 318

Determination of Correction of Systematic Errors in the Fundamental Operations of Aerial Triangulation, *Hallert;* XXIII, 799

Determination of Nets of Points by Means of Aerotriangulation and Their Adjustment, Zeller, Review; XVII, 489

How Aerotriangulation Can Reduce Ground Costs, Olmstead; XXV, 623

Large and Intermediate Scale Mapping. Aerial Triangulation, Blachut; XVI, 569

Measuring Accuracy and its relation to Model Deformation and Other Measurements Made in a Stereo Model, *Mahoney*; XXII, 764

Photogrammetric Cadastral Survey in Utah, VanZandt; XXV, 626

PHOTOGRAMMETRY AS A SCIENCE AND AS A TOOL

Practical, Procedure to Carry Out Spatial Stereotriangulation, Nistri; XXI, 132
Simplified Analytical Method for Adjusting Aerial Triangulation, Owen; XIX, 491
Some Theoretical and Practical Problems in Photogrammetric Bridging, Zarzycki; XXI, 725

Aerotriangulation-Analytic

- Aerotriangulation Analytic Instrumentation, Bodnar; XXIII, 927
- Aerotriangulation, Analytic, Jerie; XXII, 40
- Aerotriangulation, Analytic, Pepper; XXIV, 82

Aerotriangulation, Analytic, Roth; XXIV, 100

Aerotriangulation, Reseau, Sadler; XXIV, 132

Aerotriangulation, Analytic, Shu and McNair; XXII, 637

Aerotriangulation, Cantilever, Shu and McNair; XXIII, 717

Analytic Aerotriangulation, Zurlinden; XXIII, 659

Analytical Aerotriangulation by Direct Geodetic Restraint Methods, *Dodge*; XXV, 590

Analytic Photogrammetry as Applied to Flight Testing, Schmid; XXI, 680

Application of Photogrammetric Flash Triangulation to Global Surveys, Kelley; XXVI, 590

New Approach to Analytical Triangulation, Stringham; XXVI, 596

Determination of Spatial Position and Attitude of a Bombing Aircraft by an Airborne Photogrammetric Camera, *Schmid*; XXI, 115

Electronic Analytic Photogrammetry, Doyle; XIX, 739

Electronic Computers Analytic Aerotriangulation, Schmid; XX, 765

Electronic Computer Mapping, Kosofsky; XXIV, 458

Experiences with Analytical Methods in Photogrammetry, Schut; XXVI, 564

Cantilever Aerotriangulation, Anderson; XXVII, 64

Mathematical Formulation of Analytical Aerotriangulation, Schut; XXIV, 95

Precision Photogrammetry in Missile Testing, Brown; XXV, 372

Precision Photogrammetry, A Tool of Geodesy, Schmid; XXVII, 779

Trends in Automatic Photogrammetry, Tewinkel; XXVII, 537

Aerotriangulation-Graphic

Aerotriangulation, /Trimatrogon, Silbert; XXIV, 113 Aerotriangulation, Slotted Templets, Visser; XXIV, 113

ARCHAEOLOGY AND GEOGRAPHY

Aerial Photography, Archaeology, Solecki; XXIV, 798

Application of Aerial Photographs to Field Research in Cultural Geography, Stokes; XX, 802

Archaeology, Nova Scotia, Cameron; XXIV, 366

Application of Aerial Photographs to Geographic Studies in the Gulf Coast Region, *Tator;* XVII, 716

Application of Photointerpretation to Geographic Research, *Quam*; XVIII, 500

Some Aspects of Field Use of Aerial Photographs by Geographers Foster; XVII, 771

Use of Aerial Photographs, Research in Physio-geographic Conditions and Anthropogeographic Data in Various Historic Periods, *Kedar*; XXIV, 584

TRANSMISSION AND PIPELINE LOCATION

Aerial Photography, Profiling of 132KV Line Cuts Engineering Costs in Two, A Review; XVI, 630

PHOTOGRAMMETRIC ENGINEERING

Oil Pipeline Survey, Bartlett; XVII, 548

Photogrammetry as Applied to Pipeline Location, DeSantos; XIX, 85

Use of Aerial Photographs, Electric Transmission Line Location, Tubbs; XVIII, 652

BIOLOGY, MEDICINE AND DENTISTRY

Stereophotogrammetry in Animal Husbandry, Leydolph; XX, 804

Oral Radiography, Berghagen; XIX, 655

- Dentistry, Zeller; Microphotogrammetrical Examination of the Surface of Tooth Fillings; XIX, 660.
- Method of Measuring Volume Movements of Impression, Model and Prosthetic Base Materials, *Nyquist* and *Tham*; XIX, 670

Photogrammetric Application in Dentistry, Tham; XIX, 669

- Determination by the aid of an X-Ray Stereoscopic Method of Volume Variations of the Liver of Animals, *Hjelmstrom*; XIX, 663
- Factors in Human Vision Applicable to Photogrammetry, Salzman; XV, 637

Medicine, Dentistry, Hjelmstrom; XIX, 731

Medicine, Halsman; XXII, 374

A New Method for Intra Oral Radiography, Berghagen and Hjelstrom; XIX, 655 Photogrammetry and Medical Research, Adams-Ray; XIX, 652

Stereophotogrammetry as an Anthropometric Tool, *Hertzberg*, *Dupertius* and *Emanuel*; XXIII, 942

- Photogrammetric Determination of Surface Area (Human), Pierson; XXVII, 99
- Accuracy of Human Bone Composition Determination from Roentgenograms, Baker, Shraer and Yelman; XXV, 455
- Photointerpretation Application to Radiation Studies of Survivors of the Hiroshima and Nagasaki Nuclear Explosions, *Monier* and *Vent*; XXV, 787
- Significant Findings of a Stereoscopic Acuity Study, Anson; XXV, 607
- The Application of Photogrammetric Techniques to Medical Problems, Miskin; Photogrammetric Record, II, 8, 1956
- A Photogrammetric Method of Measuring the Volume of Facial Swellings, Bjorn, Lundquist and Hjelmstrom; Journ. Dental Res. June, 1954

CADASTRAL APPLICATIONS OF PHOTOGRAMMETRY

Large Scale Photogrammetry and Ground Surveys, Their Relationship and Integration, Smith; *The Canadian Surveyor*, XIV, 2, 1958

The Utilization of Aerial Photographs in Cadastral Surveying, Wright; I, 6, 13

Methods and Procedures for Making Cadastral Maps by Aerial Photogrammetry, M. Tucci; II, 1, 27

The Use of Aerial Photographs in Cadastral Surveys, Whitmore; II, 3, 28

Photogrammetry in Cadastral Surveying, King; XXIII, 493

Photogrammetric Cadastral Survey in Utah, Van Zandt; XXV, 626

Photogrammetry and the American Cadastral Surveyor, Masters; XXVI, 469

Photogrammetry for the Cadastral Surveyor, Schermerhorn and Witt; Photogrammetria, X, 2, 1953, p. 45

ELECTRONIC MAPPING

Airborne Photogrammetric Radio Equipment, Gehrke; XXI, 412

Airborne Profile Recorder; XVIII, 180

Alaska Airborne Profile Recorder Test; XVIII, 94

Analysis of Radar Profiles over Mountainous Terrain, *Lyytikainen;* XXVI, 403 Application to Radar Research Studies, *Leonardo;* XXV, 376

Evaluation of an APR System for Photogrammetric Triangulation of Long Flights, Slama; XXVII, 572

Photographic Method for Transformation of A Black and White Radar Map into a Full Color Presentation, Leonardo, *Tolliver*; XXVI, 647

Photogrammetric Applications of Radar Scope Photography, *Hoffman*; XXIV, 756 Radar Charting, A New Application of Photogrammetry, *Podeyn*; XIV, 114

Terrain Radar Reflectance Study, Newbry; XXVI, 630

Use of Doppler Radar in Present and Future Mapping Operations, Meier; XXV, 632

FORESTRY

Aerial Photos in a Tropical Country, Symposium; XVIII, 144

Aerial Photographic Interpretation of Natural Vegetation in Anchorage Area, Stone, Review of; XVII, 186

Air Photo Inventory of Pulp in Water Storage, Young, Laverty and Stoeckeler; XXII, 696

Air Photography Applications of Forestry, Seely; XV, 548

Air Photography Interpretation in the Chimney Cotner-Cheticamp Area, Cape Breton Island, N. S. Cameron; XV, 238

Application of Photogrammetry to Forestry in Canada, Losee; XVIII, 742

Arctic Botanical Interpretation, Sigafoos; XVI, 429

Construction of Landform Keys, Waldo, Ireland; XXI, 603

Effects of Photographic Scale on Tree-Height Measurements, Johnson; XXIV, 141

Evaluation of Several Camera Systems for Sampling Forest Insect Damage at Low Altitude, Heller, Aldrich and Bailey; XXV, 137

Forestry Applications of Color, Aerial Photography, Becking; XXV, 559

Forest Inventory, Practical Photogrammetry, Stanton; XIX, 805

Indirect Determination of Forest Stand Variables from Vertical Aerial Photographs, Willingham; XXIII, 892

Interpretation, Photographic, Forest Inventory, Garver; XIX, 117

Interpretation, Photographic, Forest Inventory, Moessner; XVIII, 453

Jungle Mapping, Mott; XXI, 426

Measurements of Crown Diameter and Crown Cover and Their Accuracy for 1:12,000 photographs, *Worley* and *Meyer*; XXI, 372

Photogrammetric Methods of Reforestration Surveys, Swantje; XXIII, 789

Photogrammetric Volume Determination of Huge Pulpwood Piles, Young; XX, 808 Photogrammetry Aids Forest Management, Calder; XVIII, 653

Photogrammetry for Practicing Foresters and Woodland Managers, Stanton; XIX, 805

Photography, Color for Forestry, Waldo; XVI, 327

Photography, Color, Forestry, Hindley, Smith; XXIII, 894

Recognition of Tree Species on Air Photographs by Crown Characters, Sayn-Wittgenstein; XXVII, 792

Spectrophotometric Analysis of Foliage of Some British Columbia Conifers, *Hindley*, *Smith*: XXIII, 894

Use of Aerial Photographs, Forest Survey in California, Bradshaw; XVI, 315

Guatemala Forest Survey, Mason and Wood; XVIII, 141

Forest Survey Design Applying Aerial Photographs and Regression Techniques for the Caspian Forest of Iran, *Rogers*; XXVI, 441

GEOLOGY

Aerial Surveys and Oil Exploration, *Schneeberger*; XVIII, 753 Aerial Photos Soil and Minerals Inventories, *Belcher*; XVIII, 456 Aerial Photographs and Applied Geomorphology, *Tator*; XXIV, 549 Airborne Photo Interpretation, Belcher; XIX, 421

Air Photo Criteria of Ore Localization in the Corbin Wickes Mining District, Jefferson County, Montana, Levings and Herness; XIX, 450

- Air Photo Interpretation Aid in Mineral Reconnaissance and Development, *Lueder*; XIX, 819
- Air Photo Interpretation Engineering Sites and Materials. Hittle; XV, 589
- Air Photo Interpretation Mining and Engineering Geology in Canada, Cameron; XVIII, 458
- Air Photo Interpretation in Natural Resources Inventories, Cameron, XIX, 481

Color Aerial Photographs Facilitate Geologic Mapping on the Atlantic Coastal Plain of New Jersey, *Minard*; XXVI, 112

Color Aerial, Photography in Photogeologic Interpretation, Fischer; XXIV, 545

Determination of Dip and Strike by Indirect Observations in the Field and from Aerial Photographs, a Solution by Stereographic Projection, *Wallace*, Review: XVII, 186

Drainage Anomalies in Coastal Plains Regions, Tator; XX, 412

Exceptional Meander Scars and their Significance in Determining the Direction of Stream Flow, *Kelly* and *McGuire*; XXI, 110

Experiments in the Use of Color Photographs for Analysis of Soil and Terrain, Frost; XIX, 427

Geology, Paleozoic Rock Characteristics, Monument Upwarp, Utah, Wengerd; XVI, 770

Geology, Reconnaissance, Tropical, Zonnerveld and Cohen; XVIII, 151

Geology, Shore Processes, Shepard; XVI, 756

Geology, Subarctic, Surficial, Benninghoff; XIX, 487

Geomorphology (and) Photogeological Study of the "Flat Land," Melton; XVI, 722

Ground Conditions and Polygonal Patterns from Aerial Photographs, *Black*; XVIII, 123

Ground Water, Interpretation, Howe; XXIV, 35

Interpretation, Photographic, Airfield Engineering, Elias XVIII, 459

Interpretation, Photographic, Arctic Vegetation, Surficial Geology, Benninghoff; XVI, 428

Interpretation, Photographic, Glacier Land Forms, Powers; XVII, 776

Mapping Glaciers in Alaska, Case; XXIV, 815

Performance Estimate Comparing Conventional Geologic Mapping with that Accomplished with the Aid of Color Photographs, Laylander; XXII, 853

Petroleum Surveys, Ammann Company; XX, 244

Petroleum Surveys, Belcher & Associates; XX, 246

Petroleum Surveys, Geophoto Services; XX, 250

Panel on Photogeology (Moderator W. A. Fischer) XXII, 841

Several Uses of Airphoto Interpretation to the Soils Engineer, Holman

Status of Photogeology in the U. S. Geological Survey, Ray

Eagles of Geology, Christensen

Photo-Field Prospecting, Goodman; XXVI, 100

Photogeologic Instruments Used by the U. S. Geological Survey, Fischer XXI, 32

Photogeology, Coral Reefs, Teichert and Fairbridge; XVI, 744

Photogeology, Drainage Patterns, Paris; XVI, 387

Photogeology, Glacial Features, Frost and Mollard; Review XVI, 632

Photogeology Interpretation, Literature, Smith; XIX, 675

Photogeology, Petroleum, Wasem; XV, 579

Photogrammetric Mapping of Sand Beds in a Hydraulic Test Flume, *Thompson*; XXIV, 469

Photogrammetric Method for Tridimensional Measurement of Sand Grains, Aschenbrenner; XXI, 376

Present Status of Photointerpretation in Earth Science, Smith; XIX, 137

Problems and Progress in Reconnaissance Photogeologic Evaluation, Brundall; XVIII, 483

Procedures and Problems of Photogeologic Evaluation, Thurrell; XIX, 443

Project Glacier, and Improved Method of Recording a Glacial Advance, Servizi; XXIII, 550

Quantitative Photography—A Geologic Research Tool, Ray and Fischer; XXVI, 143 Simple Stereophotographic Field Method of Rock Outcrop Description for the Geologist, Prusok and Ege; XXVI, 98

Small Scale Photographs in Photogeologic Interpretation, Hemphill; XXIV, 562

Status Interpretation in Natural Resource Inventories-Photomagnetometer Interpretation, Belcher; XIX, 421

Structural Contouring for the Photogeologist, Desjardins; XVI, 784

Technique Mapping Geologic Fracture Traces and Lineaments on Aerial Photographs, Lattman; XXIV, 568

Experiments in the Use of Color Photographs for Geologic Study, *Kent*; XXIII, 865 Movement of Barchan Dunes Measured by Aerial Photogrammetry, *Finkel*; XXVII, 439

HIGHWAY ENGINEERING

Aerial Photos and Highway Engineering, Interpretation; Padilla; XX, 792

Aerial Photos Streamlines Ohio's Highway Program, Meyer; XIX, 771

Air Photo Analysis of Terrain for Highway Location Studies in Maine, Stoeckeler and Gorrill; XXV, 85

Aerial Photography Use by the Ohio Highway Department; XX, 892

Aerial Surveys and Photogrammetric Methods of Highways, Wright; XXIII, 927 Alaska Highway, Geology Reference; XIX, 677

Applications of Aerial Strip Photography to Highway and Airport Engineering Hittle; Review of; XVI, 632

Application (to) Highway engineering, Pryor; XX, 520

Application of Photogrammetric Methods of Highway Location and Design, Funk; XVII, 800

Continuous Strip Photography—An Approach to Traffic Studies, Wehl and Sickle, XXV, 397 Part 2; (25) 740

Contractors Acceptance of Measurements Made by Photogrammetric Measurements *Parks*; XXIII, 762

Control of Specifications, Highways, Telford; XIX, 570

Engineering Applications of Photogrammetry, Panel; Cottrell, Dickerson, Kock, Pennington, Pryor, Smith, Warnick, Woodward; XX, 515

Forest Service Photographic Aids in Expediting Road Location and Design, Massie; XXIII, 923

Group Meeting on Aerial Photography and Photogrammetry Applications to Highway Work, Report on, Gracie, *Gordon*; XXV, 693

Highways, Use of Photogrammetry, Fulton; XXII, 405

Highway Location, Use of Aerial Photographs, XXI, 778

Impact of the New Highway Program on Photogrammetry, Miller; XXII, 834

Interpretation, Photographic, Highways, Soils, Terrain, Frost; XIX, 427

Obtaining the Optimum Value from Photography and Photogrammetry in Highway Engineering, Sheik; XXIV, 155

Ohio Adopts Aerial Photography to Highway Engineering, Lehman; XV, 91

Photogrammetric Engineering Firms Contribution to the New Highway Program, *Wood*; XXIII, 737

Photogrammetry Aids Highway Engineers, Quinn; XVIII, 787

Photogrammetry, Highway Engineering; XVI, 86

Photogrammetry (and) Road Location in the U. S. Forest Service, *Carnahan*; XXIV, 405

Potential Future Use of Photogrammetry in Highway Engineering, Cude; XXIII, 558 Specifications for Aerial Photography and Mapping by Photogrammetric Methods

for Highway Engineering Purposes, Pryor; XVI, 439

Utilization of Photogrammetric Mapping and Electronic Computers for Highway Design, *Gavaris*; XXIII, 920

Use of Photogrammetric Methods in Traffic Studies; Driver Eye Height, Turpin, Lee, XXVII, 79

Hydrography

Accuracy, Stereo-Photography and Ocean Waves, Marks; XXI, 107

Aerial Photos, Water and Snow Inventories, Hall; XVIII, 455

- Aerial Photography, Data of River Current, Oros; XVIII, 96
- Aerial Photographs of the Relative Surface Velocities of Water, The Determination of, Canadian Surveyor; III, 1, 50

Application to Hydrographic Surveying, (of) Photogrammetry. *Medina*; III, 2, 1 Application of Photogrammetry to Hydrographic Charts, *McCurdy*; III, 2, 4

- Application of Photogrammetry to Flood Control in the Tulsa District of the U. S. Engineers, *Mead*; VIII, 30
- Application of Aerial Photographic Interpretation to the Investigation of Hydrology Problems, *Howe*; XXVI, 85

Aerial Photographic Investigation of Leaching and Sapping as an Erosion Process, McBeth; XXVII, 154

Deep Sea Underwater Photography and Some Recent Stereoscopic Applications, Owen; XVII, 13

Delineation, Coastal, McCurdy; XVI, 550

Depth Determination, Underwater, Seiwell; XV, 171

Hydrographic Application of Photogrammetry in the U. S. Coast & Geodetic Survey, *Tewinkel;* XXII, 263

Low-Water Photography in Cobscook Bay, Maine, Jones; XXIII, 339

Measurement, Water Current Velocities by Parallax Methods, *Cameron*; XVIII, 99 Plotting of Water Currents by Photogrammetry, *Forrester*; XXVI, 726

- Photogrammetric Surveys for Nautical Charting, Use of Color and Infrared Photography, *Swanson*; XXVI, 137
- Some Applications of Terrestrial Photogrammetry to the Study of Shorelines *Pincus*; XXV, 75

Surveying the Deep Sea Floor with Cameras, Shipek; XXVII, 84

Use of Aerial Photographs, Hydraulic Problem Solution, Flaxman; XVIII, 651

Underwater Depth Determination by Aerial Photography, Lundahl; XIV, 454

MAPPING-GENERAL

Account of Simplified Methods of Mapping from Trimetrogon Photographs Used in the Anglo-Egyptian Sudan, *Wright;* XVIII, 522

Airborne Survey in North Africa; XVI, 634

Alaska Aerial Survey, Pollock; XV, 276

Application of Photogrammetry (in) Brazil, Fagundes; XVII, 108

Applied Photogrammetric Methods in Eastern Venezuela; Lan; XXIII, 71

- Arctic Mapping Panel, Boyer, Fitzgerald, Gremmler, Ney, Nicholson, Nowicki, Paton, Ross, Smith, Thomas, Treadwell, Waugh XIX, 375 seq.
- Brooks Range, Photogrammetric Mapping of, Blake XXV, 679
- Contouring Flat Areas, Mott; XXI, 431
- High Altitude Long-Focus Convergent (Halcon) Mapping System, Halbrook; XXIV, 661
- Jungle Mapping, Mott; XXI, 426
- Large Scale Mapping in Israel, Blachut; XVI, 569
- Large Scale High Precision Mapping, Dawe; XVI 142
- Large Scale Small Contour Interval Topographic Mapping, Woodward; XVII, 364 Mapping, Ungava Peninsula, Gamble; XXIV, 410
- Medium Scale Charting—A Challenge to Photogrammetry, Hart; XXII, 956
- Photogrammetric Engineering and Field Scribing, Altenhoefen; XXII, 917
- Photogrammetry Saves Dollars-Don't Hide the Shining Facts, Panel Discussion, Stoneman; XX, 467
- Lunar Mapping, Brandenberger; XXVII, 42
- Photo Topography for Lunar Charts 1:1,000,000, Carder; XXVII, 386
- Role of Photogrammetry in National Defense, Pick; XVII, 35
- Some Considerations on the Application of Photogrammetry for Small Scale Cartography, *Kasper*; XXII, 875
- Spain, Photogrammetry in, Mendoza; XVI, 433
- Photo-Contour Map: A Topographic Map Accepted Accuracy Standards where Planimaetric Detail is provided by The Aerial Photographic Image, *Mahan*; XXIV, 451

SOIL STUDIES

- Accuracy, Soil Maps prepared by Various Methods that Use Aerial Photograph Interpretation, *Pomerening* and *Cline*; XIX, 809
- Aerial Analysis of Permanently Frozen Ground, Sager; XVII, 551
- Aerial Photography, Requirements for Soil Survey Field Operations, Swanson; XX, 709
- Air Photo Inventory, Patterns of Soils in the Western U. S., Frost and Woods; Review of; XVI, 631
- Application (of) Terrestrial Photogrammetry in Glaciology in Greenland, Jury; XXIII, 543
- Aerial Maps in Soil Conservation Studies, The Use of, C. W. Collier; II, 2, 21
- Aerial Photography as applied to the Agricultural Conservation Program of the Agricultural Adjustment Administration, *Coblentz*; III, 1, 35
- Aerial Photographs in Soil Mapping, The Use of, *Baldwin*, *Smith*, *Whitlock*; XIII, 532 Determination of Soil Conditions from Aerial Photographs, *Belcher*; XIV, 482
- Determination of Sand Grain Sphericity by Stereo Microphotography, Goodman; XXV 58
- Frost Problems and Photo Interpretation of Patterned Ground, *Thoren*; XXV, 779 Simple Applications of Photogrammetry in the Soil Conservation Service, *Koechly*, XXVI, 74
- Soils Mapping of Indiana from Airphotos, Engineer, Montano; XVIII, 719
- Soil and Terrain Analysis, Factors limiting the Use of Aerial Photographs for, Frost; XIX, 427
- Ground Water Interpretation, Howe; XXIV, 35

Some Military Applications of Photogrammetry

 Atomic Bomb Attack, Estimating Damage and Casualties from, Cozzens; XVIII, 105
 Additive Color Photography and Projection for Military Photo Interpretation Winterberg, Wulfeck; XXVII, 450 Integrated Photo Reconnaissance System for High Performance aircraft, *Doyle*; XXI, 75

Interpreting the Military Aerial Photograph for Tactical Use, Conklin; XX, 459

Preferred Approach to the Military Interpretation of Industries, *Bigelow*; XXI, 579 Principles of Application of Photo Interpretation to Engineer Intelligence, *Witenstein*; XVII, 349

Military Uses of Aerial Photographs, Arnold; VII, 90

General Applications of Photogrammetry in the Present War, Loper; IX, 176

Photogrammetry in the Netherlands During the Occupation, *Scherpbier*; XII, 230 Military Photogrammetry in Action in Europe, *Locke*; XII, 272

Military Mapping, Mills and Nowicki; XIV, 40

Role of Photogrammetry in the "Open Skies" Program, Whitmore; XXIV, 377

Strategic Target Analysis, Walsh; XIV, 507

Use of Aerial Photographs in the Construction Military Terrain Models, Spooner; XIV, 513

Special Purpose Photogrammetry

Application, Photogrammetry to Structural Research, Jackson; XXI, 71

Crime Laboratory Photography, Webb; XVIII, 111

Architectural Photogrammetry at Ohio State, Borchers; XXIII, 937

Aircraft Position Location by Single Photograph Technique, *Cameron;* XXV, 743 Deformation Measurements by Photogrammetric Methods, *Hallert;* XX, 836

Determinations of Small Deflections in Aerodynamic Models, *Sherby;* XXV, 395 Determination of Interior Orientation of Cameras for Non-Topographic Photogrammetry, Microscopes, X-Ray Instruments and Television Images, *Hallert;*

XXVI, 748

Environmental Effects of Supersonic and Hypersonic Speeds on Aerial Photography, Neilsen, Goodwin; XXVII, 427

Choice of Station and Control for Efficient Orientation and Plotting in Architectural Photogrammetry, *Borchers*; XXVI, 713

Cumulus Cloud Photogrammetry, Orville; XXVII, 787

Length Measurement of Migrating Salmon by Paired Underwater Cameras, *Thompson* and *Clancy*; XXV, 449

Photogrammetric Measurements in Structural Research, Wei-Wen Yu; XXV, 611

Photogrammetric Technique for Studying Atmospheric Diffusion, Wasco, Moses; XXVII, 92

Photographic Study of Aerosol Particles in a Thermal Gradient, *Sholtes*; XXVII, 710

Present and Future Capability of Optical Systems with Emphasis on the Ballistic Camera Operation, *Rosenfield*; XXVII, 51

Photogrammetry Applied to Non-Topographic Fields, Lacmann, Review of; XVI, 625

Photogrammetry and the Photography of Motion, Waddell; XXII, 351

Quantitative Photography, The Fragmentation of a Science, St. Thomas; XXII, 467

Torsion Constants of Certain Cross Sections by Non-Topographic Photogrammetry, Bonnano; XXIV, 803

Use of Photogrammetry in Architecture and Other Civil Engineering Construction, *Plotnick*; XXV, 553

Validity of Stereophotogrammetry in Volume Determination, *Pierson;* XXV, 83 What is Photosculpture? *Saraleugi;* XX, 29