

## NOTES ON RECENT LITERATURE

*Robert H. Kingsley*

Anderson, R. O., *Applied Photogrammetry*; 519 pp., Edwards Brothers, Inc. Ann Arbor, Mich. 1946, \$6.00.

Photogrammetrists will recognize Mr. Anderson's 4th edition of *Applied Photogrammetry* as a master collection of his works. His latest contribution to the science of photogrammetry represents the culmination of more than ten years of plain hard work to bring to the engineering public some mighty handy tricks of the trade—plus plenty of substantiating mathematics for good measure. Mr. Anderson's boundless enthusiasm and great perseverance are reflected in the many methods devised for extracting engineering data from aerial photographs.

While Mr. Anderson's previous works have dealt primarily with a treatment of a particular phase of photogrammetry, the 4th edition has an increased scope and revises and expands the material presented in the earlier editions. Consisting of fifteen full chapters and six appendices the amassed total of 519 pages gives the elements of photogrammetry a thorough going-over. Main chapters in the book deal with methods of scale determination, the theory and use of the scale point and equivalent elevation, various methods of tilt and elevation determinations for both vertical and oblique photographs and the graphical, analytical and mechanical expansion of horizontal and vertical control utilizing the radial line principle. The appendices largely cover specialized studies of particular problems omitted in the body of the book.

*Applied Photogrammetry* does not encompass automatic plotting machines and stereoscopic mapping methods but goes into great detail with scale and tilt determination of the individual photograph and comes up with methods involving practically no equipment save a scale and a triangle with perhaps a calculating machine, if handy. The key to Mr. Anderson's works is the development of the equivalent elevation and the scale point and these features are notably lacking in practically any other photogrammetrical publication for three reasons. First, Mr. Anderson personally is largely responsible for the development of the scale point and equivalent elevations; secondly, these features are useful primarily for a specialized phase of photogrammetry and third, some have considered the scale point and equivalent elevation method as an inaccurate approach to the scale determination problem. The first two reasons need no additional comment but the criticism of inaccuracy this writer considers unfounded especially from the practical viewpoint. Mr. Anderson, acting in the role of crusader on this score, has developed successive refinements that may be applied for excessive tilt and elevation change such that even inconsequential discrepancies may be reduced to nil. As to how infrequently it is necessary to apply even the first refinement, called "convergence correction" this writer is familiar with a vast scale and tilt determination program where for thousands of determinations the correction was appropriate in less than one tenth of one percent of the cases to keep the discrepancy in datum scale under one-tenth of one percent and tilt determination under  $0^{\circ} 10'$ .

For those unfamiliar with equivalent elevation and scale point method, the equivalent elevation method embodies a dropped perpendicular from photo-center to establish an elevation at which the photographic scale (ground distance divided by photo distance) is effective. Scale point utilizes same dropped perpendicular approach to establish in the plane of the photograph, a position

at which a datum scale is effective as scale parallel to tilt axis regardless of direction of tilt axis. Both are established very simply and subsequent operations to fix datum scale at isocenter and determine tilt through ratio change are equally simple.

Mr. Anderson's style of developing methods and formulas in a few cases will be found somewhat unorthodox since instead of first arriving at a big long formula that will work in every case and then knocking it down for practical usage, he has developed something that will work in practically every case and then proceeded to take care of the exceptions. In any event the end results are comparable. The book contains discussion and formulas for expressing datum ratios for both the scale factor ( $SF$ ) and its reciprocal the representative fraction ( $RF$ ). Many of the derivations are developed by several different methods; for example, the basic tilt formula is developed five different ways. Practically all of the chapters are replete with numerical examples for checking formula and showing common and unusual cases of tilt and relief. As mentioned previously the 4th edition contains abundant material, much untouched in this review. Complete absorption of all the material presented will undoubtedly make the reader first cousin to the aerial photograph.

It is known that the compilation of Applied Photogrammetry, 4th Edition, has consumed most of Mr. Anderson's spare hours for a long time and it is felt that much credit is due him and personnel associates of TVA for making the material available. Book is well bound with the many illustrations clear and complete and is recommended as a valuable reference, particularly to those interested in horizontal and vertical control expansion, and scale tilt and elevation determination in general.