

If more than three copies of single exposures and/or enlargements are required, glossy prints should be ordered for best results for copying. Copies can be made by any commercial photographer and additional prints or enlargements produced in the size or quantity required.

The entire photo collection in ten volumes is available for review at the Photographic Records and Services Division in the Pentagon (Room 1E 383).

If an example of land form in a particular area is desired, but is not in this collection, a map of reasonably large scale outlining the exact area wished, should be forwarded with the order, and efforts will be made to fulfill the request.

Requests should be addressed to: Photographic Records and Services Division, USAF Aeronautical Chart and Information Center, Washington 25, D. C.

Examples which might be added to this collection will be appreciated, either an actual photo or references adequate for obtaining it.

Address all such information to the author.

ABSTRACT OF THESIS—CONTRIBUTIONS TO THE STUDY OF ANTARCTIC SURFACE FEATURES BY PHOTOGEOGRAPHICAL METHODS*

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THE employment of airphoto interpretation as a geographic research technique is termed photogeography; those skilled in this practice are called photogeographers.

Airphoto coverage is comparable to or exceeds adequate map coverage for most areas. Recent developments in optics, emulsions and film processing have improved resolution and increased the value of aerial photography as a tool of science. But neither complete airphoto coverage nor fine resolution will enable photogeographers to interpret accurately the myriads of airphoto images of the objects, conditions, situations, patterns and relationships which comprise the landscape, particularly if the investigators are not familiar with them as they exist on the ground.

The most practical solution to this problem yet devised is the systematic derivation and compilation of selected, pertinent, annotated airphoto images, called photo interpretation keys. Effective utilization of photo interpretation keys varies proportionately with the interpretation experience and professional competence of the investigator.

Approximately 350 such keys are presented for the iceforms and landforms of the Antarctic. These include keys for glaciers, ice tongues, shelf ice, icebergs, snow, firn, glacier ice, sastrugi, snowdrifts, crevasses, radiation, meltwater, moraines, mountains, coastlines, islands, Antarctic phenomena, flora, fauna and settlement patterns. The Airphoto research required for the derivation and establishment of these keys also produced new information concerning the morphology of these features and of others not mentioned in the literature, e.g., "channel glaciers," "floating fissures," "reentrant rifts," "ice morasses" and "right angle drifts."

In research concerning areas of limited accessibility, it is sometimes necessary for the geographer to rely upon information derived from the airphotos alone. But since the actual landscape may differ from that conceived solely

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through airphoto interpretation, the latter is called "airphoto landscape." Field and library research may be applied to the "airphoto landscape" to resolve any differences between it and the actual landscape.

The Ingrid Christensen Coast of Antarctica, was selected as a demonstration area of limited accessibility. Preliminary airphoto analysis permitted the division of this cast into eight morphological areas which are described and analyzed from their airphoto images. In proving the value of utilizing photogeographical methods in areas of limited accessibility, the study has provided: (1) the first precise description of the major physiographic features of the area, (2) revised maps of this coastline, showing newly discovered fiords, inlets, islands, peninsulas, ice tongues and inland features, (3) observable evidence relative to a probable uplift resulting from glacial unloading, (4) observable evidence of the metamorphic character of the bed rock along this coast which was formerly described as sedimentary and igneous, (5) the delineation and analysis of the ephemeral Sandefjord Ice Bay, (6) the delineation, analysis and rate of movement of the dynamic Publication Glacier Tongues, formerly thought to be shelf ice and (7) the discovery, delineation and first mapping of the Baker Three coastal area. In addition, numerous problems were isolated which merit future study.

Unusual items among the illustrative and appended materials include an Antarctic surface trafficability chart; nomographs for the duration of sunlight and civil twilight in the Antarctic; original maps, revised maps and annotated airphotos of the Ingrid Christensen Coast; a map of the airphoto coverage of Antarctica; a bibliography of photo interpretation bibliographies and a bibliography of Antarctic bibliographies.

THE USE OF AIR PHOTOS FOR TERRAIN INTERPRETATIONS AT LONG RANGE*

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TERRAIN analysts of the U. S. Geological Survey use air photos in conjunction with field work and as a valuable source of information in making office studies of remote areas when field investigations are impracticable.

Air photos are more usable for detailed interpretations involving small areas, such as individual airfield sites, than they are for small-scale studies covering large areas. The large number of photos required to cover an entire country, for example, makes their use too cumbersome, and they are generally not necessary except where there are few if any other sources of information.

Although indispensable for studies of little-known areas, air photos also have value in well-known areas. For the latter, air photos serve as an additional source of information and have a unique value in delimiting and refining boundaries of known terrain elements, and in providing details beyond those available from published topographic, geologic, soils, and vegetation maps. Within limits, air photos can thus substitute for additional ground surveys.

A representative example of interpretation in well-known areas is presented by a study made by the U. S. Geological Survey, estimating the airstrip construction problems in a selected area at Fort Bragg, North Carolina. The esti-

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