FIG. 1. Marginal Moraine, Walworth Co., Wis. (XB-3R-98-99).

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Landform Features in the United States

An airphoto index to selected landforms in the Eastern, Midwestern, and North Central regions.

INTRODUCTION

THIS IS AN INDEX to ASCS[1] airphotos of selected landforms in the Eastern, Midwestern and North Central United States. It contains examples from 56 sites in 36 counties in the area covered. This landform index is intended as a supplement to the general index prepared by Avery and Richter which appeared in the September 1965 issue of this publication.[2] Their list made reference to a wide variety of physical and cultural features. The list presented here deals only with airphotos that show examples of geologic landforms, especially those of engineering significance. Students and teachers of geology, engineering, and airphoto interpretation may find this list helpful in building their airphoto collection of geologic landforms.

[1] The term abbreviated as "ASCS" refers to the Agricultural Stabilization and Conservation Service of the United States Department of Agriculture.

[2] Avery and Richter, 1965, "An Airphoto Index to Physical and Cultural Features in Eastern United States," PHOTOGRAMMETRIC ENGINEERING, Vol. XXXI, No. 5 (September 1965), pp. 896–914. (See also the supplemental material by Dr. Salome in Vol. XXXII, No. 6 (November 1966), p. 920.—*Ed.*)

List of Airphotos

The list of airphotos which accompanies this article contains examples from 36 counties in the Eastern, Midwestern, and North Central United States. All airphotos listed are from areas that fall within the "Humid Continental" climatic region of the United States. All airphotos of glacial features are of areas of Wisconsin (age) glacial drift.

The list contains a brief description of the landform shown on each set of airphotos according to the landform classification system used by Donald R. Lueder in his book *Aerial Photographic Interpretation* (McGraw-Hill, 1959). The list also contains all information required to order the photographs from the ASCS, including County, State, County symbol, roll number, exposure number, and date. The photo index sheet number on which the airphotos are located is shown as well as the appropriate USGS[3] topographic map. The topographic map name listed is the largest scale topographic map known to exist of the area covered by the airphotos.

Each set of airphotos contains from two to five individual airphotos, depending on the number required to give adequate stereo coverage to the landform featured.

Abstract: *A list of airphotos and topographic maps illustrating selected landforms in the Eastern, Midwestern, and North Central United States is presented. Eight stereo-pair airphotos are shown as examples. Teachers of geology, engineering and airphoto interpretation may find this list helpful in building their airphoto collection. This list is intended to provide the nucleus of a landform collection to which additional photos and maps can be added as time and budget limitations allow. A complete set of all airphotos and topographic maps listed here may be purchased for about $135.*

Illustrations

Figure 1 through 8 are airphotos selected from the list which accompanies this article. All figures are stereopairs and may be viewed stereoscopically with a folding pocket stereoscope. These airphotos are reproduced at a scale of about 1:20,000, the same as the

[3] The term abbreviated as "USGS" refers to the United States Geological Survey.

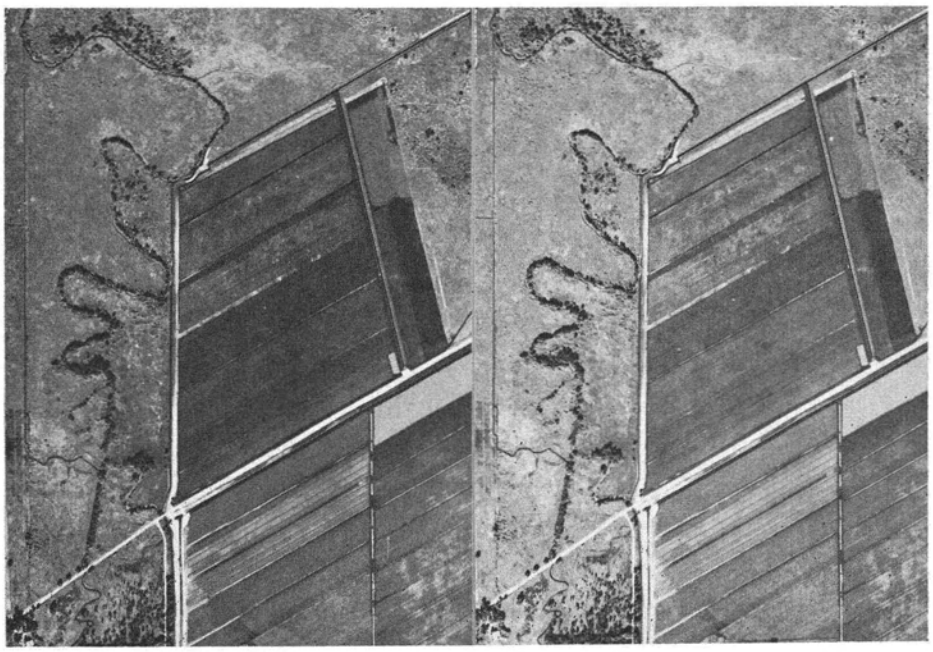

Fig. 2. Organic Deposit, Jefferson Co., Wis. (WV-4R-92-93).

FIG. 3. Esker, Oconto Co., Wis. (BIC-1V-37-38).

original ASCS contact prints. North is to the right in all figures.

Figure 1 illustrates a marginal moraine area in Walworth County, Wisconsin. It is a part of an interlobate kame moraine from the well-known "Kettle Moraine" area. The soils are very coarse-grained, consisting almost entirely of sand, gravel and cobble sized par-

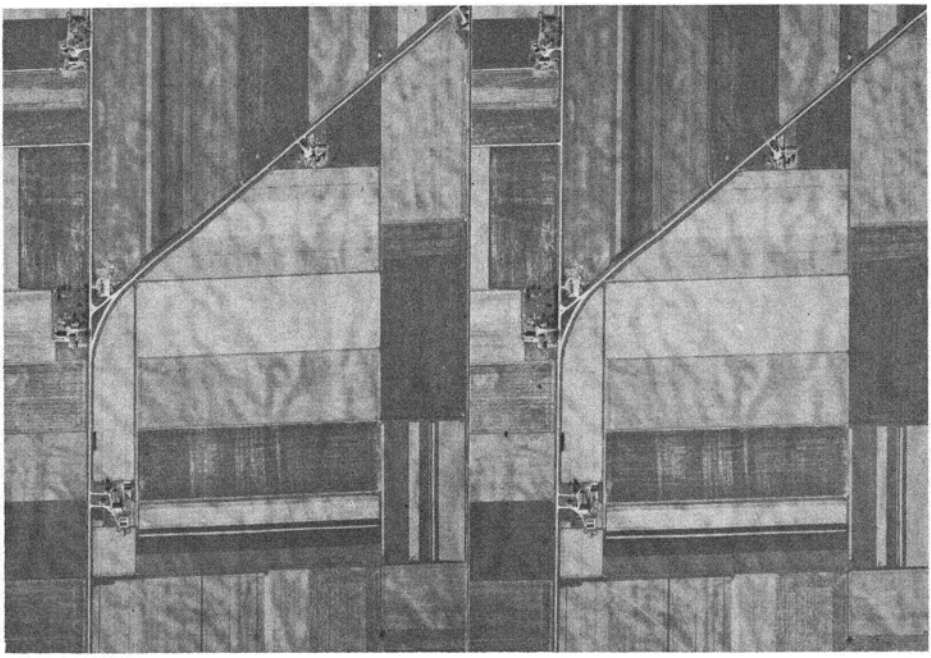

FIG. 4. Outwash Plain, Rock Co., Wis. (XA-2R-66-67).

FIG. 5. Sand Dune, Adams Co., Wis. (AJA-2T-177-178).

ticles with only a very small percentage of fines.

Figure 2 illustrates a deep deposit of muck and peat in Jefferson County, Wisconsin. There is a striking contrast between the air-photo pattern of the intensively farmed area (which has been drained) and the undrained marsh area with its natural vegetation.

Figure 3 shows an esker crossing an area of ground moraine in Oconto County, Wiscon-

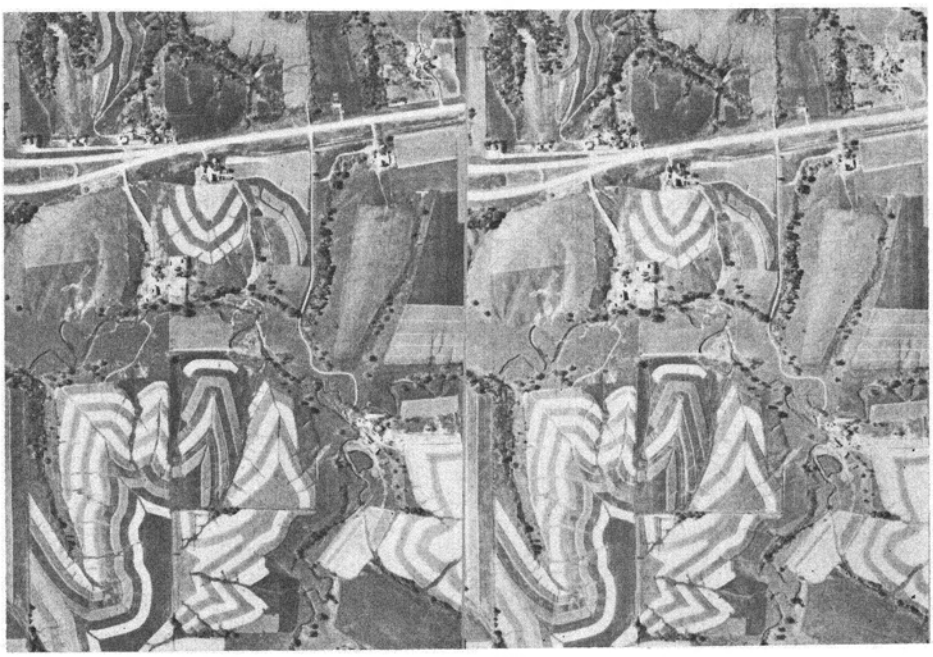

FIG. 6. Loess over Dolomite, Grant Co., Wis. (CI-4BB-192-193).

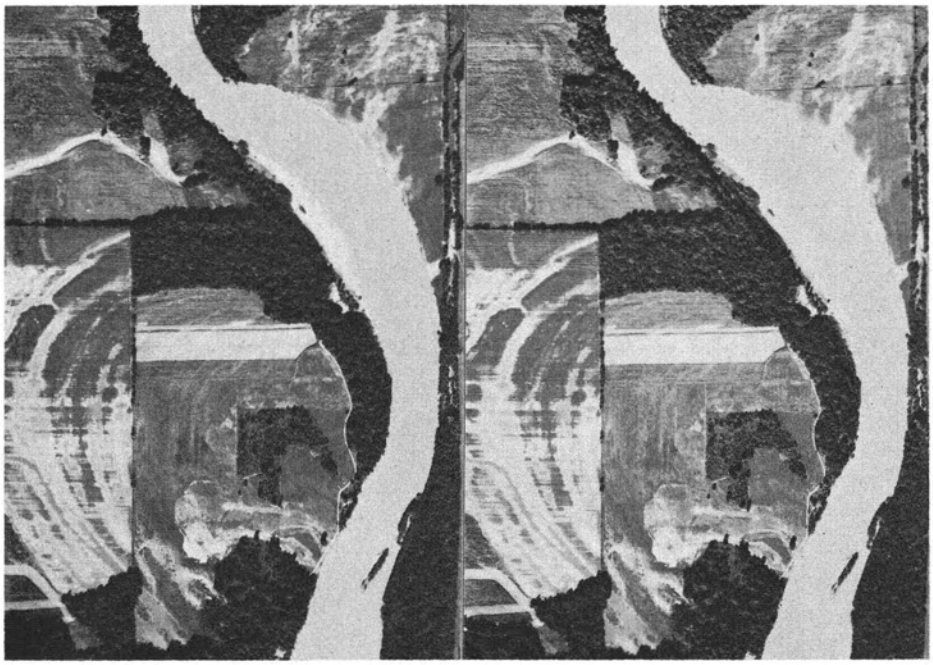

FIG. 7. Flood Plain, Knox Co., Ind. (QQ-1V-73-74).

sin. The esker can be distinguished from the ground moraine because its topography, drainage, erosion, photo tone, vegetation and land use are all different from those in the ground moraine area.

Figure 4 shows part of an outwash plain in Rock County, Wisconsin. The soils are stratified sands and gravels deposited by glacial melt water flowing east to west. Traces of the braided stream pattern of the proglacial

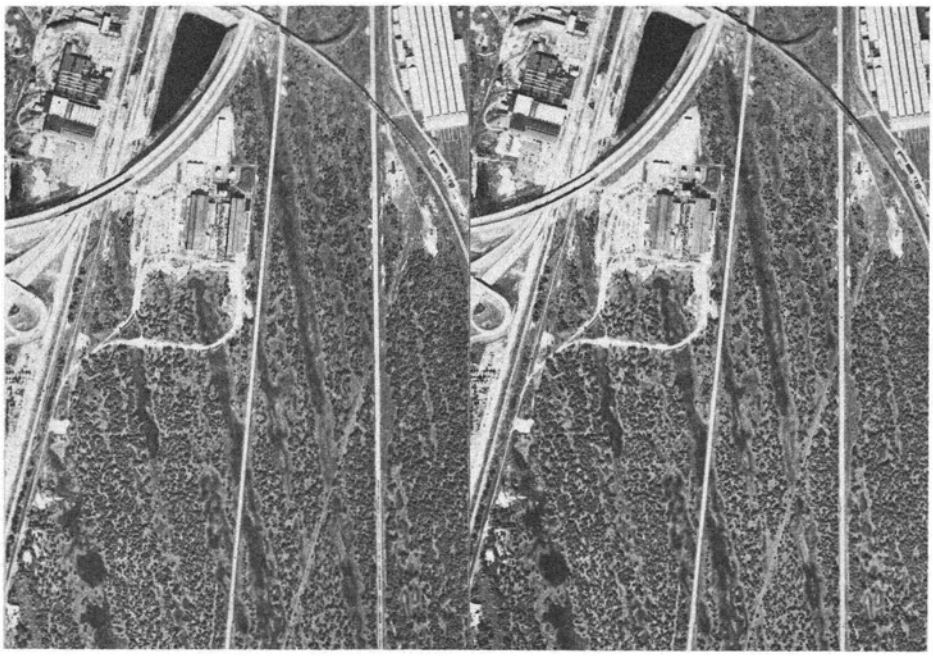

FIG. 8. Beach Ridges, Lake Co., Ind. (BFJ-1V-96-97).

streams that deposited this material 12,000 to 15,000 years ago can be readily seen.

Figure 5 shows an area of sand dunes located in a glacial lakebed area in Adams County, Wisconsin. These dunes are about 25 feet high and were formed by wind from the northwest.

Figure 6 shows an area of loess 8 to 16 feet thick over dolomite in Grant County, Wisconsin. The overall drainage pattern in the area is dendritic and is determined by the flat-lying dolomite bedrock. The fine textured gully system is caused by the loess cover.

Figure 7 shows a portion of the flood plain of the White River, which forms the boundary between Knox and Gibson Counties, Indiana. Point bar deposits from a former position of the meandering stream can be seen in the airphoto.

Figure 8 shows a series of beach ridges near Gary, Indiana. These were formed at or near the former shoreline of Lake Michigan. Many of the ridges near this location (but outside the area shown in the airphoto) have been reworked by the wind to form sand dunes.

How to Order ASCS Airphotos

Aerial photographs should normally be ordered on Form ASCS-441, "Order for Aerial Photographs." They may be ordered by letter if full information concerning State, County, Symbol, Roll Number, Exposure Number and print size is given.

For areas *east* of the Mississippi River, and including Minnesota and South Dakota, airphoto orders should be mailed to: Eastern Laboratory, Aerial Photography Division, ASCS-USDA, 45 South French Broad Ave., Asheville, N. C. 28801.

For areas *west* of the Mississippi River, orders should be mailed to: Western Laboratory, Aerial Photography Division, ASCS-USDA, 2505 Parley's Way, Salt Lake City, Utah 84109.

Current prices for 10 by 10-inch (9 by 9 inches when trimmed) contact prints at a scale of 1:20,000 (1 inch equals 1,667 feet) are as follows:

Number of Prints	*Price per Print*
1–5	$1.00
6–100	.90
Over 100	.70

Photo index sheets, 20 by 24 inches in size, cost $2.00 each. Payment must be made in advance on all orders. Orders are normally filled in about four weeks time.

How to Order USGS Topographic Maps

Topographic quadrangle maps should be ordered by name, date and series (7½ minute, 15 minute, or 1:250,000). The 7½ and 15 minute series maps cost 50 cents each. The 1:250,000-series maps cost 75 cents each. A discount of 20 percent is allowed on orders of $10 or more. Payment must be made in advance on all orders.

For areas *east* of the Mississippi River, topographic map orders should be mailed to: U. S. Geological Survey, Washington, D. C. 20242.

For areas *west* of the Mississippi River, including all of Minnesota, topographic map orders should be mailed to: U. S. Geological Survey, Federal Center, Denver, Colo. 80225.

University of Illinois Stereogram Series

A committee at the University of Illinois has collected a group of aerial photographs designed to illustrate the airphoto appearance of various landforms, soils, vegetation types and man-made features. These airphotos are available as "stereograms"—stereo-pair airphotos printed on 8-by-10-inch photographic paper. A written description of the area covered by each stereogram is available. These stereograms make an excellent supplement to the ASCS airphotos listed in this article. Several hundred of these stereograms are now available at a reasonable price (60 cents each for most stereograms with discounts given for quantity orders). A catalog and price list may be obtained from the following address: University of Illinois, Committee on Aerial Photography, 713 South Wright St., Champaign, Ill.

Summary

The list of airphotos which accompanies this article contains airphoto examples of geologic landforms of engineering significance located in 36 counties in the Eastern, Midwestern, and North Central United States. Teachers of geology, engineering, and airphoto interpretation may find this list of use in building their airphoto collection. A complete set of all airphotos and topographic maps listed here may be purchased for about $135 ($118 for the airphotos and $17 for the topographic maps). An additional amount of $88 will be required to purchase all photo index sheets listed. These photo index sheets will show additional airphotos that can be ordered to enlarge upon this basic list.

Landform	*County and State*	*Symbol, Roll, Exposure No.*	*Photo Date*	*Index Sheet No.*	*USGS Quadrangle Map Coverage*
AEOLIAN LANDFORMS					
LOESS—16–32 ft. thick; excellent example of pinnate drainage.	Buffalo, Nebr.	BMO—1T 124–125	May 1957	3	Alfalfa Center—1962 7½′—1:24,000
LOESS—32–64 ft. thick.	Sherman, Nebr.	BNO—2T 137–138	June 1957	1	Loup City—1953 7½′—1:24,000
LOESS—32–64 ft. thick.	Valley, Nebr.	BNQ—2T 51–52	May 1957	1	North Loup—1953 7½′—1:24,000
LOESS—8–16 ft. loess over dolomite.	Grant, Wis.	CI—4BB 192–195	Oct. 1961	5	Kieler—1961 7½′—1:24,000
SAND DUNES—Many houses on dunes up to 50 ft. high along Lake Mich. shore line.	Lake, Ind.	BFJ—1V 34–36	June 1958	1	Gary—1959 7½′—1:24,000
SAND DUNES—Up to 150 ft. high; along Lake Mich.	Porter, Ind.	BFP—2V 55–56	Sept. 1958	1	Portage—1960 7½′—1:24,000
SAND DUNES—Up to 150 ft. high; stabilized.	Box Butte, Nebr.	CAK—2AA 276–277	July 1960	3	Hemingford 4 S. W.—1948 7½′—1:24,000
SAND DUNES—Up to 200 ft. high; stabilized.	Sheriden, Nebr.	CBD—7N 5–8	August 1954	8	Spade Ranch—1950 15′—1:62,500
SAND DUNES—Approx. 25 ft. high; sandy glacial lake bed area.	Adams, Wis.	AJA—2T 177–178	July 1957	2	Adams—1961 15′—1:62,500
SAND DUNES—Approx. 75 ft. high; along Lake Mich.	Door, Wis.	BHQ—2AA 12–13	Sept. 1961	2	Jacksonport—1960 15′—1:62,500
FLUVIAL LANDFORMS					
FLOOD PLAIN—Many features due to meandering.	Knox, Ind.	QQ-1V 72–74	August 1958	3	East Mt. Carmel—1959 Patoka—1959 7½′—1:24,000
FLOOD PLAIN—Braided stream pattern of the Platte River.	Buffalo, Nebr.	BMO—2T 3–5	May 1957	4	Gibbon South—1962 7½′—1:24,000
FLOOD PLAIN—Braided stream pattern of the Wis. River; also old meander scars of Baraboo River.	Columbia, Wis.	WS—2CC 193–195	Sept. 1962	3	Briggsville—1958 15′—1:62,500
TERRACE—Along Ohio River.	Clark, Ind.	RI—1AA 24–26	June 1960	2	Bethlehem—1953 7½′—1:24,000
TERRACE—Several levels of stream & outwash terrace of the Wisconsin River.	Dane, Wis.	WU—2CC 8–12	June 1962	3	Mazomanie—1962 7½′—1:24,000
GLACIAL LANDFORMS					
DRUMLINS—Up to 125 ft. high.	Wayne, N. Y.	ARO—1N 78–80	July 1954	3	Savannah—1954 7½′—1:24,000
DRUMLINS—40–80 ft. high; surrounded by marsh and lake.	Dodge, Wis.	AX—5R 88–92	June 1956	4	Horicon—1955 15′—1:62,500
DRUMLINS—40–60 ft. high.	Jefferson, Wis.	WV—4R 124–126	July 1957	1	Watertown—1959 15′—1:62,500
MARGINAL MORAINE—Hummocky terrain; striking tonal contrasts; many lakes & ponds.	Clay, Minn.	BXR—4V 63–64	Nov. 1958	4	Fargo—1953 1:250,000
MARGINAL MORAINE—Valley Moraine in deep glacial valley.	Tompkins, N. Y.	ARU-3N 70–71	Oct. 1954	1	West Danby—1950 7½′—1:24.000
MARGINAL MORAINE—Recessional moraine; marshes and ponds.	Dane, Wis.	WU—3CC 197–199	Sept. 1962	5	Rutland—1961 7½′—1:24,000
MARGINAL MORAINE—Recessional moraine; 40 ft. relief; fine-grained soils.	Kenosha, Wis.	XD—1DD 136–139	June 1963	1	Pleasant Prairie—1958 7½′—1:24,000
MARGINAL MORAINE Terminal moraine; 40—80 ft. relief; coarse-grained soils	Rock. Wis,	XA—2R 63–65	May 1956	1	Avalon—1961 7½—1: 24, 000

Landform	*County and State*	*Symbol, Roll, Exposure No.*	*Photo Date*	*Index Sheet No.*	*USGS Quadrangle Map Coverage*
GLACIAL LANDFORMS (*Continued*)					
MARGINAL MORAINE—Interlobate kame moraine; 150 ft. relief; very coarse-grained soils.	Walworth, Wis.	XB—3R 98—100	Oct. 1956	1	Whitewater—1960 7½′—1:24,000
TILL PLAIN—Sag and swell topography; fine-grained soils	Madison, Ind.	BWI—1BB 27–30	May 1961	1	Gaston—1960 7½′—1:24,000
TILL PLAIN—Sag and swell topography; fine-grained soils.	Tipton, Inc.	BWM—4R 133–136	Sept. 1956	1	Kempton—1960 7½′—1:24,000
GLACIO-FLUVIAL LANDFORMS					
ESKER—Fifteen miles long; 20–40 ft. high.	Oconto, Wis.	BIC—1V 37–38	May 1958	2	Oconto—1956 15′—1:62,500
ESKER—100 ft. high; surrounded by water (man-made lake).	Walworth, Wis.	XV—3R 97–98	Oct. 1956	1	Whitewater—1960 7½′—1:24,000
ESKER & KAME—Located in valley in area of shale hills.	Tioga, N. Y.	ASM—1P 157–158	June 1955	1 1	Marathon—1950 Lisle—1949 7½′—1:24,000
ESKER & KAME—Interlobate kame moraine area.	Walworth, Wis.	XB—3R 43–44	Oct. 1956	1	Little Prairie—1960 7½′—1:24,000
KAME—Kames and kame terrace in area of shale hills.	Cortland, N. Y.	ASK—1P 48–50	May 1955	1	Cortland—1955 7½′—1:24,000
OUTWASH—Valley train between shale hills.	Cortland. N. Y.	ASK—1P 86–88	May 1955	1	Homer—1955 7½′—1:24,000
OUTWASH—Valley train between shale hills.	Tompkins, N. Y.	ARU—3N 184–186	Oct. 1954	1	Speedsville—1949 Willseyville—1949 7½′—1:24,000
OUTWASH—Located between marginal moraine and glacial lakebed deposits.	Adams, Wis.	AJA—1T 135–136	June 1957	3	Briggsville—1958 15′—1:62,500
OUTWASH—Outwash plain; fan-type deposit; fossil distributary channels clearly shown.	Rock, Wis.	XA—1R 100–102	May 1956	1	Janesville East—1961 7½′—1:24,000
OUTWASH—Outwash plain; 12 ft. per mile slope; adjacent to terminal moraine.	Rock, Wis.	XA—2R 65–67	May 1956	1	Avalon—1961 7½′—1:24,000
GLACIO-LACUSTRINE LANDFORMS					
BEACH RIDGE—Series of ridges near Lake Mich.	Lake, Ind.	BFJ—1V 96–97	June 1958	1	Gary—1959 7½′—1:24,000
BEACH RIDGE—Former shoreline of Lake Ontario.	Niagara, N. Y.	ARE—2V 108–109	August 1958	1	Tonawanda—1948 15′—1:62,500
BEACH RIDGE—Shoreline of glacial Lake Agassiz.	Grand Forks N. D.	ZZ—3CC 71–74	July 1962	2	Emerado—1960 15′—1:62,500
BEACH RIDGE—Series of ridges near Lake Michigan.	Door, Wis.	BHQ—3AA 244–245	Sept. 1961	3	Sister Bay—1960 15′—1:62,500
BEACH RIDGE—Series of ridges near Lake Michigan.	Manitowoc, Wis.	BHY—2AA 145–147	Oct. 1961	1	Manitowoc—1954 15′—1:62,500
LAKEBED—Lakebed of glacial Lake Agassiz; striking linear tone pattern.	Clay, Minn.	BXR—1V 121–124	July 1958	2	Grand Forks—1952 1:250,000
LAKEBED—Meandering stream crossing lakebed of glacial Lake Agassiz.	Clay, Minn.	BXR—4V 3–5	Nov. 1958	3	Fargo South—1959 7½′—1:24,000
LAKEBED—Lakebed of glacial Lake Agassiz.	Grand Forks N. D.	ZZ—2CC 239–240	June 1962	5	Grand Forks—1934 15′—1:62,500
LAKEBED—Near Lake Michigan; traces of shoreline deposits are present.	Racine, Wis.	XC—1DD 41–42	June 1963	1	Racine South—1958 7½′—1:24,000

Landform	*County and State*	*Symbol, Roll, Exposure No.*	*Photo Date*	*Index Sheet No.*	*USGS Quadrangle Map Coverage*
ORGANIC SOILS					
MARSH—Deep deposits of muck and peat.	Dane, Wis.	WU—3CC 191–193	Sept. 1962	5	Madison East—1959 7½′—1:24,000
MARSH—Drumlins rise from this marsh like islands from a lake.	Dodge, Wis.	AX—6R 204–206	July 1956	1	Beaver Dam—1955 15′—1:62,500
MARSH—Deep deposits of muck and peat; part of area is drained and intensively farmed.	Jefferson, Wis.	WV—4R 91–93	July 1957	1	Palmyra—1960 Rome—1960 7½′—1:24,000
MARSH—Deep deposits of muck and peat; part of area is drained and intensively farmed.	Waukesha, Wis.	WW—2R 166–168	July 1956	1	Oconomowoc West—1959 Palmyra—1960 7½′—1:24,000
BEDROCK LANDFORMS					
DIABASE—Ring-and-plug form diabase ridges.	Hunterdon, N. J.	CMY—3R 55–57	Oct. 1956	1	Flemington—1954 7½′—1:24,000
DOLOMITE—Flat-lying beds; flat topped hills.	Iowa, Wis.	WT—4CC 136–139	August 1962	2	Montfort—1952 7½′—1:24,000
LIMESTONE—Flat-lying beds; extensive sinkhole development.	Hardin, Ky.	ALN—7V 35–37	Jan. 1959	1	Flaherty—1960 Vine Grove—1960 7½′—1:24,000
SANDSTONE—Sandstone ridge in limestone area.	Hardin, Ky.	ALN—4V 137–139	Oct. 1958	1	Flaherty—1960 7½′—1:24,000
SANDSTONE—Flat-lying beds; flat topped hills.	Juneau, Wis.	BHT—4T 109–110	July 1957	3	Kendall—1962 Mauston—1962 15′—1:62,500
SHALE—Flat-lying beds; dendritic drainage pattern.	Hunterdon, N. J.	CMY—2R 15–17	August 1956	1	Frenchtown—1955 7½′—1:24,000
SHALE—Tilted beds; striking drainage pattern.	Hunterdon, N. J.	CMY—2R 101–103	August 1956	1	Pittstown—1955 7½′—1:24,000

Tokyo Symposium

(Commission V, Special Applications of Photogrammetry, of the International Society of Photogrammetry is under the guidance of the Japan Society of Photogrammetry during this quadriennium. As a part of the Commission's function, a symposium in this field was conducted in Tokyo from October 12 to 17, 1966. *Prof. H. M. Karara* of the University of Illinois presented a paper at the symposium, represented the American Society of Photogrammetry at the meeting, and upon his return submitted a comprehensive report to *ASP President L. W. Swanson*. The following material is excerpted from that report.—*Editor*)

THIS HIGHLY SUCCESSFUL symposium was held in Toshi Center Hall in Tokyo under the most able direction of *Prof. T. Maruyasu*, President of ISP Commission V, and Mr. T. Oshima, Secretary-General of the Japan Society of Photogrammetry. A total of 277 participants from 34 countries attended the meeting. The Japanese delegation consisted of 227 persons, where the other delegations ranged from 1 to 4 persons.

Eighteen papers were presented and thoroughly discussed. The official languages of the Symposium were English, French, German, and Japanese. Simultaneous translations in English and Japanese were performed admirably by professional translators without serious difficulties. All the 18 papers presented are expected to be published in Japanese and English in the Journal of the Japan Society of Photogrammetry in the near future. The authors and titles of the papers are listed below.

W. Blaschke (Germany), "Problems of the Practical Application of Photogrammetry to Highway Design and Construction."

H. Kasper (Switzerland), "Photogrammetry and the Digital Terrain Model" (read by *K. Linkwitz*).

(*Continued on page 210*)