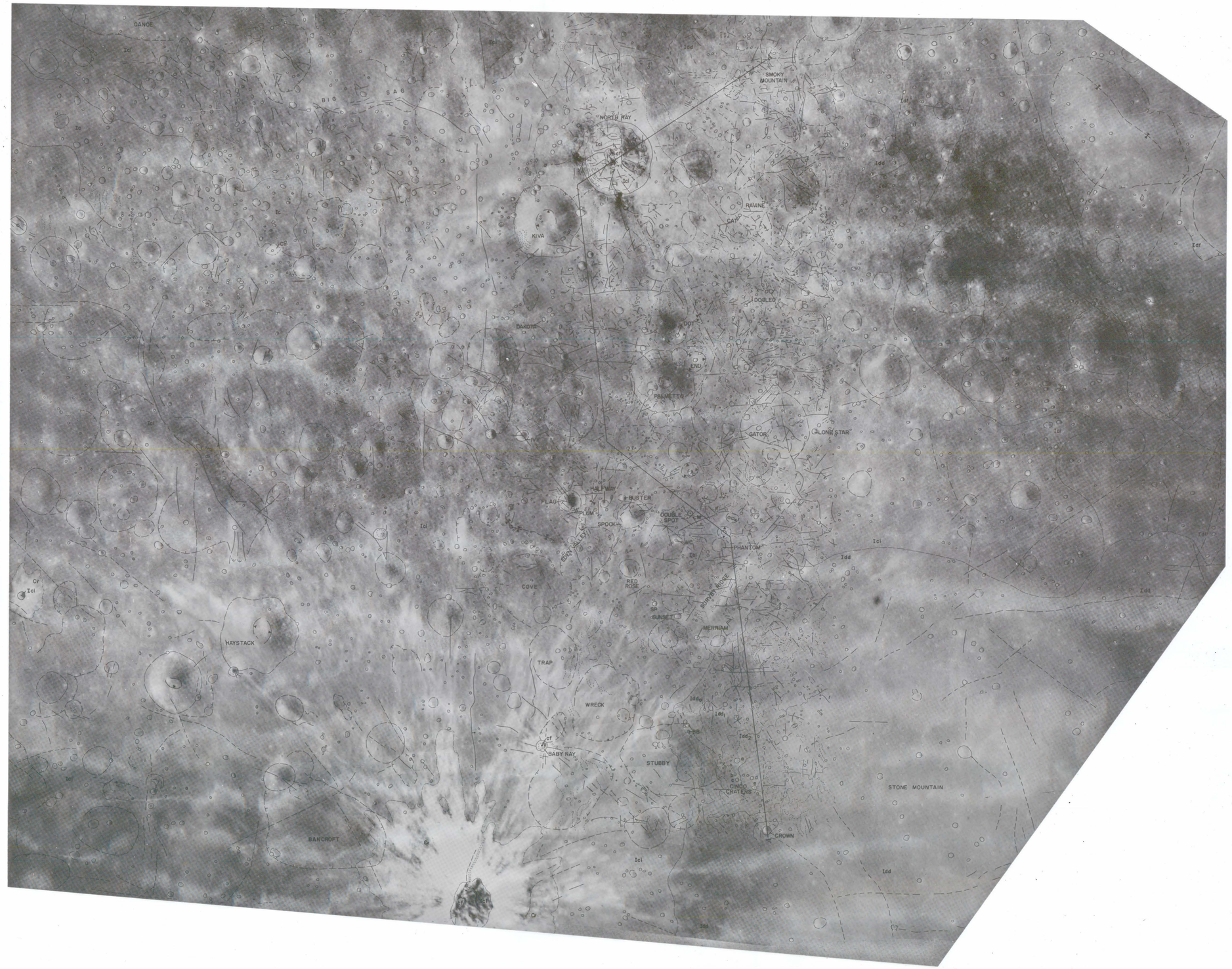
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE
MANNED SPACECRAFT CENTER
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
UNDER NASA CONTRACT NO. T-5874A

DESCARTES LANDING SITE AREA

APOLLO 16



Base from uncontrolled rectified photomosaic, using Apollo 14 photographs (500 mm), prepared by G. Nakata, U. S. Geological Survey, Flagstaff, Arizona. Topographic control for geologic section from 1:12,500 scale topographic map by U. S. Army Topographic Command, Washington, D. C.

APPROXIMATE SCALE 1:25,000

1 0 1 2 3 MILES

1 0 1 2 3 KILOMETERS

N

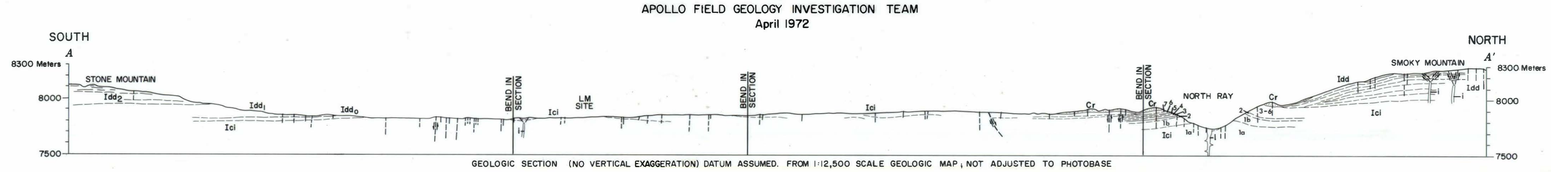
Geology by D. P. Elston, E. L. Boudette, J. P. Schafer, and G. R. Scott, 1971-72, using stereographic analytic plotter and second-generation film positives of Apollo 14 photographs 69-9520 and 69-9522 (500 mm).

GEOLOGIC MAP OF THE APOLLO 16 (DESCARTES) LANDING SITE AREA

By

APOLLO FIELD GEOLOGY INVESTIGATION TEAM

April 1972



GEOLOGIC SECTION (NO VERTICAL EXAGGERATION) DATUM ASSUMED. FROM 1:12,500 SCALE GEOLOGIC MAP, NOT ADJUSTED TO PHOTOBASE

GEOLOGIC MAP OF THE APOLLO 16 (DESCARTES) LANDING SITE AREA

BY

D.P.Elston, E.L.Boudette, and J.P. Schafer

April 1972

EXPLANATION

RIM AND FLOOR MATERIALS OF RAYED OR BRIGHT-HALO (IMPACT) CRATER

Cr: Irregular, blocky to locally smooth deposits enclosing rimmed craters of probable impact origin. Mostly high to high-intermediate albedo; locally low-intermediate albedo in western part of North Ray Crater rim deposit; dark streak in north rim of South Ray Crater may be derived from a thin dark layer in crater wall. Subdued subparallel lineations occur in western and southern parts of rim deposit of North Ray Crater, and are inferred to be bedrock strata deposited in inverted stratigraphic order in an overturned flap of ejecta.

cf: crater floor material. Smooth intermediate-albedo material bounding hillocks and ridges in North Ray Crater; rough, hilly intermediate- and high-albedo material in South Ray Crater; smooth, dark, mare-like material in Baby Ray Crater.

[With the exception of Flag and Spook Craters, rim materials of older rimmed craters not mapped (Imbrian, Eratosthenian, and early Copernican); relative ages of these older craters may be broadly inferred from classification of rim crests.]

COPERNICAN

CAYLEY FORMATION

Stratified materials, with layers about 10-40 m thick. Divided into an irregular unit (Ici) forming a rolling irregular surface, and a smoother unit (Ic) forming a more gently undulating surface. Interpreted to be mafic to intermediate volcanics with minor intrusives (i).

A dark, near-vertical dike-like band (mapped as unit i) occurs in south wall of North Ray Crater, and may hold up ridge line to south. Possibly equivalent, discontinuous dark bodies occur in and near the crater floor. Dark, rubbly-appearing material (dr) on east wall may be derived from an intrusive, or dr may include intrusive material essentially in place.

Seven possible stratification units of intermediate to high albedo occur in the southwest wall of North Ray Crater. A lower light-hued layer (unit 1 in geologic section) is relatively thick and appears to trace into the east wall without appreciable offset. A thin uppermost layer (unit 7 in geologic section) is especially bright. Albedo correlation and thickness are the bases for inferring that much of the upper part of the section in North Ray Crater is repeated in inverted order in the western rim deposit.

Three stratification units occur in South Ray Crater where two relatively thick units of high albedo are separated by a thin north-dipping dark unit. About 30 m of a high albedo unit is exposed in Baby Ray Crater, and may correlate with the upper light-hued unit in South Ray Crater

MATERIALS OF THE DESCARTES MOUNTAINS

Stratified, with layers about 10-40 m thick; form both domical mountains (Idd) and hilly, furrowed uplands (Idf). Descartes materials on Stone Mountain are subdivided into a relatively thin, light-medium-gray, lowermost unit (Idd_0), which is morphoolgically transitional into materials of the underlying Cayley formation (Ici); a light-medium-gray, relatively smooth, intermediate unit (Idd_1); and a dark-medium-gray, rougher appearing upper unit (Idd_2). Each of these units probably consists of several layers. Unit Idf forms a surface of moderate relief, marked by prominent northwest-trending furrows. East of Stone Mountain and on the east side of Smoky Mountain, Idf appears to overlap Idd. Idd and Idf are interpreted to be intermediate to mafic volcanics with minor intrusives (i)

IMBRIAN

Morphologic boundary between major map units, interpreted to be contact between major lithologic units. Within map units, marks contact between principal stratification units. Dashed where approximately located; dotted where concealed; queried where uncertain

Filigree: smooth to finely irregular, commonly crenulated, linear features of low differential relief, or narrow lines marking albedo changes. Occur singly and in sets on very low to steep slopes. Many probably reflect internal stratification underlying the regolith. On steep slopes, such as in Stubby Crater, may be mainly the product of colluvial movement

Inferred fault
Relative movement shown by arrows
(Geologic section only)

Inferred collapse structure
(Geologic section only)

Outline of rimless or low-rimmed depression or trough
Interpreted to be collapse structure, possibly relict volcanic vent; inferred to be locally underlain by associated intrusives (unit i, shown in geologic section only)

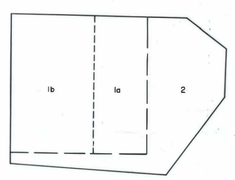
Structural lineament
Interpreted to be mainly fractures. Where scarp is present, interpreted to be a fault; bar and ball on apparent downthrown side. Offsets of lineaments at places suggest strike-slip displacements

Sharp | Degraded | Indistinct
Outline of rim crest of distinctly to perceptibly rimmed (impact) crater. Smallest craters all shown by solid lines, though most are degraded

Crease, or axis of broad trough

Mound

Nominal LM site



1. Area of mapping from 500 mm stereophotographs AS-14-69-9520 and-9522.
   a. Detailed mapping 1:12,500 scale.
   b. Reconnaissance mapping 1:12,500 and 1:25,000 scales.
2. Area of 1:25,000 scale reconnaissance mapping, from 80 mm stereophotographs and rectified photomosaic base.