Craters are secondary craters formed by impact of

ejecta from Orientale basin. Fan material is ejecta

from these craters best developed immediately

"downstream" from clusters on plains. May in-

clude some fine debris from Orientale basin

pIcr₃, rim material, hummocky. Forms subdued raised rim; rim crest generally rounded

and finely crenulated but has some relatively sharp parts; commonly interrupted by

relatively large craters; broadly hummocky and marked by terrace remnants in large

 $pIcw_3$, wall material. Forms moderately steep walls and subdued, broadly hummocky terraces. Marked by radial channels, poorly developed in craters >45 km and well

pIcf₃, floor material. Forms low hills, ridges, broad hummocks; appears to be finely

Mostly materials of impact craters like those of younger craters; Schiller possibly of

pIcr₂, rim material, hummocky. Forms highly cratered, commonly incomplete raised rim

pIcw2, wall material. Forms hummocky, irregular slopes on which terrace remnants

Crater materials

pIct,, rim material, hummocky. Forms narrow poorly mappable, low rampart around

pIcw₁, wall material. Forms moderate to gentle slopes in Longomontanus; interrupted

pIcf₁, floor material. Exposed only in Longomontanus and crater west of Weigel B;

pIcp₁, peak material. Mapped only in Longomontanus; smoother than unit pIcp₃

by broad hummocks and irregular terrace remnants; fairly heavily cratered. Mapped

only poorly defined; radial channels developed to a maximum

crater Schiller S; rim crest discontinuous and wholly subdued

granular at 100 m resolution $pIcp_3$, peak material. Forms elongate ranges as long as 25 km and individual hills in

craters (>45 km), more finely and irregularly hummocky in smaller craters

floors of craters Schiller, Bettinus, and Blancanus; has smooth steep slopes

Mostly materials of impact craters like those of Zuchius; craters

pIc₃, crater materials, undivided

pIco, crater materials, undivided

Materials of impact craters

pIc, crater materials, undivided

as buried in other craters

Material of impact craters

having very subdued rim crest

pIcf₂, floor material. Similar to unit pIcf₃

Scheiner B, Rost B, and possibly other craters may be volcanic

_____ Contact Long dashed where approximately located; short dashed between gradational facies of the same formation

Concealed contact

Shows limit of topographically expressed part of buried

unit indicated by symbol in parentheses

Solid line at base of sharp scarp; dashed where in-

ied. Bar and ball on apparent downthrown side

Lineament

Linear depression. Interpretation: Faults, buried

Scarp Line marks foot of scarp in plains unit. Barb points

downslope. Interpretation: Fault scarp

Slump mass

Line outlines material which appears to have moved

.

Schiller basin outline

ments of basin-ring structures

Buried crater rim crest

ally expressed wall and rim of craters buried by

Indicates approximate contact between topographic-

Line marks approximate crest line of preserved seg-

downslope as a single mass. Arrow shows direction

be depositional in origin

of movement

regional units

or exposed, except in unit Ifo where lineaments may

ferred and exposed: dotted where inferred and bur-

lagstaff, Arizona. Mapped 1967–68.

INDEX MAP OF THE EARTHSIDE HEMISPHERE OF THE MOON

Number above quadrangle name refers to lunar base chart (LAC series);

number below refers to published geologic map

SCALE 1:1 000 000

STANDARD PARALLELS 21°20' AND 42°40'

GEOLOGIC MAP OF THE SCHILLER QUADRANGLE OF THE MOON

LUNAR ORBITER PHOTOGRAPHIC COVERAGE OF SCHILLER QUADRANGLE

All numbers refer to high-resolution frames of Orbiter IV

Prepared on behalf of the National Aeronautics and Space Administration under

this chart is interpreted from photographs taken at Lowell,

McDonald, Mount Wilson, Yerkes, Pic du Midi and Kot-

tomia Observatories. Supplementary visual observations

with the 20 and 24 inch refracting telescopes at Lowell

Observatory provide identification and clarification of

indistinct photographic imagery and the addition of

minute details not recorded photographically. The

pictorial portrayal of relief forms is developed using an

assumed light source from the West with the angle of Illumination maintained equal to the angle of slope of the

For sale by U.S. Geological Survey, price \$1.00

STRUCTURE

figure shows the azimuth frequency distribution of lineaments. The two major

Low hummocky ridges and intervening valleys in the large clusters of Orientale

satellitic materials which occur in the Schiller plains area are also mapped as

neaments. These may be structural in origin but are more likely depositional.

'hey probably formed by outward spray of ejecta in a herringbone pattern from

a linear focus of impacting material. Similar patterns are very clear in satellitic

AZIMUTH-FREQUENCY DISTRIBUTION OF LINEAMENTS

GEOLOGIC HISTORY

The earliest decipherable event in the area was the formation of the Schiller

basin. Aside from formation of major craters such as Longomontanus, Clavius,

and Schiller, and possible faulting associated with the Humorum basin-forming

event, no major geologic event is recorded until Imbrian time, when widespread

mantling of the terra took place (unit It). In late Imbrian time much faulting,

cratering, and deposition of ejecta occurred as a result of the event which formed

the Orientale basin. This event was followed by the emplacement of smooth plains materials which fill most older craters, the Schiller basin, and many low

areas in the terra. The last major event was the emplacement of dark material as a surficial covering in the Schiller plains area. Formation of the crater Zuchius

in late Copernican time resulted in widespread distribution of fresh ejecta across

the southwest corner of the quadrangle. Still more recently, dark material was

surfaces are probably areas where materials have been recently exposed; they are

REFERENCES

Carr, M. H., 1966, The geology of the Mare Serenitatis region of the Moon, in

Hartmann, W. K., and Kuiper, G. P., 1962, Concentric structures surrounding lunar

Hartmann, W. K., and Yale, F. G., 1968, Lunar crater counts, IV-Mare Orientale

and its basin system: Arizona Univ. Lunar and Planetary Lab. Commun., v. 7,

Howard, K. A., and Masursky, Harold, 1968, Geologic map of the Ptolemaeus

McCauley, J. F., 1967a, The nature of the lunar surface as determined by syste-

McCauley, J. F., 1967b, Geologic map of the Hevelius region of the Moon: U.S.

_____1968, Geologic results from the lunar precursor probes: Am. Inst. Astro-

Milton, D. J., 1968, Structural geology of the Henbury meteorite craters, Northern

determination of lunar geologic units, in Geological Survey research 1970: U.S.

Shoemaker, E. M., and Hackman, R. J., 1962, Stratigraphic basis for a lunar time scale, in Kopal, Zdenek, and Mikhailov, Z. K., eds., The Moon—Internat. Astron.

Union Symposium 14, Leningrad, 1960, Proc.: London, Academic Press, p. 289-300.

Wilhelms, D. E., 1968, Geologic map of the Mare Vaporum quadrangle of the Moon:

Wilhelms, D. E., 1970, Summary of lunar stratigraphy—telescopic observations: U.S. Geol. Survey Prof. Paper 599-F, p. F1-F47.

Geol. Survey Prof. Paper 700-C, p. C153-C169; also 1969, U.S. Geol. Survey open

Territory, Australia: U.S. Geol. Survey Prof. Paper 599-C, p. C1-C17. Pohn, H. A., and Offield, T. W., 1970, Lunar crater morphology and relative age

matic geologic mapping, in Runcorn, S. K., ed., Mantles of the earth and ter-

quadrangle of the Moon: U.S. Geol. Survey Map I-566.

restrial planets: London, John Wiley & Sons, p. 431-460.

nautics and Aeronautics Jour., v. 6, no. 10, p. 1991-1996.

basins: Arizona Univ. Lunar and Planetary Lab. Commun., v. 1, no. 12, p. 51-66.

Astrogeologic Studies Ann. Prog. Rep., July 1, 1965-July 1, 1966, pt. A:U.S. Geol.

Impact cratering and mass wasting have occurred throughout the history of the quadrangle, covering many surfaces with debris and exposing others. Bright

systems are apparent.

materials around large fresh impact craters.

emplaced in three small areas (unit Cd).

Survey open-file report, p. 11-16.

Geol. Survey Map I-491.

U.S. Geol. Survey Map I-548.

mapped as unit Cs.

where indistinct small craters are numerous and

around some pre-Imbrian crater rims. On oldest

pre-Imbrian craters, obscures rims and apparently

present on walls and floors. On some younger, less

subdued pre-Imbrian craters, incompletely cover

rims, and apparently present patches incompletely

covered by younger plains material (unit Ip) is

floors; absent or inconspicuous on walls. On east

side of crater Schiller, has fine-scale structure radial

Deposited by ash flows and ash falls over low-lying terra. Some in isolated topographic lows may be accumulated colluvial debris from adjacent slopes. Sufficiently thick in places to subdue low degraded rims of large craters; sufficiently thin in places to leave small subjacent craters partly exposed. Age probably varies from place to place; may be as

young as early late Imbrian

Terra material, undivided

Forms topographically rugged terrain, principally between craters

Zuchius and Scheiner; also makes up discontinuous ring outlines of

Schiller basin. Ridges generally round-crested; slopes apparently

subdued by mantling material, but relief greater than on terra-mantling

material and elsewhere in terra. Albedo intermediate to moderately

Oldest material exposed in quadrangle; mostly ancient crustal rocks

broken and jumbled by formation of Schiller basin; some probably crater

unmapped cover of terra-mantling material

*Albedo described qualitatively because mapped area

ments do not permit better definition. Nearer center

of disk, units like map units Cs and Cd have typical

normal albedos of 0.16 and 0.08, respectively; this is

Schiller quadrangle.

approximate maximum range of albedo values in

is in limb region of Moon where existing measure-

material too old to be distinguishable. Smoother slopes may have thin

pIc, crater materials undivided. Materials of craters with markedly

pIcw, wall material. Occurs in subdued craters for which no more

specific assignment can be made; has general range of characteristics

to completely subdued rims; too small for subdivision of units

of wall material assigned specific ages within pre-Imbrian

GEOLOGIC ATLAS OF THE MOON

I-691 (LAC 125)

SCHILLER QUADRANGLE

GEOLOGIC SETTING

STRATIGRAPHY