**Hermit Shale** (in Aubrey Group)[1]

Hermit Formation

Permian: Northern Arizona, southeastern Nevada, and southern Utah.

*Original reference:* L. F. Noble, 1922, U.S. Geol. Survey Prof. Paper 131–B, p. 26, 28, 64.

E. D. Koons, 1945, Geol. Soc. America Bull., v. 56, no. 2, p. 154. Discussion of geology of Uinkaret Plateau. Hermit formation, 1,053 feet thick, overlies Supai formation and underlies Coconino sandstone. Lower 200 feet contains cross-laminated beds of sandstone; upper 800 feet composed of weak shales and sandstones.

A. H. McNair, 1951, Am. Assoc. Petroleum Geologists Bull., v. 35, no. 3, p. 515 (fig. 2), 526, 527–528. Referred to as formation. Designation shale is misnomer. Noble in description of type section used term sandstone for compact massive beds and shale for thinly laminated soft beds which are in reality fine-grained sandstones. Thickness: 933 feet at South Hurricane Cliffs; 700 feet at North Grand Wash Cliffs. Underlies Coconino sandstone; overlies Queantoweap sandstone (new) with contact transitional in interval ranging from 5 to 50 feet. If unconformity at base of

Hermit at Bass Trail and at Jumpup Canyon on Kanab Creek, described by Noble (1922, and 1928, U.S. Geol. Survey Prof. Paper 150), is present in sections west of Kanab Creek, it would occur between the Queantoweap and Hermit; it may have been overlooked in present work.

Type locality: Hermit Basin, Arizona.

**Hermit shale.** (Of Aubrey group.)

Permian: Northern Arizona, southern Utah, and southeastern Nevada.

L. F. Noble, 1922 (U. S. G. S. P. P. 131B, pp. 26, 28, 64+). *Hermit sh.*—Deep brick-red sandy shales and fine-grained friable sss., 267 to 317 ft. thick at Hermit Basin, the type loc. Uncon. overlie Supai fm. as herein redefined, but formerly included in Supai fm. under the designations "sh. of Supai fm." and "upper Supai sh." The beds are separated from Supai fm. because of uncon. at their base and fact that they contain plants and other fossils of Perm. age; the underlying Supai fm. *as here redefined being considered of* Penn. age, but possibly of Perm. age in its upper part. Lithologically the Hermit sh. resembles many beds of sandy sh. in the Supai, but, unlike the Supai, it contains no massive hard layers of cross-bedded ss., and the more sandy beds in the Hermit are prevailingly reddish, not buff, as they are in the Supai. Thin platy lamination is most prominent structural characteristic of Hermit sh. Thickness varies from possibly less than 75 ft. in region about Tanner Canyon to 500+ft. W. of Bass Canyon. Underlies Coconino ss.

Hermit Sh. 1961

Baars, D. L., Permian System of the Colorado Plateau (abs.): in New Mexico Geol. Soc. Guidebook 12th Field Conf., p. 196



Permian

Colo. Plateau
Colo. Utah

Hermit Sh. 1961

Maxson, J. H., Geologic history of the Bright Angel quadrangle: Grand Canyon Natural History Assoc. col. 1, 3

Permian Arizona

Hermit Sh.

1962

*Twenter, F. R., Geology and promising areas for ground-water development in the Hualapai Indian Reservation, Arizona: USGS Water Supply Paper 1576-A

p. A-14

Aubrey Gp.
Penn.

NW Arizona

Hermit Sh. 1962

Wilson, E. D., A résumé of the geology of Arizona: Ariz. Bur. Mines Bull. 171
Comprehensive bibliography keyed to discussion
Precambrian correl. chart p. 8 402(274)
Ar4

p. 22, 32, 33

Penn. & Permian Arizona

Hermit sh. 1961

*Tschanz, C. M., and Pampeyan, E. H., Preliminary geologic map of Lincoln County, Nevada: USGS Min. Inv. Field Studies Map, MF-206
sheet 2

Lower Permian Nevada

Hermit Sh. 1962

Baars, D. L., Permian System of Colorado Plateau:
AAPG Bull., v. 46, no. 2
p. 154, 211, 213

fig. 2, 13-14

Overlies Supai Fm.

Permian

Colorado Plateau
Ariz.

Hermit Fm. 1962

Fisher, W. L., and Sorauf, J. E., Correlation chart of the Permian formations of North America: Discussion of the Grand Canyon section: GSA Bull., v. 73, no. 5 p. 649-51, fig. 1

G(200)
G 29

Relationships in variance to Dunbar, et al (1960)

Leonardian
Permian

N Arizona

Hermit Fm. 1962

Kottlowski, F. E., Pennsylvanian rocks of Southwestern New Mexico and Southeastern Arizona, in Pennsylvanian System in the United States, Symposium: AAPG 336(200)
p. 342-44, nomenclature chart-p. 361 Am3p

Wolfcamp-Leonard
Permian

SW New Mexico
SE Arizona

Hermit Fm. 1962

Bissell, H. J., Permian rocks of parts of Nevada, Utah, and Idaho: GSA Bull., v. 73, no. 9, p. 1083-1110. G(200) G29
A reconnaissance with suggestions for revision of nomenclature.

p. 1102

Permian

eastern Great Basin: E. Nevada, W. Utah, and central to s-central Idaho

Hermit 1962

Bissell, H. J., Pennsylvanian and Permian rocks of Cordilleran area, in Pennsylvanian System in the United States, Symposium: AAPG 336(200)
Correl. Chart & Sections-new name Am3p

Wolfcampian
Permian

Cordilleran area
Western U. S.

Hermit Sh. 1963

Brill, Kenneth G., Jr., Permo-Pennsylvanian stratigraphy of western Colorado Plateau and eastern Great Basin regions: GSA Bull., v. 74, no. 3. G(200) G29

p. 307, Fig. 14, p. 323

Leonardian(?) Permian

Utah, Nevada Arizona

Hermit Sh. 1963

Sorauf, J. E., Structural geology and stratigraphy of the Whitmore area, Mohave County, Arizona: Dissert. Abs. v.24, no. 2 (new names) 043 qD63

p. 702

Penn. & Permian

Mohave Co.
N.W. Arizona

Hermit Fm. 1963

Stokes, W. L., Geologic map of northwestern Utah: Project of College of Mines and Mineral Industries, Univ. of Utah. (1:250,000)

Legend for western half of state

Leonardian
Permian

NW Utah

Hermit Fm. 1963

Bissell, H. J., Pennsylvanian and Permian systems of southwestern Utah: Intermountain Assoc. Pet. Geol. Guidebook, 12th Ann. Field Conf. 203(273)
qIn8f

p. 47, 49, Fig. 1-2

Permian SW Utah

Hermit fm.

1961

Welsh, J. E., Biostratigraphy of the Pennsylvanian and Permian systems in Southern Nevada, in Abstracts of Doctoral Dissertations, 1957-1960: Univ. of Utah Bull., vol. 52, no. 27

p. 106-107

S (273)
Ut 4

= Apex fm.

Permian

So. Nevada

Hermit Fm.

1963

Hintze, L. F., Geologic map of southwestern Utah (Scale 1:250,000): in pocket of Intermountain Assoc. Pet. Geologists Guidebook, 12th Ann. Field Conf. (on map - A project of Dept. Geol., Brigham Young Univ.).

203(273)
qIn8f

Leonardian
Permian

SW Utah

Hermit Sh.

1963

*Phoenix, D. A., Geology of the Lees Ferry area, Coconino County, Arizona: USGS Bull. 1137

Plates 1 and 2

p. 10-11

Aubrey Gp.

Permian

No. Arizona

Hermit Sh.

1963

Kottlowski, F. E., Paleozoic and Mesozoic strata of southwestern and south-central New Mexico: New Mexico Bur. Mines and Min. Res. Bull. 79 (272)
B

p. 50

Permian

SW & South-Cent.
New Mexico

Hermit Shale
(Aubrey Gp.)

1964

Koons, Donaldson, Structure of the Eastern Hualpai Indian Reservation, Arizona: in Arizona Geol. Soc. Digest, V. 7, Nov.

P. 100

G(274)
qAr4d

Perm.

N. Arizona

7-11-67

Hermit Sh. (age ch.)
(Aubrey Gp.)

1967

McKee, E. D., Arizona and Western New Mexico: Paleotectonic Investigations of the Permian System in the United States: USGS PP 515,
p. 203-223 (200)
qB

from Perm.
see USGS Bull. 1274-A

Low. Perm.
Leonard

Utah & Ariz.-W./N.M.

Hermit Sh.

1967

Beal, M. D., Grand Canyon .... The Story behind the Scenery: K C Pubs., Flagstaff. (monograph)

590(274)
qB362g

p. 23, 26

Perm.

N. Arizona

Hermit Sh.

1967

Maxson, J. H., Preliminary Geologic Map of the Grand Canyon and Vicinity, Arizona, Eastern Section: Grand Canyon Nat. Hist. Assoc., scale 1:62,500.
(Sheet 1 of 3 : East)

NC. Arizona

Perm.

Hermit Sh.

1968

Hamblin, W. K., and Rigby, J. K., Guidebook to the Colorado River, Part I: Lee's Ferry to Phantom Ranch in Grand Canyon National Park: Brigham Young Univ., Geology Studies, v. 15, pt. 5.

G(273)
B76rs

p. 184
16

Perm.

Four Corners area

Hermit fm.

1968
pub.

Bissell, H. J., Permian Stratigraphy of Las Vegas Area, Nevada: in Abs. for 1966, GSA Spec. Papers 101.

p. 387-8

G(200)
G29sp

Perm.

Nev.

Hermit Fm.

1968

Bissell, H. J. and Chilingar, G. V., Shelf-to-Basin Permian Sediments of Southern Nevada, U.S.A.: Internat. Geol. Cong., 23rd, Prague, Proc., Sec. 8.

p. 155-67
157, 162

201
In388rp

Leonardian
Perm.

S. Nev.

Hermit Sh.

1968
revised from 1961

Maxson, J. H., Geologic Map of the Bright Angel Quadrangle, Grand Canyon National Park, Arizona: Grand Canyon Nat. Hist. Assoc., Scale at 1:48,000.
(USGS & Nat. Park Service don't recognize formal subdiv. of Precamb. time.)

text on reverse side to show use

Perm.

Ariz.

Hermit Fm. 1968

Bissell, H. J. and Chilingar, G. V., Basins of Permian Sedimentation in Southern Nevada, U.S.A.: in Abs., 23rd Internat. Geol. Cong., Prague, Czechoslovakia, 1968.



Perm. S. Nev.

Hermit Sh. (age stabilized)

1969

McKee, E. D., Stratified Rocks of the Grand Canyon: in The Colorado River Region and John Wesley Powell: USGS PP 669. (200)

p. 23-58 qB

41

NC. Ariz.

Low. Perm.

1970

Hermit Fm.

Seager, W. R., Low-Angle Gravity Glide Structures in the Northern Virgin Mountains, Nevada and Arizona: GSA Bull., v. 81, no. 5, May. p. 1517-1538 G(200) G29
1520 (T. 1)

Leonard. or Wolfcamp Perm.

Nev. & Ariz.

Hermit Fm.

1970

Bissell, H.J., Petrology and Petrography of Lower Triassic Marine Carbonates of Southern Nevada (U.S.A.): Internat'l. Sed. Pet. Ser., v.14, pub. The Netherlands.

p. 1-27

5-9

341(275)
B543p

S. Nev.

Perm.

1971

Hermit Sh.

Chesser, W. L., The Nature and Development of the Esplanade in the Grand Canyon, Arizona: Utah. Brigham Young Univ., Geol. Stud., v. 18, pt. 3, Dec. p. 3. G(273)
9 B76rs

Perm.

W. Gr. Canyon
Ariz.

Hermit Sh.
(Aubrey Gp. in Grand Canyon area)

1971

Irwin, J. H., Stevens, P. R., & Cooley, M. E.,
Geology of the Paleozoic Rocks, Navajo and Hopi
Indian Reservations, Arizona, New Mexico, &
Utah: USGS PP 521-C.
p. 1 - 32
10(T.1)

(200)
qB

12

with Supai Fm.

SW. area
SE. Utah
NW. N.M.
NE. Ariz.

Penn. † Perm.

Hermit Sh. (age refined) 1971

*Mamay, S. H. & Watt, A. D., An Ovuliferous Callipteroid Plant from the Hermit Shale (Lower Permian) of the Grand Canyon, Arizona: USGS PP 750-C. (200)
p. 48-51 qB

Low. Perm. AZ

1974

Hermit Sh. (91-300 m.)

*McKee, E.D., Paleozoic Rocks of Grand Canyon: GSA, Rocky Mt. Sec., Gdbk. #27, pt. 1.

p. 119-154
144, 146
sts.

G(200)
qG3rf

red beds

Penn. & Perm.

N. AZ

Hermit Sh. 1975

McKee, E. D., The Supai Group...Subdivision and Nomenclature: USGS B. 1395-J.
p. 1-11 (200)
E

1, 5, 6

overlies: Esplanade Ss. (Wolfcamp)

rdsh. orange sts., gray-red mudst. forming ledge & slope = 170.0' thick.

(Leonard)
Low. Perm. n. AZ

Hermit Sh 1976

Grand Canyon Nat. Hist. Assoc. (Breed, W.J.; Billingsley, G.H.Jr.; Ford, T.D., et al), Geologic Map of the Grand Canyon National Park, Arizona: N. AZ Mus., Map at 1:62,500.

under: Coconino Ss (Perm)
over: Esplanade Ss (Penn)



Perm

n. AZ

Hermit Shale (geographic extension) 1977
Lower Permian
southeastern Nevada

Bohannon, R. G., 1977, Geologic map and sections of the Valley of Fire region, north Muddy Mountains, Clark County, Nevada: U.S. Geol. Survey Misc. Field Studies Map MF-849.

Geographically extended into southeastern Nevada from Arizona and Utah.

Low. Perm. se. NV

Hermit Sh 1978

Billingsley, G. H., A synopsis of stratigraphy in the western Grand Canyon: Museum of Northern Arizona, MNA Research Paper 16 330(274)
p. 1-27 B496s
11(Fig.11)

unit is top of sec
over: Supai Gp (Perm)

Perm nw.AZ

Hermit Sh [allocation] 1978

Stewart, J. H. and Carlson, J. E., Geologic Map of Nevada: Prepared by USGS with the Nevada Bureau of Mines and Geology (scale: 1:500,000) [most names are grouped in generalized age categories]



Low.Perm NV

Hermit Fm (here lith changed) 1979
(Sedona Gp)

Blakey, R. C., Lower Permian stratigraphy of the southern Colorado Plateau: Four Corners Geol Soc Gdbk #9, Sept "Permianland" (D. L. Baars, ed) G(270)
p. 115-129, 126(F.12)..internal correl ch qF82f
121-122.."Fm" properly reflects the variety of lithologies in this unit (better than "Sh")
120(F.5)..correl ch

under: Schnebly Hill Fm

Low.Perm AZ

Hermit Fm (new allocation) 1980
(Sedona Gp)

Blakey, R. C., Pennsylvanian and Early Permian Paleogeography, southern Colorado Plateau and vicinity: SEPM Rocky Mtn Paleogeog, Symp 1, June. (Paleoz Paleogeog of w-c USA), Fouch, T. D. & Magathan, E. R., eds.) 362(270) p. 239-257,242(F.2)..strat sec,246(F.6)..corr ch R598p 241..age, 242..equiv to: Organ Rock Fm (Low.Perm) 247, 248..here assigned to Sedona Gp to "maintain historically close relationship bet. Hermit (Supai B) w/ Schnebly Hill (Supai A)"
under: Schnebly Hill Fm, Sedona Gp
over: Esplanade Ss
(Wolfcamp-Leonard)
Low.Perm AZ

Hermit Sh [geog ext to CA] 1982

Emerson, W. S., Geologic development and late Mesozoic deformation of the Little Maria Mountains, Riverside County, California in Frost and Martin, eds, Mesoz-Cenoz Tect Evol of CO River region, CA, AZ, and NV: Anderson-Hamilton vol, Cordilleran Pub [monog] 340(270)
p. 245-254 M562

248..difficult to distinguish from Supai Fm [this lithology is here used in CA]

under: Coconino Ss (Low.Perm)
over: Supai Fm (Penn-Low.Perm)

Low.Perm se.CA

Hermit Fm (137 m) 1988

*Holm, R.F., Geologic map of San Francisco Mountain, Elden Mountain, and Dry Lake Hills, Coconino County, Arizona: USGS Misc. Inv. Map I-1663

11..author follows usage of Blakey (1980); unit equiv to B mbr of Supai Fm of McKee (1945) in Oak Creek Canyon

Perm nc. AZ

Hermit Sh (State usage) 1988

Reynolds, S.J., Geologic Map of Arizona: AZ Geol Survey (produced in cooperation with USGS) Map #26, scale 1:1,000,000 (1"=16 mi); 1 sheet M(274)2
(67 references; several are unpub maps/theses) 1988r

Penn and Perm AZ