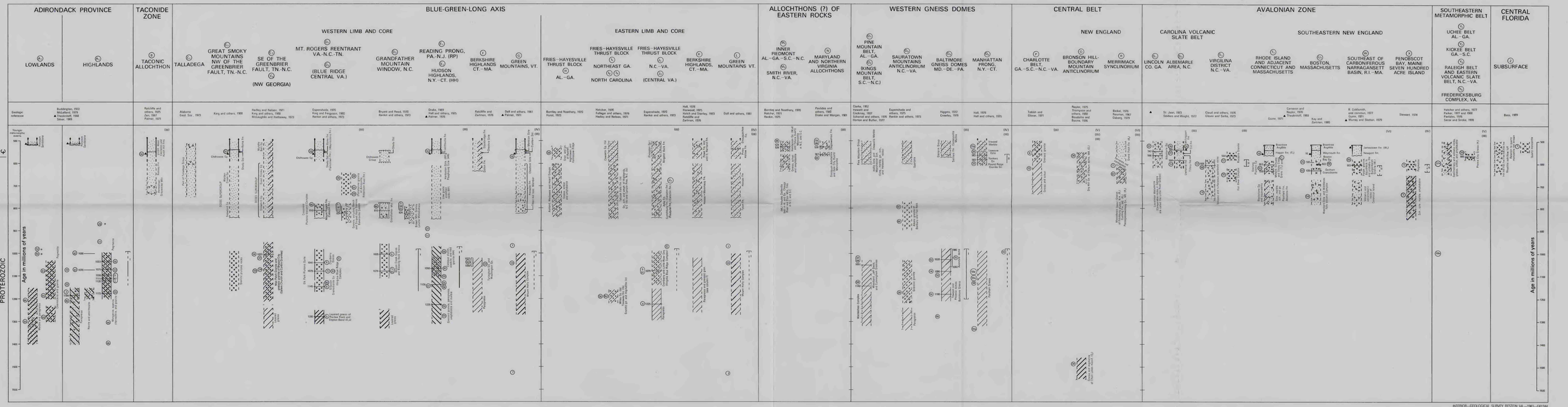

INTERIOR—GEOLOGICAL SURVEY, RESTON, VA.—1983—G81244

EXPLANATION

STRATIFIED ROCKS

Sedimentary rocks

Felsic | Mafic | Sedimentary and volcanic rocks

Volcanic rocks

Age of rock body, showing length of time of rock-forming event

Combined with indicate paleontological control

Age of rock body probably falls within range shown and was a continuous rock-forming event

Age of rock body or bodies falls within range shown, but bar may not represent a single or continuous rock-forming event

First appearance of shelly fossils

K-Ar age (Adirondacks only)

Age determined from Rb-Sr whole-rock isochron or U-Pb discordia curve

INTRUSIVE ROCKS

Felsic | Mafic

Age of rock body or bodies probably falls within range shown

Unconformity

Thrust fault

METAMORPHIC ROCKS

Paleozoic overprint

Amphibolite facies | Granulite facies

Age of rock body or bodies uncertain and may even extend beyond range shown

Neither isotopic nor paleontologic data available

Precambrian metamorphism (where clearly recognizable)

Amphibolite facies | Granulite facies

Stratigraphic section continuous upward and includes rocks younger than 500 million years

Stratigraphic section continuous upward and probably includes rocks younger than 500 million years

Source of isotopic data (see footnotes). Where standing alone without age, placed opposite published (recalculated using current constants and isotopic abundances, if necessary) age. Position is not known to represent a well-determined whole-rock isochron or discordia curve

Identifying symbol of constructed stratigraphic section. Location shown on geologic map (Plate 2).

Column may be used for more than one location. Additional locations indicated by parentheses.

METAMORPHIC EVENTS

Event	M.Y.A.	References
VI Late Paleozoic	~200-250	2 6
V Hercynian	~300	3 6
IV Acadian	~360-400	1 2 3 4 5 6
III Taconic	~430-480	1 2 3 4 5 6
II Virgilina-Avalonian		
I "Grenville"		

(III) Parentheses indicate events younger than 500 million years

Event affects all columns to left of bar and to right of the next bar to the left. Uncertainty of range indicated by dashed bar

Sources of isotopic data

1. Bass, 1969. Two Rb-Sr mineral isochrons.
2. Besancon and others [abs.], 1977. U-Pb zircon ages in the range of 600-620 m.y.
3. Bickford and Turner, 1971. Three Rb-Sr whole-rock isochrons.
3a. Black [abs.], 1978. Rb-Sr whole-rock isochron.
4. Brookins, 1976. Rb-Sr muscovite and whole-rock isochron.
5. Davis and others, 1962. U-Pb zircon; see text.
6a. Doe, 1962. K-Ar phlogopite (zoned pegmatite).
6b. Doe, 1962. Rb-Sr muscovite (unzoned pegmatite).
7. Faul and others, 1963. Pb-alpha zircon.
8. Fullagar, 1971. Rb-Sr whole-rock isochrons on several plutons.
9. Fullagar and Odom, 1973. Four Rb-Sr whole-rock isochrons used herein.
9a. Fullagar and others, 1979. Recalculated Rb-Sr whole-rock isochron of 1189±59 m.y., Toxaway Gneiss (Ib). Recalculated Rb-Sr whole-rock isochron of 1214±83 m.y., migmatite, Mars Hill quadrangle (Ic).
10. Geological Society of London, 1964. Cambrian time divisions.
11. Fisher and others, 1970. Rb-Sr muscovite.
12. Glover and Sinha, 1973. U-Pb zircon.
13. Glover and others [abs.], 1971. U-Pb zircon ages.
14. Grauert, 1974. U-Pb zircon.
15. Grauert and others, 1973. U-Pb zircon ages of different facies of granulites from West Chester-Avondale area.
16. Grauert and Hall, 1973. U-Pb zircon.
17. Hall and others, 1975. Rb-Sr whole-rock isochrons. Ages recalculated by D. G. Mose (written commun., 1980) from original data. See Table 1.
18. Heath and Fairbairn, 1969. Rb-Sr whole-rock isochron; seven samples of syenitic gneiss.
19. Higgins and others, 1977. U-Pb zircon.
20. Hills and Butler [abs.], 1969, Rb-Sr whole-rock isochron, six samples.
21. Hills and Dasch, 1972. Ambiguous Rb-Sr whole-rock isochron.
22. Hills and Gast, 1964. Rb-Sr whole-rock isochron, eight samples.
23. Hills and Isachsen [abs.], 1975. Rb-Sr whole-rock isochron; eight samples.
24. Kish and others, 1975. Rb-Sr whole-rock isochron; no data.
25. Kovach and others, 1977. Rb-Sr whole-rock isochron; samples from nine localities. Supersedes ages published by Fairbairn and others, 1967.
26. Long, 1969. Rb-Sr whole-rock isochron; seven samples of Yonkers Gneiss.
27. Long and others, 1959. U-Pb uraninite and monazite.
28. Long and Kulp, 1962. Pb-Pb zircon age, Fordham Gneiss (1113 m.y.); K-Ar biotite from pegmatite, Speculator, N.Y.
29. Lukert and others, 1977. U-Pb zircon; no data. Ages stated are Robertson River Formation (732 m.y.), Flint Hill Gneiss (1081 m.y.), and Old Rag Granite (1140 m.y.).
30. McConnell and others [abs.], 1976. U-Pb zircon.
31. Mose, 1975, and written commun., 1980. Rb-Sr whole-rock isochron; 11 samples of Tyringham Gneiss.
32. Mose and Hayes, 1975. Rb-Sr whole-rock isochron; six samples of Pound Ridge Granite Gneiss.
33. Naylor, 1975. Rb-Sr muscovite. In a subsequent paper, Naylor (1976) noted that an earlier reported Pb-alpha age of 1100 m.y. from the Green Mountains (Faul and others, 1963) is actually from detrital zircon in the Hoosac Formation.
34. Naylor and others [abs.], 1973. Pb-Pb zircon.
35. Odom and Fullagar [abs.], 1971. Rb-Sr whole-rock isochron (15 samples)
36. Odom and Fullagar, 1973. Rb-Sr whole-rock isochron (18 samples) and U-Pb zircon (four samples).
37. Odom and others [abs.], 1973. U-Pb zircon ages of greater than 1 b.y. reported for Woodland Gneiss and charnockite of the Pine Mountain belt and Corbin Granite of northwest Georgia.
37a. Pavlides, 1976. Pb-Pb zircon, Fredericksburg Complex.
38. Rankin, 1975. Pb-Pb zircon; one sample.
39. Rankin and others, 1973. Pb-Pb zircon; one sample.
40. Rankin and others, 1969. U-Pb zircon; five samples of rhyolite.
41. Ratcliffe and others, 1972. Rb-Sr whole-rock isochron.
42. Ratcliffe and Zartman, 1976. U-Pb zircon; limiting intercepts of discordia lines.
44. Seiders and others, 1975. U-Pb zircon; four samples.
45. Silver [abs.], 1964. U-Pb zircon; syenite and alaskitic granite.
46. Silver [abs.], 1965. U-Pb zircon; hornblende-biotite-quartzite-plagioclase gneisses from several localities. Rocks interpreted as dacitic volcanic rocks interstratified with metasedimentary layers.
47. Silver, 1969. U-Pb zircon.
48. Spooner and Fairbairn, 1970. Rb-Sr whole-rock isochrons. Two isochrons recalculated by J. G. Arth (written commun., 1978) from data given. A six-point isochron of 1303±136 was obtained for charnockite gneiss from Crane Mountain. A five-point isochron of 1384±444 was obtained for pyroxene gneiss from Indian, Blue Mountain, and West Canada Lake quadrangles.
49. Tilton and others, 1970. U-Pb zircon age from Woodstock dome plots very close to the discordia curve for layered gneiss of the North Carolina-Tennessee Blue Ridge of Davis and others (1962).
50. Tilton and others, 1960. U-Pb zircon.
Blue Ridge: Pb-Pb age of 1130 m.y. from hypersthene granodiorite from Mary's Rock tunnel, Shenandoah National Park, Virginia.
Hudson Highlands: two-point U-Pb age of 1149 m.y. calculated from data given for Storm King Granite and Canada Hill Granite Gneiss; Pb-Pb ages are 1040 m.y. and 1150 m.y. respectively.
51. Tilton and others, 1958. Pb-Pb zircon ages, Phoenix and Towson domes. Superseded by work of Grauert (1974).
52. Wasserburg, 1961. K-Ar muscovite, pegmatite, Whippoorwill Corners, N.Y.
53. Wetherill and others, 1968. Rb-Sr whole-rock isochron (five samples).
54. Wright and Seiders, 1980. U-Pb zircon; four samples. Chord recalculated.
55. Mose, D. G., written commun., 1980. Rb-Sr whole-rock isochron.
55a. Mose, D. G., and Hall, L. M., written commun., 1980. Rb-Sr whole-rock isochron.
56. Odom, A. L., unpublished data. Rb-Sr whole-rock isochron and U-pb zircon.
Wiley Gneiss: two nearly concordant U-Pb ages about 1190 m.y.
Corbin Granite: Rb-Sr whole-rock isochron of 1003±50 m.y.; one nearly concordant U-Pb age about 1080 m.y.
Salem Church Granite: Pb-Pb ages of 1030 m.y.
Granite and gneiss of Kennesaw Mtn., Austell, and Hightower: U-Pb age of about 560 m.y. (one sample each).
57. Carpenter, R. H., Odom, A. L., and Hartley, M. E., written commun., 1978. Rb-Sr whole-rock isochron (recalculated by J. G. Arth, written commun., 1980, from data given) and U-Pb zircon.
58. Odom, A. L., and Kish, S. A., unpublished data. Rb-Sr whole-rock isochron and U-Pb zircon.
59. Russell, G. S., and Odom, A. L., unpublished data. U-Pb zircon.
60. Stern, T. W., and Espenshade, G. H., unpublished data. Pb-Pb zircon, granite at Danbury, N.C.
61. Stern, T. W., and Rankin, D. W., unpublished data. U-Pb zircon (see text). Pb-Pb zircon, granite at Flat Rock, N.C.
62. Zartman, R. E., and Naylor, R. S., unpublished data. Rb-Sr whole-rock isochron and U-Pb zircon.
64. Olszewski [abs.], 1978. U-Pb zircon.
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66. Kaye and Zartman, 1980. U-Pb zircon.
67. Aleinikoff and others, 1979. U-Pb zircon and monazite.
68. Black and Fullagar [abs.], 1976. Rb-Sr whole-rock isochron.
69. Lumbers, 1979, and written communication, 1979. Silver and Lumbers, 1966. Ages of volcanic rocks within the carbonate section and granitic rocks which intrude the stratified rocks in southern Ontario, Canada.
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70. Butler, 1972.
71. Butler, 1973.
73. Dallmeyer and Sutter, 1976.
74. Moench and Zartman, 1976.
75. Naylor, 1971.
76. Odom and Russell [abs.], 1975.
77. Wetherill and others, 1966.
78. Zen, 1972.
79. Grew and Day, 1972.
80. Secor and Snoke, 1978.

CORRELATION CHART FOR PRECAMBRIAN ROCKS OF THE EASTERN UNITED STATES