DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS INVESTIGATIONS SERIES
MAP I-994
(WEST HALF)

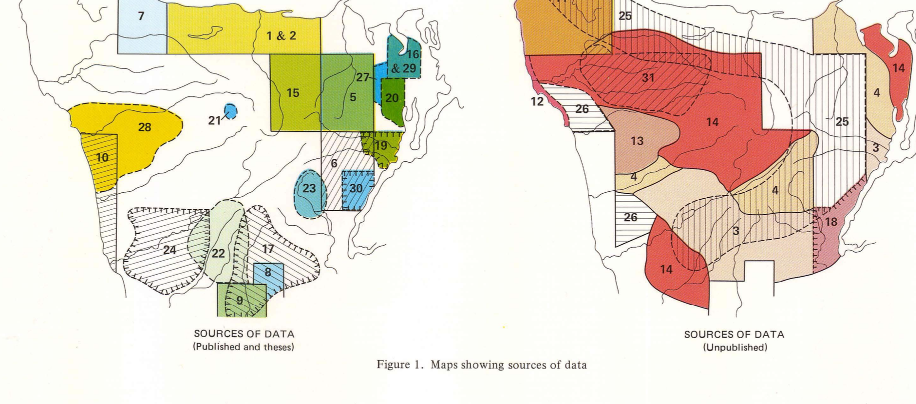

Figure 1. Maps showing sources of data

Note: This data list is divided into two separately alphabetized sections. Below is material used more or less unmodified (solid lines)

(1) Brown, Gower, and Snavely (1960)
(2) Brown (1968)
(3) W. M. Cady, N. S. MacLeod, J. W. Shervais, M. L. Sorensen, R. J. Stewart, and R. B. Tallyn (unpublished data).
(4) W. M. Cady, R. W. Tabor, R. Koeppen, N. S. MacLeod, K. Pisciotto, M. L. Sorensen, R. J. Stewart, R. Tallyn, amd R. S. Yeats (unpublished data).
(5) Cady, Tabor, MacLeod, and Sorensen (1972).
(6) Cady, Sorensen, and MacLeod (1972).
(7) Gower (1960)
(8) Rau (1966)
(9) Rau (1967)
(10) Rau (1975)
(11) P. D. Snavely, Jr., N. S. MacLeod, and J. E. Pearl (written commun., 1974).
(12) P. D. Snavely, Jr., (written commun., 1970).
(13) R. J. Stewart (written commun.,1974).
(14) R. W. Tabor, K. Pisciotto, R. J. Stewart, R. B. Tallyn, and R. S. Yeats (unpublished data).
(15) Tabor, Yeats, and Sorensen (1972).

Material used with considerable modification and addition (Dashed lines—bedrock geology. Hatchered lines—surficial deposits).

(16) Allison (1959).
(17) Carson (1970).
(18) R. J. Carson, III (written commun., 1974).
(19) Frisken (1965).
(20) Hamlin (1962).
(21) Hawkins (1967).
(22) Harvey (1959).
(23) Miller (1967).
(24) Moore (1965).
(25) C. F. Park, Jr., J. R. Balsley, Jr., W. M. Cady, F. M. Chace, R. H. Cowie, H. L. James, J. M. Nelson, R. J. Roberts, J. W. Robinson, J. A. Straczek, S. E. Watson, and R. G. Yates (unpublished data).
(26) W. W. Rau(written commun., 1974).
(27) Sherman (1960).
(28) Stewart (1970).
(29) Thoms (1959).
(30) Todd (1939).
(31) Walter Warren (unpublished data).

GEOLOGIC MAP OF THE OLYMPIC PENINSULA, WASHINGTON

By R. W. Tabor and W. M. Cady

INTRODUCTION

The Olympic Peninsula has long been a geologic puzzle because of its inaccessibility, and exploration of the rugged mountainous interior came late in the history of the United States. The *Press* Party crossed the range in the winter of 1889–90 and reported slate and sandstone in the core, but they lost all their geologic specimens when their raft capsized on the Quinault River (Wood, 1967, p. 108, 192).

Serious geologic studies of the peninsula began with Arnold (1906). Reagan (1909), Weaver (1912, 1916), Lupton (1914), and Palmer (1927). Most of this early work was confined to the coast and flanks of the mountains on the northwestern peninsula. Weaver (1937, p. 26–34) established a general picture of Olympic Peninsula geology, but the first systematic mapping was begun in the late 1930's by the U.S. Geological Survey's manganese project under the leadership of C. F. Park, Jr. (1942, 1946) and by Walter Warren (1941). About this same time students from the University of Washington began mapping small areas (fig. 1) and one student, Wilbert Danner, prepared the first summary of Olympic geology (Danner, 1955).

Our work stems in part from the early mapping of Park and Warren and the later quadrangle mapping of Gower (1960) and Brown, Gower, and Snavely (1960). In 1961

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are very similar, but where exposures are poor, its trace can be inferred by lithologies; sandstone of the Needles-Gray Wolf lithic assemblage of the core contains conspicuous mica and is generally lighter colored and coarser grained than dark volcanic sandstone of the Blue Mountain unit.

In general, volcanic rocks of the Crescent Formation intertongue with sedimentary rocks of the overlying Aldwell Formation, although along the Sekiu River to the northwest the formations are unconformable (P. D. Snavely, written commun. 1974). The Blue Mountain unit is indistinguishable from most of the Aldwell and parts of the Lyre and Twin River Formations. In the Dungeness forks–Texas Valley area, the Blue Mountain unit may well include rocks assigned elsewhere to the Aldwell and the lower part of the Twin River Formation. In this area the Blue Mountain unit does include rocks mapped as undifferentiated Lyre and Twin River by Brown, Gower, and Snavely (1960). Conglomerates of this same area are similar to Lyre conglomerate, and some could be correlative. In the Wynoochee River area, Rau (1967, p. 11) reports an unconformity at the top of the Crescent Formation.

Most of the peripheral sedimentary rocks contain no regional metamorphic minerals except for phyllosilicates and zeolites. Basalt of the Crescent contains considerable preh-

[illegible]

Two metamorphic events are recorded in rocks of the east part of the core. A general recrystallization associated with penetrative deformation occurred about 29 m.y. ago (middle Oligocene) and a local recrystallization associated with faulting and quartz veining took place about 17 m.y. ago (middle Miocene; Tabor, 1972). Metamorphic zonation as depicted on the map is based on thin-section study. The laumontite-prehnite and pumpellyite line and parts of the prehnite and pumpellyite-pumpellyite line are from Stewart (1974; written commun., 1974). Pumpellyite is difficult to identify in many areas, thus the boundaries are tentative. Laumontite and other zeolites also occur in peripheral rocks of the northwestern peninsula (P. D. Snavely, Jr., and N. S. MacLeod, written commun., 1973), but their limits have not been mapped.

Basaltic rocks

Basaltic rocks in the core include basalt, pillow basalt, basaltic breccia and tuff, diabase and gabbro, tuffaceous argillite, and limestone. In some units the basaltic rocks are metamorphosed to greenstone and greenschist. Although some masses of basaltic rocks, especially the larger ones, may be in place within their enclosing sedimentary unit (for instance, the Elwha lithologic assemblage), many of the small pods and lenses are surroun-

[illegible]

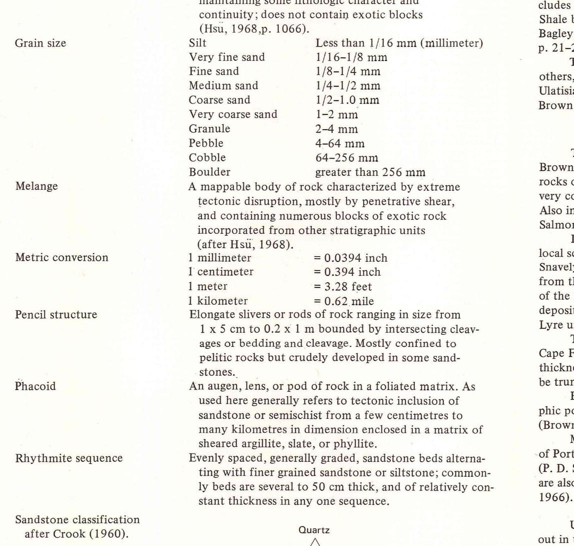

Figure 2. Map showing major geologic terranes, faults, and speculative faults

INDEX MAP OF WASHINGTON SHOWING AREA OF REPORT

Base from U.S. Geological Survey

SCALE 1:125 000

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL
1976 MAGNETIC DECLINATION VARIES FROM 21°30′ to 22° EAST OF TRUE NORTH

Interior—Geological Survey, Reston, Va.—1978-G76166

Geology mapped in 1961–74

REFERENCES CITED

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By
R. W. Tabor and W. M. Cady
1978

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