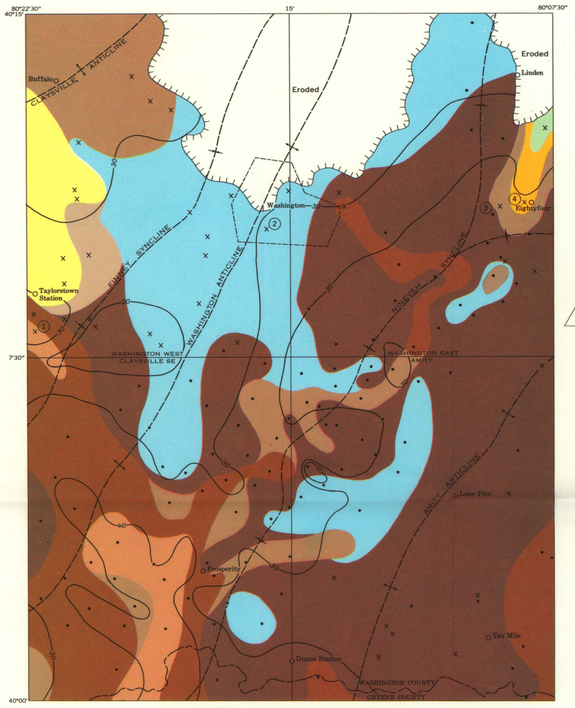
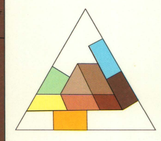
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF INTERNAL AFFAIRS

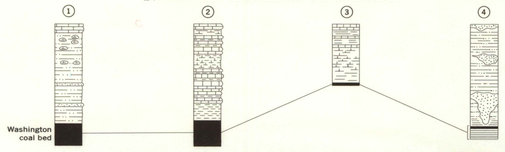
PROFESSIONAL PAPER 621
PLATE 4

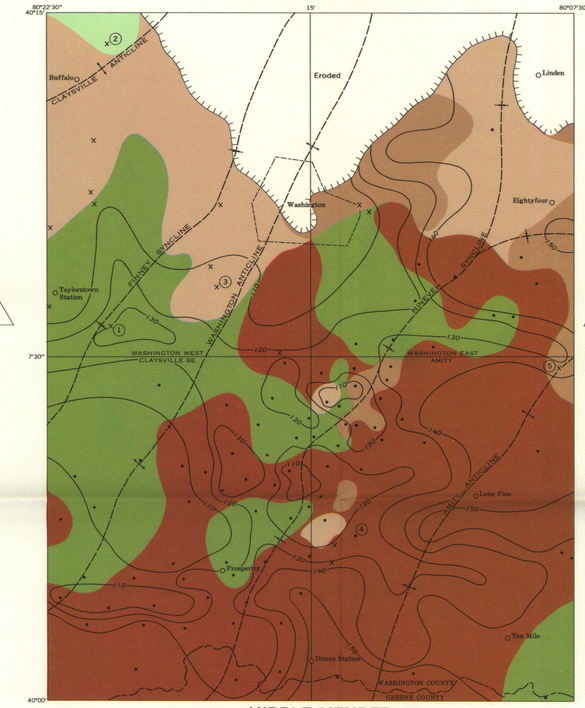
WASHINGTON FORMATION





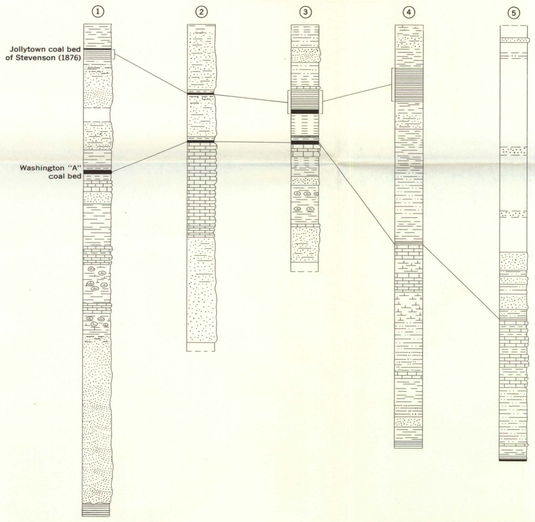
D. LOWER LIMESTONE MEMBER

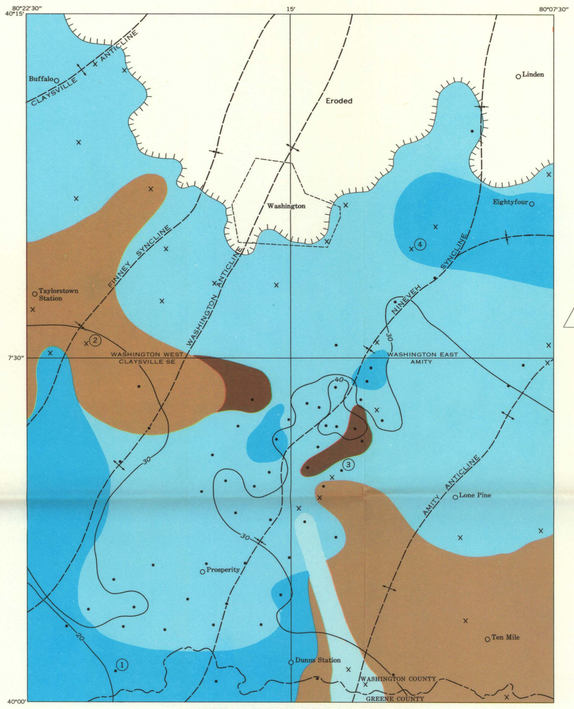


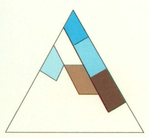


Dark green on this map represents calcareous sandy siltstone facies where prominent sandstone is masked by overlying finer grained rocks

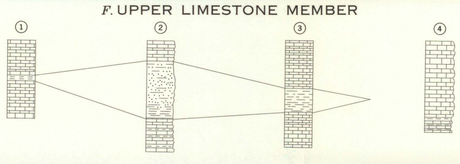
E. MIDDLE MEMBER







F. UPPER LIMESTONE MEMBER



EXPLANATION

- Sandstone
- Sandy mudstone
- Bone coal and shaly coal
- Crossbedded sandstone
- Shaly mudstone
- Limestone
- Thin-bedded sandstone
- Claystone
- Clayey limestone
- Shaly sandstone
- Calcareous mudstone
- Cherty limestone
- Sandy siltstone
- Shaly carbonaceous mudstone
- Limestone nodules
- Siltstone
- Coal
- Concealed interval *Dashed line indicates overlying or underlying rocks not exposed*

Symbols for rock types shown in columnar sections

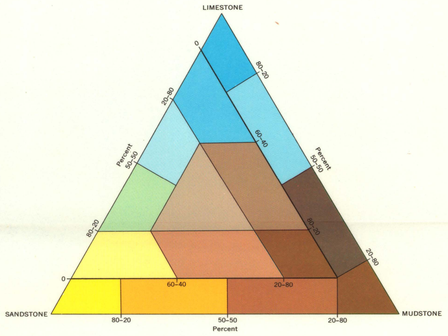
30 — Thickness line, in feet

Anticline — Syncline

Fold axes

Eroded — Generalized area where member has been removed by post-Early Permian erosion

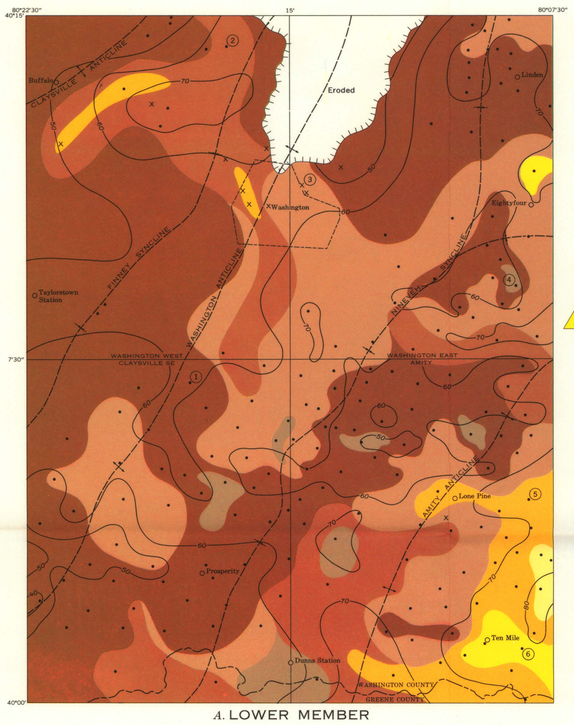
1 Core hole — 2 Outcrop
Data points used in lithofacies computations

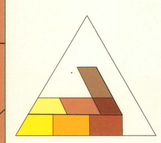


INDEX TO LITHOFACIES PATTERNS

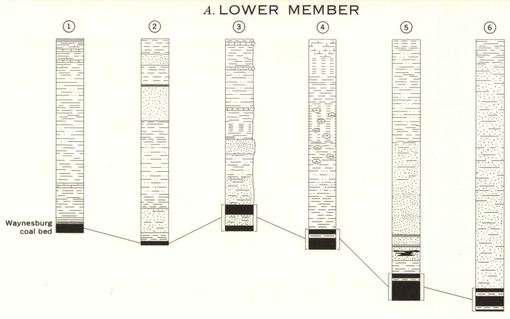
The lithofacies classification is based on lateral and vertical variations in the abundance of three general types of rock: sandstone, mudstone, and limestone. The diagram shows, in percent, the relative abundance of each rock type in a facies. Variations in abundance of only two rock types are shown by the facies along the bottom and right-hand margins of the diagram. The amount of each rock type, excluding coal, was calculated for each data point. All facies are laterally gradational; amounts of the three general rock types within a facies may vary within the percentage ranges shown in the diagram. Lithofacies relations in each member are shown in small diagrams beside individual maps. Because the composition of mudstone in the three-end-member diagram is similar to that in the outer two-end-member part, the same pattern is used for both on the map

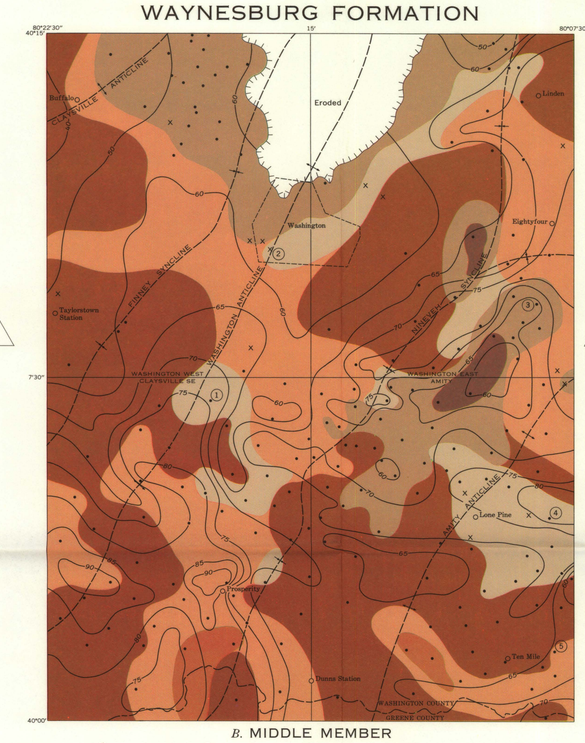
WAYNESBURG FORMATION

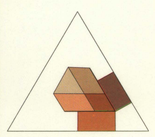




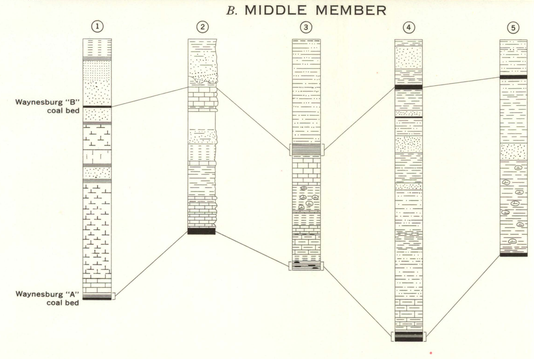
A. LOWER MEMBER

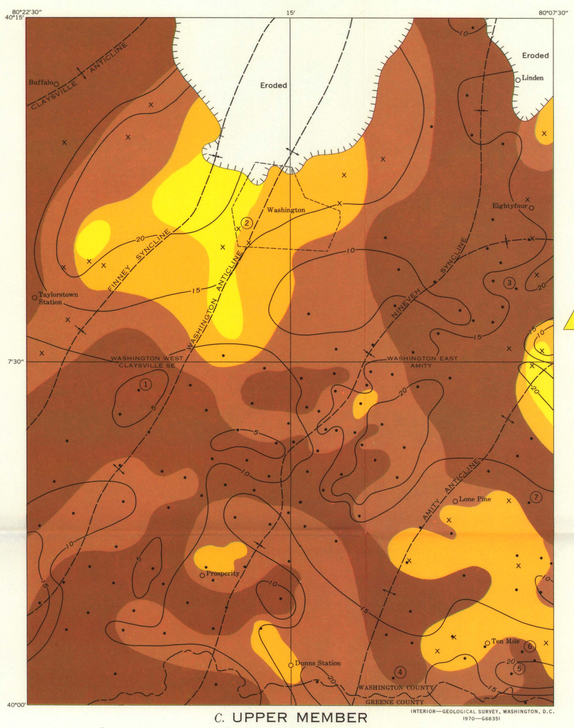


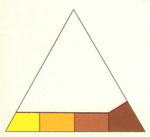




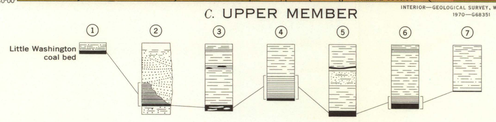
B. MIDDLE MEMBER

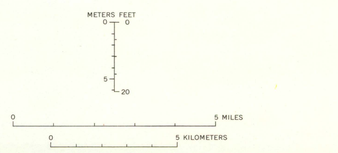






C. UPPER MEMBER





INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.
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MAPS SHOWING LITHOFACIES AND THICKNESS OF THE MEMBERS OF THE WAYNESBURG AND WASHINGTON FORMATIONS, WASHINGTON AREA, PENNSYLVANIA