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On the use of the term Newark for Triassic and Early Jurassic rocks of eastern North America

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with 1 figure and 1 table

Abstract. Triassic and Early Jurassic predominately red sedimentary rocks and minor basic volcanic rocks fill discrete basins in eastern North America. These rocks have been termed the Newark Group. Recently, this term has fallen into disuse in favor of interpretive designations resulting in a confusing and contradictory terminology. It is proposed that the rank of the term Newark be raised to supergroup to conform to the American code of Stratigraphic Nomenclature and to permit the use of group names for individual basins.

Zusammenfassung. Die rot gefärbten Sedimente der Trias und des unteren Jura mit ihren Einschaltungen vulkanischer Gesteine sind in Ost-Amerika auf wohl definierte Becken beschränkt und werden als Newark-Gruppe zusammengefaßt. Da diesem Begriff in letzter Zeit ein mißbräuchlich interpretierender Sinn gegeben wurde, entstand eine sich widersprechende Terminologie. Es wird hiermit vorgeschlagen, dem Begriff „Newark“ im Einklang mit dem amerikanischen Katalog stratigraphischer Nomenklatur den Rang einer Übergruppe (Supergroup) einzuräumen, um den Gebrauch von Gruppen-Namen für die individuellen Sedimentationsbecken zu erlauben.

In 1856 W. C. REDFIELD proposed the term Newark Group to include the predominately red sedimentary rocks and basaltic volcanics exposed in numerous basins in eastern North America (Fig. 1). Previous to this, these rocks had been referred to by their supposed age or European correlate, *i. e.* New Red Sandstone, Triassic, Keuper, etc. As RUSSELL (1892, p. 15) correctly pointed out, the name Newark “. . . is the oldest specific title not implying opinion as to geologic age”. *Thus, it has clear priority as a strict rock-stratigraphic term.* Subsequently, the rank of Newark changed with contemporary stratigraphic practice: RUSSELL (1889) used system rather than group; MOORE (1933) preferred series to system, and McLEARN (1953) returned to group.

Although the name Newark Group has been widely used for more than a century, several authors have suggested it be dropped or its definition altered. KLEIN (1960, 1962) concluded that since the term Newark had been used by some authors in a time-stratigraphic sense, the term should be restricted to include only the formations of the Newark Basin. He proposed

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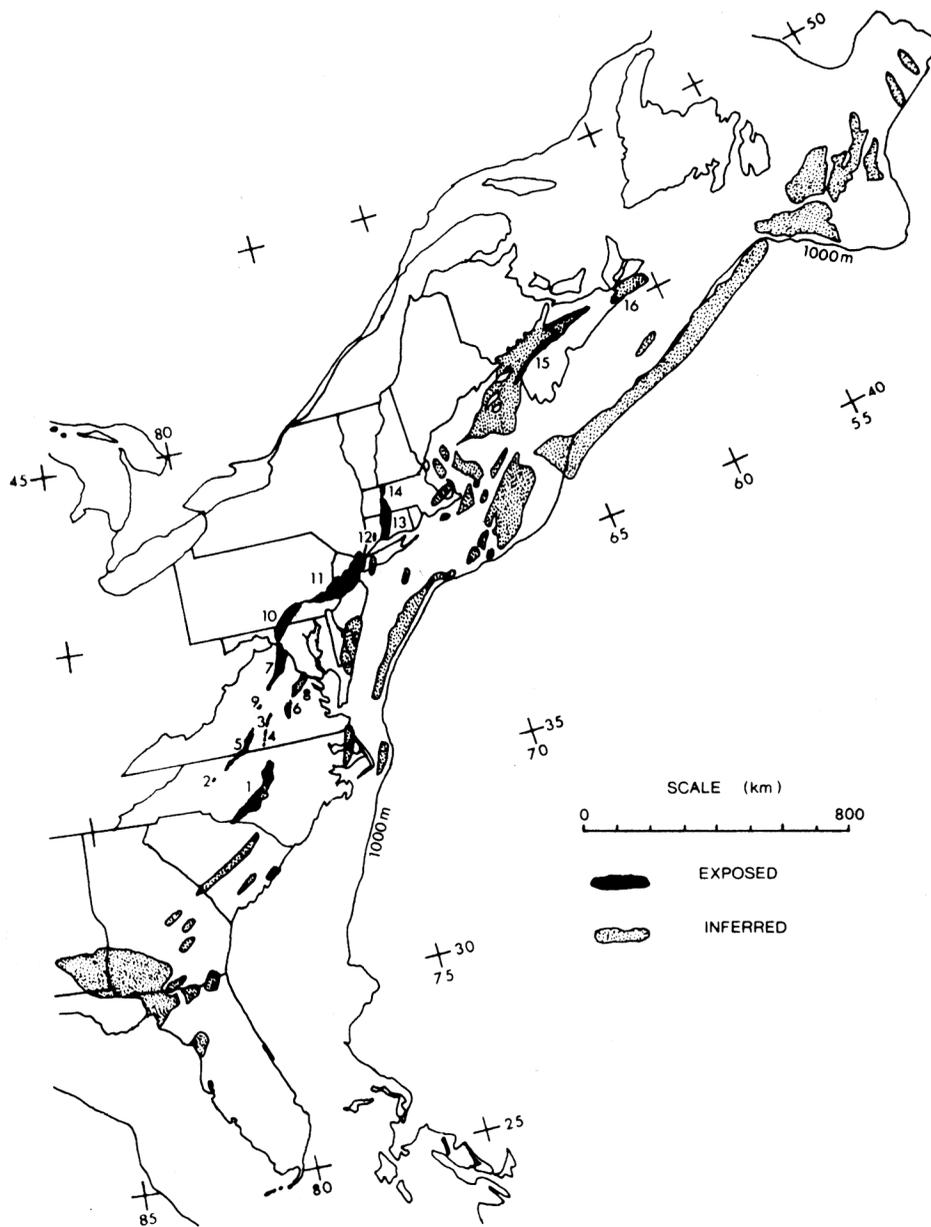


Fig. 1. Newark Supergroup of eastern North America. Key to numbers given in Table 1. Data primarily from CALVER 1963; JANSÁ & WADE 1975; KING et al. 1944; and VAN HOUTEN 1977.

the Fundy Group for the rocks of the Fundy Basin in the Maritime Provinces of Canada – rocks which RUSSELL (1892) showed on lithologic grounds to belong to the Newark. THAYER (1970) adopted KLEIN's reasoning and proposed the Dan River Group for the formations of the Dan River and Danville Basins of North Carolina and Virginia. This practice leaves no inclusive name for these deposits. Most authors have used interpretive terms such as "the Triassic rocks of the Newark Basin" where a rock stratigraphic label is called for. This is unfortunate, especially in light of the recent revelations that part of the "East Coast Triassic" is Jurassic (CORNET et al. 1973; OLSEN & GALTON 1977). An inclusive term for all the rocks of these basins is clearly needed because of their close lithologic and structural relation (RUSSELL 1892; VAN HOUTEN 1977), and the name with priority for this purpose is Newark [C. S. N. (Code of Stratigraphic Nomenclature), Article 11]. Furthermore, incorrect usage of the term Newark by some workers is no reason for discarding the familiar and long standing term (C. S. N., Article 11 b). Finally, according to the Code of Stratigraphic Nomenclature (Article 14), redefinition of the term Newark, as KLEIN (1962) proposed, requires as much justification as the proposition of a new term. In view of the familiarity of the meaning of Newark, as defined by REDFIELD and RUSSELL, this justification is lacking.

The Code of Stratigraphic Nomenclature suggests two ways of retaining Newark as the inclusive rock-stratigraphic name: 1, the usage and rank of Newark Group can remain as REDFIELD (1856) intended – use of KLEIN's (1962) and THAYER's (1970) group names for the formations of individual basins must then be dropped or changed in rank to subgroup, for groups cannot be composed of other groups (C. N. S., Article 9); or 2, the rank of the term Newark can be raised so that group names may be included in a higher rock-stratigraphic category – supergroup can be used for just such a formal assemblage of groups or groups and formations (C. N. S., Article 9e). *Neither of these possibilities involves a change in the meaning of the term Newark* – merely a change in rank similar to those proposed by RUSSELL (1889), MOORE (1933), and McLEARN (1953).

In most individual Newark deposits the rocks are divided into lithologically distinct formations. The lithologic differences among basins are real and deserve nominal recognition. A rock-stratigraphic term for the formations of individual basins is, therefore, needed. Although subgroups could be used for this purpose, such usage would require the alteration of a number of terms and possibly leave no way of formally clustering formations into units of lower rank than the inclusive term for formations of single basins. Therefore, *I propose the rank of the term Newark be raised to supergroup so that group names can be used.*

As currently defined (OLSEN, MS; VAN HOUTEN 1977), the Newark Supergroup consists of predominately red clastics and minor basaltic volcanics exposed in 13 major and 7 minor, elongate basins preserved in the Piedmont, New England, and Maritime Physiographic Provinces of eastern North America (Fig. 1, Table 1). In general, the long axes of these basins parallel the fabric of the crystalline piedmont of the Appalachian orogene (RODGERS 1970; VAN HOUTEN 1977). The rocks of these basins present a unified lithology and structure and unconformably overlie (or intrude) Precambrian and Paleozoic rocks, and are, in turn, overlain by post-Jurassic rocks of the Coastal Plain, Pleistocene deposits or Recent alluvium and soils. In addition, early Mesozoic red beds at the base of some sequences on the continental shelf and at least 12 units recognised beneath the Atlantic Coastal Plain probably belong in the Newark Supergroup (Fig. 1).

Table 1 Exposed divisions of the Newark Supergroup. Note that "none" under the rock-stratigraphic term category indicates that, although the rocks of the basin have been divided into formations, no inclusive name for the formations of that basin has been proposed. Rock-stratigraphic terms and basin names from CALVER 1963; DE BOER 1968; EMMONS 1857; JANS & WADE 1975; KING et al. 1944; KLEIN 1962; PLATT 1952; RUSSELL 1892; SHALER & WOODWORTH 1897-1898; and THAYER 1970. Age ranges from CORNET & TRAVERSE 1975 and CORNET, pers. comm.; and OLSEN & GALTON 1977.

Key to Figure 1	Rock-stratigraphic term	Basin name	Age range
1	Chatham Group	Deep River Basin	Carnian-?Norian (Late Triassic)
2	undifferentiated	Davie County Basin	?Late Triassic
3	undifferentiated	Farmville Basin	?Carnian (Late Triassic)
4	undifferentiated	4 small basins south of Farmville Basin	?Carnian (Late Triassic)
5	Dan River Group	Dan River and Danville Basins	Carnian-?Norian (Late Triassic)
6	Tuckahoe and Chesterfield Groups	Richmond Basin and subsidiary basins	Carnian (Late Triassic)
7	none	Culpeper Basin	Norian-?Sinemurian (Late Triassic-Early Jurassic)
8	none	Taylorville Basin	Carnian (Late Triassic)
9	undifferentiated	Scottsville Basin and 2 subsidiary basins	?Late Triassic-Early Jurassic
10	none	Gettysburg Basin	Carnian-Hettangian (Late Triassic-Early Jurassic)
11	none	Newark Basin	Carnian-Sinemurian (Late Triassic-Early Jurassic)
12	none	Pomperaug Basin	?Late Triassic-Early Jurassic
13	none	Hartford Basin and subsidiary Cherry Brook Basin	Norian-?Bajocian (Late Triassic-?Middle Jurassic)
14	none	Deerfield Basin	?Norian-?Toarcian (Late Triassic-Early Jurassic)
15	Fundy Group	Fundy Basin	?Middle Triassic-Early Jurassic
16	Chedabucto Formation (=Eurydice Formation?)	Chedabucto Basin (=Orpheus Basin?)	?Late Triassic-Early Jurassic

The need for consistent rock-stratigraphic classification has been discussed by many authors and is widely recognised (SCHENCK & MULLER 1941; American Commission on Stratigraphic Nomenclature, 1947, 1961; KRUMBEIN & SLOSS 1963). Raising the rank of the term Newark to supergroup preserves the original and familiar meaning of REDFIELD'S designation, allows the formations of individual basins to be included in specific groups while remaining in a strictly rock-stratigraphic hierarchy, and permits the maximum amount of flexibility for future subdivision. This scheme conforms to the principles and intent of the Code of Stratigraphic Nomenclature and it is hoped this classification will lead to stability in terminology and help avoid the pitfalls of using interpretive terms where descriptive labels are required.

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