Doliognathus, Eotaphrus, Gnathodus, Protognathodus, Pseudopolygnathus, and *Scaliognathus* – are revised, and 5 species and 17 numbered morphotypes of 7 previously known species are described as new. Between the highest range of *Siphonodella* and lowest range of *Cavusgnathus* (in North America) and *Gnathodus bilineatus* (in Europe) a zonation is proposed to consist in ascending order, of the Lower and Upper *typicus-, anchoralis-, latus-,* and *texanus*-Zones. Taxa proposed by COOPER (1939) and VOGES (1959) are reidentified.

Organic Metamorphism and Thermal Maturity of Paleozoic Strata of Southern Ontario Based on Studies of Conodont and Acritarch Alteration.

By F. D. LEGALL and CH. R. BARNES

Department of Earth Sciences, University of Waterloo, Waterloo, Ontario N2L 3G1.

Micropaleontological studies were undertaken to establish the burial temperature of the Paleozoic sedimentary sequence in southern Ontario through investigation of colour alteration of conodont and palynomorphs. Over 800 samples were used from both surface and subsurface localities that penetrated various units of Ordovician, Silurian and Devonian age in the subsurface.

Three thermal alteration zones are recognized along the surface and in the subsurface. The first extends from the top of the Paleozoic sedimentary sequence to depths extending into Upper Middle Ordovician strata. In this zone, the conodont alteration index (CAI) is 1.5 and reflects a burial temperature of 60–80°C. The second zone includes the remainder of the Ordovician section in southwestern Ontario and part of the Ottawa Valley in eastern Ontario. The CAI values for this zone lie in range 2–2.5 and suggest burial temperatures of about 80–90°C. Superimposed on this broadscale thermal alteration pattern that reflects burial depth, are several areas with higher alteration indices of 2.5–3 in the Ottawa Valley. These are interpreted as being the result of unusually high heat flow related to Cretaceous rifting that produced the Ottawa-Bonnechère graben. Study of acritarchs shows three changes in colour from light to dark yellow, to orange and dark brown within the zone defined by CAI 1.5.

The micropaleontological studies of thermal maturation have also been integrated with studies of the geochemistry and carbon isotope composition of Ontario's natural gases. The carbon isotopic composition indicates that most gases appear to have been generated from mature and overmature source rocks outside of southern Ontario.

Late Bashkirian – Early Moscovian Conodonts in a Section of the Cantabrian Mountains (Spain).

By C. A. MÈNDEZ and J. R. MENENDEZ ALVAREZ

Departamento de Paleontologia, Universidad de Oviedo, Spain.

Several conodont faunas were collected in a section composed essentially by gray coloured limestones.

This section consists of 120 m of gray massive limestones (upper part of Valdeteja Formation), followed by 114 m of dark-gray thin bedded limestones with interbedded shales and chert at its basal 50 m and gray massive and bioclastic limestones in the uppermost 64 m (lower part of Caliza de Picos de Europa).

Platform conodonts are dominant. The genera are mainly composed by species of *Declinognathodus, Gondolella, Idiognathodus, Idiognathoides* and *Neognathodus,* among them, *Idiognathodus* and *Idiognathoides* are the most abundant genera.

Phylogeny and Biostratigraphy of the Conodont *Gondolella* (Carboniferous-Permian), Eastern and Central North America.

By G. K. MERRILL and P. H. von BITTER

Department of Geology, College of Charleston, Charleston, South Carolina 29 401, USA; Department of Invertebrate Paleontology, Royal Ontario Museum, Toronto, Ontario M5S 2C6, Canada.

Gondolella STAUFFER and PLUMMER, 1932 (type-species *G. elegantula,* O. D.) possessed a multielement apparatus consisting of as many as seven kinds of elements (von BITTER, 1976) of which the