NEW SPECIES OF PERMIAN GASTROPODS FROM QUEENSLAND

Robin Wass
Department of Geology and Geophysics, University of Sydney

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Synopsis

Three new species of gastropods, *Peruvispira parva*, sp. nov., *Keeneia afflicta*, sp. nov., and *Strotostoma*, sp. nov., are described and figured from Permian sediments at Cracow, Queensland.

Introduction

Recent work by the writer on faunas of the Cracow District in the south-eastern Bowen Basin, Queensland has revealed specimens of the species *Peruvispira parva* and *Keeneia afflicta* in the Buffel Formation. Specimens of *Strotostoma* sp. nov. are recorded from the Barfield Formation. All species were recorded by Wass (1965).

This account is based on part of a B.Sc. Honours thesis submitted in 1962 to the Department of Geology, University of Queensland. Fossil specimen numbers prefixed by "F" and locality numbers prefixed by "L" belong to the University of Queensland, Department of Geology catalogues. All fossil specimens are housed within the Department. Map references, unless otherwise stated, refer to the Mundubbera 1:253,440 military map.

Systematic Descriptions

Order	Archaeogastropoda Theile, 1925
Suborder	Pleurotomariacea Swainson, 1840
Superfamily	Pleurotomariina Cox and Knight, 1960
Family	Eotomariidae Wenz, 1938
Subfamily	Neilsoniinae Knight, 1960
Genus	*Peruvispira* Chronic, 1949

1949, *Peruvispira* Chronic, p. 146.
1953, *Peruvispira* Chronic, p. 139.
1958, *Pleurocinctosa* Fletcher, p. 139.
1961, *Peruvispira* Dickins, p. 144.

Type Species.—(By original designation) *Peruvispira delicata* Chronic, 1949, p. 146, pl. 28, figs 9–12 from the Lower Permian Copacabana Group of Peru.

Diagnosis.—Small turbinate pleurotomoriids with a moderately acute spire and a rounded anomphalous base; a peripheral, concave selenizone lies below centre of the whorl and is bounded by carinae; a concave zone is present below selenizone; sutures impressed and lying below selenizone at a distance about equal to the selenizone width; aperture rounded.

Discussion.—The familial classification of the pleurotomariids is under review and that presented above follows the Treatise (Moore, 1960). Dickins (1961) has a full discussion of the genus noting the distinguishing features between *Peruvispira* and *Ptychomphalina*, and *Mourlonia* and *Neilsonia*.

Range and Distribution.—Within Australia the genus is widespread. Fletcher (1958) records it from the Dalwood, Shoalhaven and Maitland Groups in New South Wales; Banks (in Spry and Banks, 1962) has found the genus in the Quamby and Golden Valley Groups in Tasmania; Dickins (1957, 1963) records the genus from the Lyons Group and Fossil Cliff Formation respectively in Western Australia. These stratigraphic horizons are of Permian age.

P. kuttungensis Campbell, 1961 from the Issacs and Booral Formations and *P. kempseyensis* Campbell, 1962 from the upper horizon of the Kullatine Series in New South Wales are Westphalian in age. Maxwell (1964) records the previous two species as *Montospira* from the Middle Carboniferous of the Yarrol Basin, Queensland.

Dickins (in Veevers *et al.,* 1964 and Dickins *et al.,* 1964) has found the genus previously in the Permian of Queensland. Waterhouse (1963*b*) records it from the Permian of New Zealand.

Peruvispira parva, sp. nov.

(Fig. 1)

Holotype.—F. 43401 from the Buffel Formation, Cracow, Queensland; L. 2575, 32128451, Par. Cracow, Co. Dawson, at the base of the ridge, half a mile north-west of "Cracow", six miles south of Cracow, Queensland.

Diagnosis.—Small, turbinate *Peruvispira* with a length/width ratio approaching unity; apical angle acute; concave area below the selenizone increases in width with each successive whorl.

Description.—The shells are thick, turbinate and anomphalous with an apical angle between 49 and 57 degrees. Four whorls are developed although in some cases five may be present. The upper whorl surface is slightly convex at all stages but not as convex as the lower surface. A concave peripheral selenizone is present, being bounded on both sides by a carina with the lower one forming the periphery of the shell. On the body whorl the selenizone is 0·8 mm. wide. Sutures are not deeply impressed, lying a short distance below the lower carina. This distance is very small in early apical whorls but increases with each successive whorl. The concave area below the selenizone is best studied on the body whorl where it is 0·9 mm. wide. Ornamentation of the selenizone comprises fine lamellae that are concave to the aperture. The upper whorl surface is ornamented by growth lamellae that are slightly convex to the aperture and not as fine as lamellae in the selenizone. Lamellae leave the suture at an approximate right angle and sweep back across the whorl surface away from the aperture, reaching the upper carina at an approximate angle of 50°. Ornamentation on the lower whorl surface is characteristic. Lamellae leave the lower carina and swing forward over the concave area before turning down vertically or swinging back over the revolving ridge or the base of the whorl.

1. *Peruvispira parva* sp. nov., apertural view of F. 43401 from L. 2575, approx. × 5.

Remarks.—*Peruvispira elegans* (Fletcher) has a smaller apical angle and more whorls than *Peruvispira parva*; *P. allandalensis* (Fletcher) and *P. trifilata* (Dana) have a different length/width ratio.

Peruvispira imbricata Waterhouse, 1963*b* may be of similar size but has more whorls and a different whorl profile. The New Zealand species of the genus are usually similar in size and possess more whorls with a different profile.

Range and Distribution.—The writer has found the species only in the Buffel Formation of the Cracow District.

Localities.—In addition to the previously mentioned localities, the species is found at L. 2483, 31758603, 0·8 mile north-north-west of Rose's Pride Mine, Cracow. One specimen, F. 44306, is recorded from this locality.

Dimensions.—

	F. 43401	F. 43406	F. 43607	F. 44285
Height (mm.)	10·5	8·0	8·0	7·5
Width (mm.)	9·0	7·0	6·5	6·0
Apical angle	57°	56°	49°	53°

Family SINUOPEIDAE Wenz, 1938

Subfamily TURBONELLININAE Knight, 1960

Genus *Keeneia* Etheridge, Jr, 1902

1902, *Keeneia* Etheridge, Jr, p. 198, pl. 32, figs 1, 2; pl. 33, figs 3–5.

1958, *Keeneia* Fletcher, p. 131.

1958, *Planikeeneia* Fletcher, p. 135.

Genolectotype.—(Chosen Knight, 1941, p. 163) *Keeneia platyschismoides* Etheridge, Jr, 1902, p. 198, pl. 32, fig. 2, from the Lower Permian, Allandale Formation at Harper's Hill, 432564 Singleton 1:63,360 military map, approximately one mile north of Allandale, Hunter Valley, New South Wales.

Diagnosis.—Shells turbinate or trochiform, narrowly phaneromphalous with few whorls, flattened to slightly convex; aperture large, obliquely quadrangular; columella lip thickened with narrow insinuation in outer lip; ornamentation sharp with fine transverse lirae and pseudoselenizone.

Discussion.—The genus *Keeneia* was erected in 1902 for specimens previously referred to *Trochus oculus* (J. Sowerby) 1838, *Platyschisma ocula* Morris, 1845, Dana (1849), Johnston (1888), Etheridge, Jr, (1892) and *Euomphalous oculum* de Koninck, 1877.

Branson (1948) considered *Trochus oculus* and *Keeneia platyschismoides* to be conspecific and placed the former in the genus *Keeneia. Keeneia platyschismoides* differs from *Trochus oculus* in ornament and the shape of the periphery. Etheridge, Jr had noted differences and considered them to be of specific, not generic value.

Trochus oculus, Platyschisma ocula Morris and *Euomphalous oculus* are now placed in *Keeneia ocula* (J. Sowerby), *Platyschisma ocula* Dana is placed in *Keeneia platyschismoides* and *Platyschisma ocula* Johnston is regarded as a possible synonym of *Keeneia trochiforme* Fletcher, 1958.

Etheridge, Jr (1902) figured specimens of *Keeneia platyschismoides.* Fletcher has studied this material and is of the opinion that specimens figured in pl. 33, figs 4, 5 are not typical of *Keeneia platyschismoides.*

Following Moore (1960), *Planikeeneia,* proposed by Fletcher (1958) for depressed low-spired gastropods with whorls of low convexity is placed in synonymy with *Keeneia.*

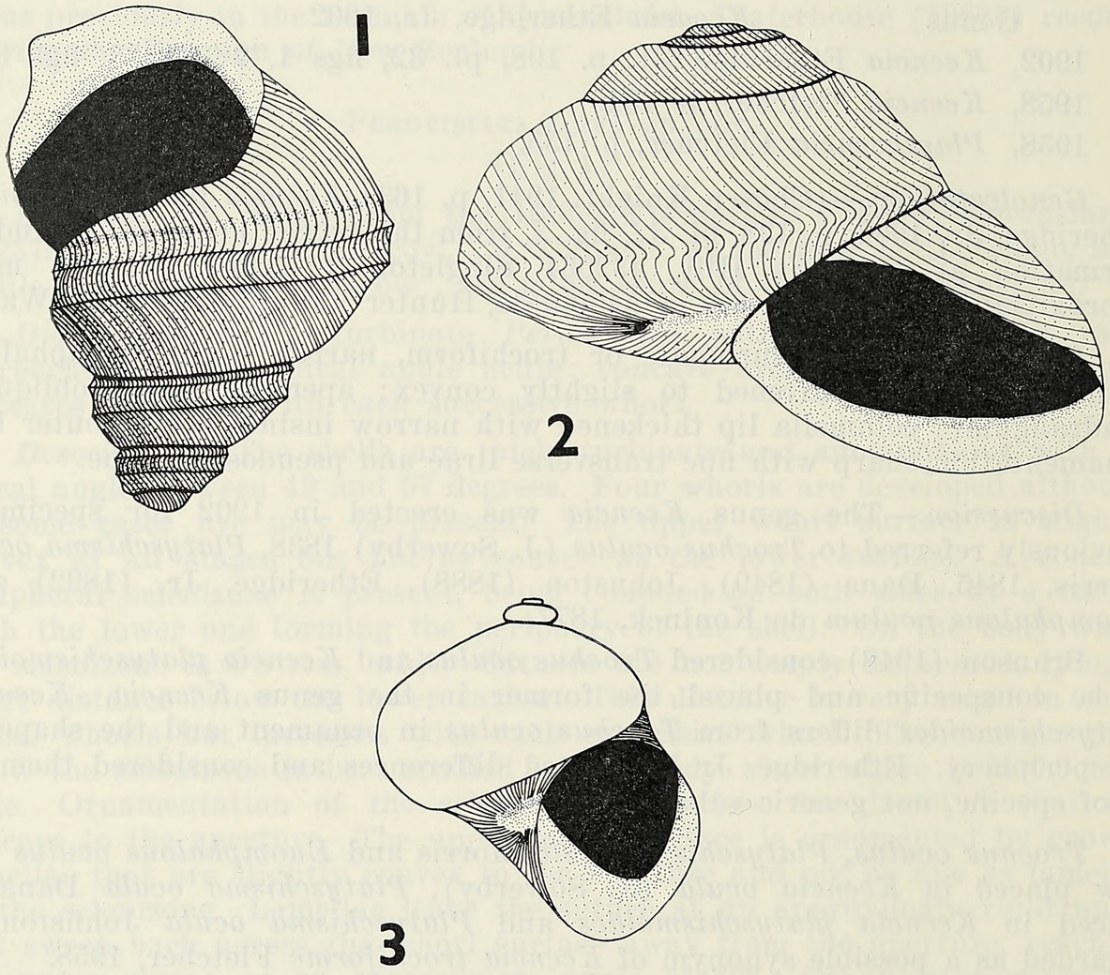
Range and Distribution.—The genus is confined to Permian strata. *Keeneia* has been recorded from the Lower Permian strata in Central India (Sahni and Dutt, 1962). It is abundant in the Dalwood Group and Branxton Formation of New South Wales (Fletcher, 1958) and in Tasmania, *K. platyschismoides* occurs in the Quamby Group and in the overlying Darlington Limestone and Brumby Formation of the Golden Valley Group (Banks, in Spry and Banks, 1962).

In Western Australia, *K. carnarvonensis* Dickins is found in the upper portion of the Lyons Group in the Carnarvon Basin (Dickins, 1963); in Queensland the genus has been recorded from the Cattle Creek Formation (Hill, 1957). Waterhouse (1963*a*) records the genus from the New Zealand Permian.

Keeneia afflicta, sp. nov.

(Fig. 2)

Holotype.—F. 43390 from the Buffel Formation, Cracow, Queensland; L. 2575, 32128451, Par. Cracow, Co. Dawson, at the base of the ridge, half a mile north-west of "Cracow", six miles south of Cracow, Queensland.



Diagnosis.—Small *Keeneia* with a very transverse whorl profile and a large apical angle; whorls few, with the lower whorl quite convex.

Description.—The shells are small, low-spired, narrowly phaneromphalous and have, in general, three whorls. The whorls are much wider than they are high and are flat or of very low convexity on the upper surface. The basal whorl profile is more convex. Sutures are shallow. The periphery of the body whorl is sharply angular with a small pseudoselenizone poorly developed. The occurrence of the periphery on the lower section of the whorl profile enables the aperture to be obliquely distended. Growth lamellae are very fine and run transversely across the whorl profile. They leave the suture at an angle of approximately 75° and are slightly convex to the aperture on the upper whorl surface. In the pseudoselenizone, lamellae swing back

slightly and are gently concave to the aperture. On the lower whorl surface lamellae are concave to the aperture.

2. *Keeneia afflicta* sp. nov., apertural view of F. 43390 from L. 2575, approx. × 2.

Remarks: This species resembles *Keeneia minor* (Fletcher) from the Lower Permian, Dalwood Group of the Hunter Valley, New South Wales. However, *K. minor* has a more flattened whorl profile together with many more whorls. The lower whorl profile is more convex in *K. afflicta* than it is in *K. minor*.

Other species of *Keeneia* have a greater or smaller apical angle than *K. afflicta* and are larger.

Range and Distribution.—The species, *Keeneia afflicta,* is found only in the Buffel Formation of the Cracow District.

Localities.—In addition to the type locality, *K. afflicta* has been recorded from L. 2483, 31758603, Par. Coteeda, Co. Dawson, 0·8 mile north-north-west of Rose's Pride Mine, Cracow. Specimens found at this locality are F. 44286–44288.

Dimensions.—

	F. 43390	F. 43391
Height (mm.)	23	20
Width (mm.)	32	29
Apical angle	115°	129°

Suborder	Trochina Cox and Knight, 1960
Superfamily	Platyceratacea Hall, 1859
Family	Platyceratidae Hall, 1859
Genus	*Strotostoma* Fletcher, 1958

1958, *Strotostoma* Fletcher, p. 127.

Type Species.—(By original designation) *Strotostoma rylstonensis* Fletcher, 1958, p. 127, pl. 8, figs 7–11, pl. 9, fig. 5, from the base of the Capertee Group, 294946 Dubbo 1:253,440 military map, approximately 2 miles north-west of Rylstone, New South Wales.

Diagnosis: Moderately large naticiform gastropods, transversely produced with a low spire and a large inflated body whorl; whorl profile somewhat flattened above and below; sutures deep; aperture large, suboval to oval; surface with well defined spiral and transverse ornament. (Adapted from Fletcher, 1958.)

Discussion.—Fletcher (1958) notes how outstanding the genus is as far as form and ornament are concerned. Only two genera, *Platystoma* Conrad and *Strophostylus* Hall, show any resemblance to *Strotostoma*. The former does not have the same whorl profile and it has a closely coiled body whorl. *Strophostylus* closely resembles *Strotostoma* but has a strongly developed, twisted, plate-like fold on the columella.

Range and Distribution.—The genus is known only from the Permian Capertee, Maitland and Shoalhaven Groups in New South Wales. This is the first record of the genus outside the state.

3. *Strotostoma* sp. nov., apertural view of F. 43434 from L. 2572, approx. natural size.

STROTOSTOMA, sp. nov.

(Fig. 3)

Description.—The shells are naticiform with a large apical angle. The spire is low and the height/maximum width ratio approaches unity. Whorl profile on the three to three and a half whorls is broadly rounded. A flattened portion occurs on the upper half of the profile. Sutures are deep. The body whorl is greatly enlarged with the aperture correspondingly large, oval in outline, and situated underneath the major portion of the shell. It is not obliquely distended. Ornament consists of a lattice-like structure which can be observed only on a small part of the shell. Coarse spiral costae are cut by finer transverse costae that run convex to the apertural margin. The ornament resembles pustules in spiral rings that have fine costae between them. Spiral costae are approximately 0·05 mm. apart.

Remarks.—The position of the aperture and its lack of oblique distention separate this species from *S. rylstonensis* which also has a greater apical angle. *Strotostoma* sp. nov. resembles *S. inflata* Fletcher in the shape and position of the aperture but it is a much larger species with a different whorl profile.

Localities.—This species is found in the Barfield Formation, south-west of Cracow at L. 2572, 31698408, Par Cracow, Co. Dawson, approximately 4·0 miles south-west of "Cracow", Queensland. Specimens recorded are F. 43434–43435.

Dimensions.—

	F. 43434	F. 43435
Height (mm.)	36	29
Maximum diameter (mm.)	36	30
Apertural height (mm.)	20	
Apertural width (mm.)	17	
Apical angle	114°	114°

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