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# Ryewater, Corscombe, Dorset

[ST 513 062]–[ST 514 067]–[ST 506 064]

K.N. Page

## Introduction

The GCR site known as 'Ryewater', near Corscombe, comprises intermittent stream-bed and bank exposures in two streams near Rye Water Farm, c. 1 km north-west of the village of Corscombe in Dorset. The western 'limb' of the site is the stream section from near Redland Coppice to just north of the bridge over Rye Water Lane, and the eastern 'limb' is the stream section from near Lovelands to the confluence with the western stream, just south of the Rye Water Lane bridge (Figure 2.21). In addition, a small section of the stream that runs parallel with, and to the north-east of, Rye Water Lane is also included. These exposures of mainly the Kellaways and Oxford Clay formations were probably amongst those referred to by Wilson *et al.* (1958) as 'an occasional stream section' in an area of otherwise poor exposure but they were not specifically noted until exceptionally heavy rainstorms at the end of June 1968 flushed out the streams to leave areas of clear exposure and well-preserved fossils in the stream-bed shingle (Cope and Cox, 1970). The site includes a more-or-less permanent exposure of the Kellaways Clay Member of the Kellaways Formation and has yielded important ammonite faunas of the Lower Callovian Koenigi Zone and Subzone. Fossiliferous exposures of the underlying Upper Cornbrash are also present as well as the overlying Kellaways Sand Member and probably the lowest part of the Oxford Clay Formation.

## Description

The succession at Ryewater occupies the core of a narrow syncline as a result of which exposures of the Upper Cornbrash and Kellaways Formation repeat themselves.

Hard, shelly limestone, with bivalves including *Meleagrinnella echinata* (J. Sowerby), belonging to the Lower Cornbrash, is exposed upstream of the ford at Lovelands (c. [ST 5135 0625]), and the lower part of the overlying Upper Cornbrash, which is at least 5 m in total thickness, has been reported nearby (Page, 1988). The latter comprises sandy, nodular and bedded limestones with locally abundant specimens of the terebratulid brachiopod *Microthyridina siddingtonensis* (Walker). Traces of similar *M. siddingtonensis*-rich sandy concretions have been recorded west of Redland Coppice (c. [ST 5045 0650]). Higher levels of the Upper Cornbrash include massive beds of sandy limestone interbedded with sandstones, sometimes with limestone concretions. These can be seen in the stream bed immediately downstream of Lovelands Ford, and again immediately east of the Rye Water Lane bridge [ST 5140 0675], in Redlands Coppice [ST 5062 0643] and possibly in a faulted outcrop at [ST 5167 0676]. A fragment of the ammonite *Macrocephalites* ex gr. *terebratus* (Phillips) collected near Redlands Coppice appears to be from these levels. The highest beds of the Upper Cornbrash crop out close to the eastern side of Rye Water Lane bridge and include grey sandy clay overlain by 0.4 m of muddy sand with an abundant bivalve fauna including *Goniomya*, *Modiolus*, *Pholadomya* and *Pleuromya*, and the ammonite *Macrocephalites* ex gr. *kamptus* (S.S. Buckman).

The overlying Kellaways Clay Member of the Kellaways Formation is seen in several small exposures a short distance west of Rye Water Lane (c. [ST 512 067]–[ST 513 067]–[ST 514 066] and repeated farther west [ST 506 064]. It is represented by grey, sandy clay with one or more bands of septarian limestone concretions and has yielded the ammonite *Proplanulites* cf. *koenigi* (J. Sowerby) and a bivalve fauna including *Catinula*, *Modiolus*, *Myophorella* and *Protocardia*. The bulk of the ex-situ fauna recorded by Cope and Cox (1970), including macroconch and microconch *Proplanulites koenigi*, *Cadoceras* sp. nov. A of Callomon and Page (in Callomon *et al.*, 1989), *Chamoussetia buckmani* Callomon and Wright and *Macrocephalites lophopleurus* (S.S. Buckman), probably came from these levels.

Greyish, sandy clay with a band of harder, more calcareous lenses is exposed in the stream bank and bed around [ST 5115 0665]. They are the sandiest lithologies seen in the stream sections and probably represent the Kellaways Sand

Member. Bivalves include *Gryphaea*, *Myophorella* and *?Pholadomya* but *Sigaloceras* sp. is the only ammonite to have been recorded *in situ* (Page, 1988). Around [ST 5108 0660], c. 0.6 m of blue-grey sandy clay has yielded abundant aragonitic fossils including the bivalves *Gryphaea*, *Oxytoma*, *Thracia* and *Trautscholdia*, and ammonites including macroconch and microconch *Sigaloceras* (*Catasigaloceras*) *enodatum* (Nikitin) trans a of Callomon *et al.* (1989) (specimens figured as *Sigaloceras* (*Catasigaloceras*) sp. nov. by Page, 1991, pl. 13, figs 9,10) and rare *Cadoceras* sp. and *?Anaplanulites* sp.. This may also be part of the Kellaways Sand Member or, alternatively, part of the locally developed Mohuns Park Member (Bristow *et al.*, 1995) of the basal Oxford Clay Formation. The highest beds so far detected *in situ* occur at around [ST 5100 0655] and may also belong to the Mohuns Park Member. They are grey clays, silty in part, with harder, more calcareous lenses containing crushed ammonites including macroconch and microconch *Kosmoceras* (*Gulielmiceras*) *medea* Callomon and *?Homoeoplanulites* sp.. A band of *Gryphaea* is present in one of the exposures and other bivalves (including *Pinna*) are also recorded. The Kellaways Formation is probably at least 20 m thick here.

## Interpretation

By comparison with former sections recorded near Corscombe, the Lower Cornbrash at Ryewater is assumed to be of latest Bathonian age (Discus Zone and Subzone; Douglas and Arkell, 1928; Page, 1988, 1989).

The Upper Cornbrash exposures are virtually the only ones in the region. They are of particular significance as they are close to important localities in the Corscombe district referred to by Douglas and Arkell (1928), which yielded the ammonites *Macrocephalites* cf. *jacquoti* Douvillé and the very rare basal Callovian index taxon *Keplerites* (*K.*) *kepleri* (Oppel). This fauna indicates the internationally important *Keplerites kepleri* Biohorizon that is used to correlate the base of the Callovian Stage from the Caucasus through Europe to east Greenland, and which is also recognizable in southern Alaska, British Columbia and possibly Japan (Callomon, 1994). The records of this fauna in the Corscombe area suggest that the Ryewater GCR site may include one of the most complete Bathonian–Callovian stage boundary successions in Britain. The site is also only c. 6 km from the sections at Sutton Bingham described by Arkell (1954a) and used by Callomon (1964) to define the base of the *Macrocephalus* (now *Herveyi*) Zone and therefore the base of the Callovian Stage. The Corscombe sections are probably stratigraphically more complete than those at Sutton Bingham, where the lower part of the Upper Cornbrash yielded the ammonite *Macrocephalites verus* S.S. Buckman (index taxon of the second oldest Callovian ammonite biohorizon), although more work is required to obtain in-situ age diagnostic specimens. The brachiopod *Microthyridina siddingtonensis* characterizes the *siddingtonensis* Biozone of Douglas and Arkell (1928), which corresponds approximately with the *Kepleri* Subzone (Lower Callovian *Herveyi* Zone) (Page, 1988, 1989).

The presence of the ammonite *Macrocephalites* ex gr. *terebratus* near Redlands Coppice indicates the *Terebratus* Subzone of the latter zone (Page, 1988). The sandy lithologies recorded at the top of the Upper Cornbrash at the Ryewater GCR site have been noted elsewhere in the district (e.g. Rampisham; Page, 1988). The presence of *Macrocephalites* ex gr. *kamptus* in these highest sandy beds suggests the *Kamptus* Subzone (youngest subzone of the *Herveyi* Zone).

The exposure of the overlying Kellaways Clay Member is particularly significant; nowhere else is a fossiliferous sequence now exposed more-or-less permanently; the type section of the member, designated by Page (1989), is a cored borehole near Kellaways in Wiltshire (see Kellaways West Tytherton GCR site report, this volume). The recorded ammonite fauna is indicative of the *Koenigi* Zone, *Gowerianus* Subzone and certainly includes elements of the *Keplerites metorchus* Biohorizon. This fauna is of particular biostratigraphical significance because it includes probable chorotypes (i.e. specimens from a neighbouring locality but at a similar stratigraphical level to the holotype) of the zonal index ammonite *Proplanulites koenigi* (J. Sowerby) (Figure 2.22). The type locality of the species is likely to have been the now obliterated hrickpit near Rampisham, c. 6 km to the south-east (Page, 1988).

The sandiest bed in the stream sections is assigned to the Kellaways Sand Member. The single *Sigaloceras* fragment recorded from it suggests the *Calloviense* Zone and Subzone. This may be confirmed by a loose specimen of *Proplanulites* ex gr. *petrosus* (S.S. Buckman)–*crassicosta* (S.S. Buckman) in a sandy matrix (originally reported by Cope

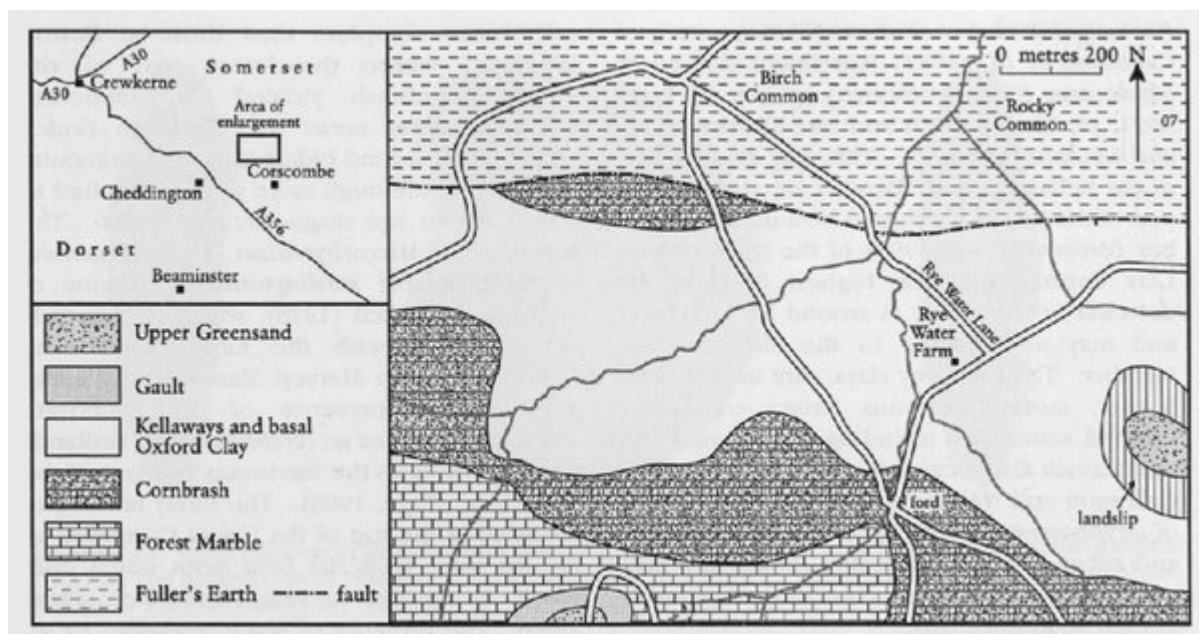
and Cox (1970) as *Reineckeia rehmanni* (Oppel)).

The ammonite fauna recorded from the topmost part of the Kellaways Sand Member (beds that might belong instead to the Mohuns Park Member of the basal Oxford Clay Formation) indicates the *Sigaloceras enodatum* Biohorizon of the Calloviense Zone, Enodatum Subzone. The highest beds exposed, with their fauna of *Kosmoceras medea* and *?Homoeoplanulites*, belong to the Middle Callovian Jason Zone, Medea Subzone.

## Conclusions

The outcrops in the stream beds and banks near Rye Water Lane, Corscombe which comprise the Ryewater GCR site, provide the best more-or-less permanent exposure of the Kellaways Clay Member of the Kellaways Formation in Britain. The member there yields the only in-situ ammonite fauna of the Lower Callovian Koenigi Zone, Gowerianus Subzone in England. Associated exposures of the Upper Cornbrash and ?basal Oxford Clay Formation also yield stratigraphically important faunas, and together these may comprise one of the most complete Bathonian–Callovian stage boundary successions in Britain. The ammonite faunas collected from the site can be related to those, including type material, from old, now obliterated exposures in the area that are recorded in the literature. These ammonite faunas are important for international correlations of the Lower Callovian Substage.

## References



(Figure 2.21) Sketch map of the Ryewater GCR site. (After Cope and Cox, 1970, fig. 2.) According to Page (1988), the Cornbrash Formation also crops out in the stream just north of Rye Water Lane.)



(Figure 2.22) Type specimen of *Proplanulites koenigi* (J. Sowerby), chorotypes of which occur at the Ryewater GCR site; The Natural History Museum, London, specimen No. 43891C). The specimen is shown at natural size. (Photo: © The Natural History Museum.)