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The PRESIDENT announced that the following candidates had been declared by the Council to be elected Fellows of the Society in accordance with Bye-law 12: Zulfiqar Aziz, Henry John Gamble, Peter Garrett, Anthony Leonard Harris, Michael Hornung, Robert Kirby, Brian Edward Lock, Paul Augustine Pittham, Albert Keith Martin Rainbow, Donald Edward Shuker.

The PRESIDENT announced that the following candidates had been admitted by the Council as Junior Associates: Judith Ann Fletcher, Christopher John Freeman.

Demonstration: Ordovician faunas from Ny Friesland, north-central Spitsbergen

H. B. Whittington, D.SC. PH.D. A.M. F.G.S.

The fossils described were first discovered by G. Vallance on the Cambridge Spitsbergen Expedition 1965 and collected in 1967 by G. Vallance and R. A. Fortey (1968), from limestones of the Oslobreen Group. They constitute by far the richest and best-preserved collections from the Ordovician system in Spitsbergen and in lithological facies different from the strata previously known lower in the succession. They include graptolites in relief (first Spitsbergen record), trilobites, brachiopods, mollusca, and rare echinoderm fragments. The trilobites are like those from the St George Formation, Upper Canadian, and the overlying Table Head Formation, Whiterock Stage, of western Newfoundland; the higher faunas thus represent the youngest Ordovician so far recognized in Spitsbergen. The faunas are like those from North America, Greenland and Ellesmereland, and are not closely related to those of similar age in England and Wales.

Reference

VALLANCE, G. & FORTEY, R. A. 1968. An Ordovician succession in north Spitsbergen. *Proc. geol. Soc. Lond.* no. 1648, pp. 91–97. [Later in this *Proceedings*.]

Demonstration: The type-section of the Volgian stage (Upper Jurassic) at Gorodische, near Ulyanovsk, USSR

R. Casey, PH.D. F.G.S.

This demonstration is a sequel to the Short Communication given by the author to the Society earlier in 1967 on the position of the Middle Volgian in the English Jurassic (*Proc. geol. Soc. Lond.* 1967, no. 1640, 128–133), an opportunity to visit the type-section of the Volgian Stage having been provided during the International Symposium on the Upper Jurassic held in June 1967 in the USSR. The classic sections in the Moscow region having largely disappeared under urban growth, the best sections of the Volgian Stage are now found in the middle reaches of the river Volga, notably near the village of Gorodische, on the right bank of the river, some 25 km above Ulyanovsk (formerly Simbirsk). Barely 35 ft thick, the Volgian Stage here consists of clays, marls, and glauconitic sands with seams of phosphatic nodules, resting conformably on clays of the Upper Kimmeridgian and followed disconformably by Lower Cretaceous deposits of Hauterivian age. A series of colour-transparencies, taken on the occasion of the Symposium's visit to Gorodische, highlighted the salient stratigraphical features and attempted to recapture the spirit of lively debate that

centred on the author's thesis that the type Volgian was not only highly condensed but also seriously incomplete. From his study of the Gorodische section the author was of the opinion that the position of the so-called 'nikitini' Zone at the top of the Middle Volgian should be re-examined. With regard to the great similarity between ammonites from this Zone and the uppermost Portlandian-basal Spilsby Sandstone *Paracraspedites* (not apparent from the literature), it now seems likely that the stratigraphical hiatus postulated by the author does not embrace the same span of time at Gorodische as in the Moscow basin. Investigation of this possibility is now progressing in collaboration with Soviet colleagues.

DISCUSSION

Dr D. V. AGER commented that he had been with Dr Casey at Gorodische and had been very convinced by his demonstration in the field, though the speaker was always amazed at the confidence with which different ammonite specialists attributed the same specimen to different species, genera, or even (as in this case) to different families. However, the particular point the speaker wanted to make was that this section, excellent though it was in some respects, exemplified the futility of the stratotype concept favoured by many continental geologists and now even blessed by UNESCO. If the speaker wanted to demonstrate to students a condensed succession, full of breaks, he could not think of anywhere better to take them than Gorodische. He was further convinced of the wisdom of this Society, as expressed in its Provisional Code of Stratigraphical Nomenclature, in wishing to define only the bases of stratigraphical divisions. We could use the Gorodische section to define the base of the Volgian Stage, since this would fall in a continuous clay sequence with rich ammonite faunas, but we should not think that any section, and certainly not Gorodische, could define the whole of the stage. If Dr Casey could convince the rest of the Jurassic world of the accuracy of his correlations there might be a case for retaining a Portlandian Stage above the Volgian, with its base defined at the bottom of the Portland Beds on the Dorset coast.

Replying to Dr Ager, the AUTHOR expressed his agreement concerning the disadvantages of the 'stratotype concept'. It was a corollary to the author's revised correlation that the Volgian Stage now had a greatly extended time-span, the greater part of our Portland Beds being not equivalent to part of the Volgian, but something to be added to the middle portion of that stage. He believed that there was room for both a Portlandian and a Volgian Stage and had proposed that (1) the Volgian Stage should be retained only for strata at present grouped as Upper Volgian; (2) the Portlandian Stage should be defined as commencing with the *Pavlovia* Zones (base of the Crushed Ammonoid Shales of Dorset), ranging upwards to the boundary with the Volgian as defined in (1), thus embracing the Middle Volgian of current usage and the whole of the Portland Beds; and (3) strata at present grouped as Lower Volgian should be assigned to the Kimmeridgian, thus effecting a compromise between the Kimmeridgian *sensu anglico* and the Kimmeridgian *sensu gallico*.

The consolidation of clays by gravitational compaction

A. W. Skempton, D.S.C. F.R.S. F.G.S.

Sedimentation compression curves, relating void ratio to effective overburden pressure, are presented for a wide lithological range of clays. These curves show progressive changes from recently deposited muds on the sea floor, to soft or firm Holocene clays at depths of several metres or tens of metres, and finally