## **Contents**

Preface	vii	Lithofacies C3: hummocky cross stratified sandstone	45
		Facies analysis and palaeoenvironments	46
Acknowledgements	viii	Lithofacies Association A: alluvial fan sedimentation	46
Chapter 1 Overview and biostratigraphy	1	Lithofacies Association B: braided stream sedimentation	48
Opening remarks and objectives	1	Lithofacies Association C: transgressive marine	48
The Cambrian geology of Pembrokeshire	3	sedimentation	4.0
Physiography, nature of exposure and access	3	St Non's Formation	49
History of research	3	Caerfai Bay Formation	51
Structure	3	Caer Bwdy Bay Formation	53
		Newgale Formation (new)	55
Regional geological context	7	Lithofacies Association NA	55
Definition of the Cambrian and its subdivisions	9	Lithofacies NA1: unstratified, tabular, non-erosive	55
Cambrian biostratigraphy in SW Wales	11	pebbly sandstone	
Terreneuvian Series	11	Lithofacies NA2: unstratified, lenticular pebbly sandstone	55
Unnamed Cambrian Series 2	12	Lithofacies Association NB	£0
Unnamed Cambrian Series 3	12		58
CS5: oelandicus Biosuperzone	12	Lithofacies NB1: wavy and flaser bedded silty mudstone	58
CS5: gibbus Biozone	12	Lithofacies NB2: unstratified lenticular sandstone	58
Drumian: fissus Biozone	13	Lithofacies NB3: unstratified tabular sandstone	62
Drumian: parvifrons Biozone	13		62
Drumian: punctuosus Biozone	13	Lithefacies NB4: muddy diamictite	
Guzhangian Stage: pisiformis Biozone	13	Lithofacies NB5: massive to normally graded, crudely stratified pebbly sandstone	63
Furongian Series	13	Lithofacies NB6: microlaminated, weakly bioturbated	64
List of fossiliferous localities and faunal summaries	13	mudstone and siltstone	01
Trwyncynddeiriog	15	Trwyncynddeiriog Member (new)	65
Point St John-Porth Cadnaw, Ramsay Sound	15	Pen-y-Cyfrwy Member (new)	66
Dwrhyd	15	Cwm Mawr Member (new)	66
Penpleidiau headland, Caerfai Bay	20	Porth Clais Formation (new)	66
Ogof Eynon	26	Lithofacies PC1: massive to normally graded, crudely	68
Solva Harbour	26	stratified pebbly sandstone	00
Porth-y-rhaw	26	Lithofacies PC2: inverse to normal and inversely	68
References	28	graded unstratified sandstone	
Chapter 2 Lithostratigraphy and palaeoenvironments	33	Lithofacies PC3: graded sandstone with hummocky cross stratification and climbing	69
of the Cambrian in SW Wales	33	ripple lamination	70
Caerfai Group (revised)	33	Lithofacies PC4: graded, stratified tabular sandstone	70
Ogof Golchfa Formation (new)	35	Lithofacies PC5: weakly graded, bioturbated silty mudstone	71
Lithofacies Association A	37	Facies analysis and palaeoenvironments	71
Lithofacies A1: unstratified, tabular, clast-supported	37	Porth-y-rhaw Group (new)	72
conglomerate	31	Whitesands Bay Formation (new)	72
Lithofacies A2: muddy matrix-supported conglomerate	37	- · · · · · · · · · · · · · · · · · · ·	73
Lithofacies A3: unstratified, lenticular sand-matrix-	37	Menevia Formation (new)	
supported conglomerate and pebbly sandstone		Lithofacies M2: homogeneous silts; mudstone with	75 75
Lithofacies A4: purple and red silty mudstone	39	Lithofacies M2: homogeneous silty mudstone with discontinuous limestone	13
Lithofacies Association B	40	Lithofacies M3: graded and banded siltstone and black	75
Lithofacies B1: graded pebble conglomerate	40	mudstone	7.5
Lithofacies B2: stratified pebble conglomerate and pebbly sandstone	42	Lithofacies M4: laminated black mudstone	77 70
Lithofacies B3: stratified lenticular sandstone and	42	Aber Llong Formation (new)	78
massive silty mudstone		Ogof Velvet Formation (revised)	80
Lithofacies Association C	42	Lithofacies Association OVA	80
Lithofacies C1: well-segregated pebble conglomerate and coarse sandstone	42	Lithofacies OVA1: rippled siltstone and sandstone with interbedded mudstone	80
Lithofacies C2: trough cross-stratified coarse-grained	44	Lithofacies OVA2: siltstone-filled gutter casts	82
sandstone		Lithofacies OVA3: amalgamated lenticular sandstone	84

vi CONTENTS

Lithofacies Association OVB	85	Sequence 4	106
Lithofacies OVB1: sheet-like amalgamated sandstone	85	Sequence 5	109
Lithofacies OVB2: thinly-bedded sandstone and shale	85	Sequence 6	109
Lithofacies OVB3: sandstone and mudstone with soft- sediment deformation	86	Sequence 7 Sequence 8	112 113
Lithofacies Association OVC	87	Tectonostratigraphy, provenance and basin analysis	116
Lithofacies OVC1: tabular graded fine-very fine sandstone	87	Megasequence 1 (sequences 1–7)	118
Lithofacies OVC2: structureless silty mudstone	87	General remarks	118
Facies analysis and palaeoenvironments	88	The lower part of the Caerfai Group: tectonosedimentary model and basin margin	120
Treffgarne Bridge Formation	90	evolution	
References	91	The extensional regime	124
Chapter 3 Sequence stratigraphy, tectonostratigraphy and basin analysis	101	Implications for the late Neoproterozoic – Cambrian tectonostratigraphic evolution of East Avalonia	124
Geological and stratigraphical setting	101	Megasequence 2 (Sequence 8)	125
Sequence stratigraphy	102	References	128
Depositional sequences	106		
Sequence 3	106	Index	135