

Contents

List of Reviewers	ix
Introductory chapters	
ARNAUD, E., HALVERSON, G. P. & SHIELDS-ZHOU, G. The geological record of Neoproterozoic ice ages	1
HOFFMAN, P. F. A history of Neoproterozoic glacial geology, 1871–1997	17
ARNAUD, E. & ETIENNE, J. L. Recognition of glacial influence in Neoproterozoic sedimentary successions	39
HALVERSON, G. P. & SHIELDS-ZHOU, G. Chemostratigraphy and the Neoproterozoic glaciations	51
HOFFMAN, P. F., MACDONALD, F. A. & HALVERSON, G. P. Chemical sediments associated with Neoproterozoic glaciation: iron formation, cap carbonate, barite and phosphorite	67
BAHLBURG, H. & DOBRZINSKI, N. A review of the Chemical Index of Alteration (CIA) and its application to the study of Neoproterozoic glacial deposits and climate transitions	81
EVANS, D. A. D. & RAUB, T. D. Neoproterozoic glacial palaeolatitudes: a global update	93
GREY, K., HILL, A. C. & CALVER, C. Biostratigraphy and stratigraphic subdivision of Cryogenian successions of Australia in a global context	113
CONDON, D. J. & BOWRING, S. A. A user's guide to Neoproterozoic geochronology	135
GODDÉRIIS, Y., LE HIR, G. & DONNADIEU, Y. Modelling the Snowball Earth	151
Africa	
SHIELDS-ZHOU, G. A., DEYNOUX, M. & OCH, L. The record of Neoproterozoic glaciation in the Taoudéni Basin, NW Africa	163
MASTER, S. & WENDORFF, M. Neoproterozoic glaciogenic diamictites of the Katanga Supergroup, Central Africa	173
TAIT, J., DELPOMDOR, F., PRÉAT, A., TACK, L., STRAATHOF, G. & NKULA, V. K. Neoproterozoic sequences of the West Congo and Lindi/Ubangi Supergroups in the Congo Craton, Central Africa	185
HOFFMAN, P. F. Glaciogenic and associated strata of the Otavi carbonate platform and foreslope, northern Namibia: evidence for large base-level and glacioeustatic changes	195
PRAVE, A. R., HOFFMANN, K.-H., HEGENBERGER, W. & FALICK, A. E. The Witvlei Group of East-Central Namibia	211
FRIMMEL, H. E. The Chameis Gate Member, Chameis Group, Marmora Terrane, Namibia	217
FRIMMEL, H. E. The Kaigas and Numees formations, Port Nolloth Group, in South Africa and Namibia	223
FRIMMEL, H. E. The Karoetjes Kop and Bloupoort formations, Gifberg Group, South Africa	233
Eurasia–Nubian Shield	
ALLEN, P. A., RIEU, R., ETIENNE, J. L., MATTER, A. & COZZI, A. The Ayn Formation of the Mirbat Group, Dhofar, Oman	239
ALLEN, P. A., LEATHER, J., BRASIER, M. D., RIEU, R., MCCARRON, M., LE GUERROUÉ, E., ETIENNE, J. L. & COZZI, A. The Abu Mahara Group (Ghubrah and Fiq formations), Jabal Akhdar, Oman	251
MILLER, N. R., AVIGAD, D., STERN, R. J. & BEYTH, M. The Tambien Group, Northern Ethiopia (Tigre)	263
STERN, R. J., JOHNSON, P. R., ALI, K. A. & MUKHERJEE, S. K. Evidence for Early and Mid-Cryogenian glaciation in the Northern Arabian–Nubian Shield (Egypt, Sudan, and western Arabia)	277
CHUMAKOV, N. M. Glacial deposits of the Bokson Group, East Sayan Mountains, Buryatian Republic, Russian Federation	285
CHUMAKOV, N. M. The Neoproterozoic glacial formations of the North and Middle Urals	289

CHUMAKOV, N. M. Glacial deposits of the Nichatka Formation, Chara River basin and review of Upper Precambrian diamictites of Central Siberia	297
CHUMAKOV, N. M. Glacial deposits of the Baykonur Formation, Kazakhstan and Kyrgyzstan	303
CHUMAKOV, N. M., POKROVSKY, B. G. & MELEZHNIK, V. A. The glaciogenic Bol'shoi Patom Formation, Lena River, central Siberia	309
SOVETOV, J. K. Late Cryogenian (Vendian) glaciogenic deposits in the Marnya Formation, Oselok Group, in the foothills of the East Sayan Range, southwestern Siberian Craton	317
MACDONALD, F. A. The Tsagaan Oloom Formation, southwestern Mongolia	331
MACDONALD, F. A. & JONES, D. S. The Khubsugul Group, Northern Mongolia	339
ETIENNE, J. L., ALLEN, P. A., LE GUERROUÉ, E., HEAMAN, L., GHOSH, S. K. & ISLAM, R. The Blaini Formation of the Lesser Himalaya, NW India	347
ZHANG, Q.-R., CHU, X.-L. & FENG, L.-J. Neoproterozoic glacial records in the Yangtze Region, China	357
ZHU, M. & WANG, H. Neoproterozoic glaciogenic diamictites of the Tarim Block, NW China	367
North America	
MACDONALD, F. A. The Hula Hula Diamictite and Katakaturuk Dolomite, Arctic Alaska	379
MACDONALD, F. A. & COHEN, P. A. The Tatonduk inlier, Alaska–Yukon border	389
HOFFMAN, P. F. & HALVERSON, G. P. Neoproterozoic glacial record in the Mackenzie Mountains, northern Canadian Cordillera	397
SMITH, M. D., ARNAUD, E., ARNOTT, R. W. C. & ROSS, G. M. The record of Neoproterozoic glaciations in the Windermere Supergroup, southern Canadian Cordillera	413
LINK, P. K. & CHRISTIE-BLICK, N. Neoproterozoic strata of southeastern Idaho and Utah: record of Cryogenian rifting and glaciation	425
LUND, K., ALEINIKOFF, J. N. & EVANS, K. V. The Edwardsburg Formation and related rocks, Windermere Supergroup, central Idaho, USA	437
MROFKA, D. & KENNEDY, M. The Kingston Peak Formation in the eastern Death Valley region	449
PETTERSON, R., PRAVE, A. R. & WERNICKE, B. P. Glaciogenic and related strata of the Neoproterozoic Kingston Peak Formation in the Panamint Range, Death Valley region, California	459
CARTO, S. L. & EYLES, N. The deep-marine glaciogenic Gaskiers Formation, Newfoundland, Canada	467
CARTO, S. L. & EYLES, N. The Squantum Member of the Boston Basin, Massachusetts, USA	475
South America	
CHEW, D. & KIRKLAND, C. The Chiquerío Formation, southern Peru	481
ALVARENGA, C. J. S., BOGGIANI, P. C., BABINSKI, M., DARDENNE, M. A., FIGUEIREDO, M. F., DANTAS, E. L., UHLEIN, A., SANTOS, R. V., SIAL, A. N. & TROMPETTE, R. Glacially influenced sedimentation of the Puga Formation, Cuiabá Group and Jacadigo Group, and associated carbonates of the Araras and Corumbá groups, Paraguay Belt, Brazil	487
FIGUEIREDO, M. F., BABINSKI, M. & ALVARENGA, C. J. S. The Serra Azul Formation, Paraguay Belt, Brazil	499
GUIMARÃES, J. T., MISI, A., PEDREIRA, A. J. & DOMINGUEZ, J. M. L. The Bebedouro Formation, Una Group, Bahia (Brazil)	503
MISI, A., KAUFMAN, A. J., AZMY, K., DARDENNE, M. A., SIAL, A. N. & DE OLIVEIRA, T. F. Neoproterozoic successions of the São Francisco Craton, Brazil: the Bambuí, Una, Vazante and Vaza Barris/Miaba groups and their glaciogenic deposits	509
PEDROSA-SOARES, A. C., BABINSKI, M., NOCE, C., MARTINS, M., QUEIROGA, G. & VILELA, F. The Neoproterozoic Macaúbas Group, Araçuaí orogen, SE Brazil	523
ROCHA-CAMPOS, A. C., DE BRITO NEVES, B. B., BABINSKI, M., DOS SANTOS, P. R., DE OLIVEIRA, S. M. B. & ROMANO, A. Moema laminites: a newly recognized Neoproterozoic (?) glaciogenic unit, São Francisco Basin, Brazil	535

UHLEIN, A., ALVARENGA, C. J. S., DARDENNE, M. A. & TROMPETTE, R. R. The glaciogenic Jequitáí Formation, southeastern Brazil	541
PAZOS, P. J., RAPALINI, A. E., BETTUCCI, L. S. & TÓFALO, O. R. The Playa Hermosa Formation, Playa Verde Basin, Uruguay	547
PECOITS, E., GINGRAS, M. K. & KONHAUSER, K. O. Las Ventanas and San Carlos formations, Maldonado Group, Uruguay	555
PAZOS, P. J. & RAPALINI, A. The controversial stratigraphy of the glacial deposits in the Tandilia System, Argentina	565
Europe	
HALVERSON, G. P. Glacial sediments and associated strata of the Polarisbreen Group, northeastern Svalbard	571
STOUGE, S., CHRISTIANSEN, J. L., HARPER, D. A. T., HOUMARK-NIELSEN, M., KRISTIANSEN, K., MACNIOCAILL, C. & BUCHARDT-WESTERGÅRD, B. Neoproterozoic (Cryogenian–Ediacaran) deposits in East and North-East Greenland	581
RICE, A. H. N., EDWARDS, M. B., HANSEN, T. A., ARNAUD, E. & HALVERSON, G. P. Glaciogenic rocks of the Neoproterozoic Smalfjord and Mortensnes formations, Vestertana Group, E. Finnmark, Norway	593
STODT, F., RICE, A. H. N., BJÖRKLUND, L., BAX, G., HALVERSON, G. P. & PHARAOH, T. C. Evidence of late Neoproterozoic glaciation in the Caledonides of NW Scandinavia	603
NYSTUEN, J. P. & LAMMINEN, J. T. Neoproterozoic glaciation of South Norway: from continental interior to rift and pericratonic basins in western Baltica	613
KUMPULAINEN, R. A. & GREILING, R. O. Evidence for late Neoproterozoic glaciation in the central Scandinavian Caledonides	623
KUMPULAINEN, R. A. The Neoproterozoic glaciogenic Lillfjället Formation, southern Swedish Caledonides	629
ARNAUD, E. & FAIRCHILD, I. J. The Port Askaig Formation, Dalradian Supergroup, Scotland	635
PRAVE, A. R. & FALICK, A. E. The Neoproterozoic glaciogenic deposits of Scotland and Ireland	643
Australia	
CALVER, C. R. Neoproterozoic glacial deposits of Tasmania	649
CORKERON, M. Neoproterozoic glacial deposits of the Kimberly Region and northwestern Northern Territory, Australia	659
GOSTIN, V. A., MCKIRDY, D. M., WEBSTER, L. J. & WILLIAMS, G. E. Mid-Ediacaran ice-rafting in the Adelaide Geosyncline and Officer Basin, South Australia	673
HILL, A. C., HAINES, P. W. & GREY, K. Neoproterozoic glacial deposits of central Australia	677
JENKINS, R. J. F. Billy Springs glaciation, South Australia	693
PREISS, W. V., GOSTIN, V. A., MCKIRDY, D. M., ASHLEY, P. M., WILLIAMS, G. E. & SCHMIDT, P. W. The glacial succession of Sturtian age in South Australia: the Yudnamutana Subgroup	701
WILLIAMS, G. E., GOSTIN, V. A., MCKIRDY, D. M., PREISS, W. V. & SCHMIDT, P. W. The Elatina glaciation (late Cryogenian), South Australia	713
Index	723