



# International Commission on Stratigraphy

## Subcommission on Cambrian Stratigraphy

### ANNUAL REPORT 2019

#### 1. TITLE OF CONSTITUENT BODY

##### International Subcommission on Cambrian Stratigraphy

*Prepared by:* Prof. Per AHLBERG, Secretary, per.ahlberg@geol.lu.se  
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#### 2. OVERALL OBJECTIVES AND FIT WITHIN IUGS SCIENCE POLICY

##### 2.a. Mission Statement

The Subcommission is the primary body for facilitation of international communication and scientific cooperation on Cambrian stratigraphy.

##### 2.b. Goals

The two principal goals of the Subcommission are:

- 1) To develop a global stage-level and series-level chronostratigraphic classification of the Cambrian System.
- 2) To complete and publish regional and global correlation charts for the Cambrian System.

##### 2.c. Fit within IUGS Science Policy

The objectives of the Subcommission fall within three main areas of IUGS policy:

- 1) The development of an internationally agreed scale of chronostratigraphic units, fully defined by GSSPs where appropriate (stages and series), and related to a hierarchy of units (zones) to maximize relative time resolution within the Cambrian Period.
- 2) Establishment of frameworks and systems to encourage international collaboration in understanding the evolution of the Earth during the Cambrian Period.
- 3) Working towards an international policy concerning conservation of geologically and paleontologically important sites such as GSSPs.

#### 3. ORGANISATION

##### 3.a. Interface with other international projects/groups

In July 2019, the Cambrian Subcommission held its annual meeting in association with the STRATI 2019 meeting in Milan, Italy (organized by Marco Balini and Elisabetta Erba). The *International Meeting on the Ediacaran System and the Ediacaran-Cambrian Transition (IMECT 2019)* was held in Guadalupe, Spain, 17–24 October 2019. It was a joint meeting of the Ediacaran and Cambrian subcommissions.

The Cambrian Subcommittee is involved jointly with the Ordovician Subcommittee in *IGCP Project 653: The onset of the Great Ordovician Biodiversification Event*.

The Cambrian Subcommittee is working jointly with the Ediacaran Subcommittee on restudy of the Cambrian base. Members of both subcommittees comprise the membership of the Terreneuvian/Fortunian Working Group.

### 3.b. Current officers for 2016–2020

Chair: Loren E. Babcock (USA) [babcock.5@osu.edu](mailto:babcock.5@osu.edu)

Vice-Chair: Xingliang Zhang (China) [xzhang69@nwu.edu.cn](mailto:xzhang69@nwu.edu.cn)

Secretary: Per Ahlberg (Sweden) [per.ahlberg@geol.lu.se](mailto:per.ahlberg@geol.lu.se)

## 4. EXTENT OF NATIONAL/REGIONAL/GLOBAL SUPPORT FROM SOURCES OTHER THAN IUGS

N/A

## 5. CHIEF ACCOMPLISHMENTS AND PRODUCTS IN 2019

- The GSSP for the conterminous base of the Wuliuan Stage and the Miaolingian Series at Balang, Jianhe, Guizhou, China, was ratified by the IUGS in June 2018. A paper describing the GSSP was published by Zhao et al. in 2019 (Global Standard Stratotype-Section and Point (GSSP) for the conterminous base of the Miaolingian Series and Wuliuan Stage (Cambrian) at Balang, Jianhe, Guizhou, China. *Episodes* 42, 165–184).
- The Cambrian Subcommittee held its annual meeting in association with the STRATI 2019 Meeting in Milan, Italy, 2–5 July. The Subcommittee sponsored one day-long session devoted to Cambrian geology, stratigraphy and palaeontology. Approximately 25 talks and posters were presented, including talks on the remaining stages to be defined and a keynote entitled *A Model for Subdividing Cambrian Stages into Substages* (by Babcock et al.). The meeting was followed by an excursion to the Cambrian of Sardinia, organized by Gian Luigi Pillola. A field guide book was published (*Cambrian palaeoenvironments, biotas and boundaries in southwestern Sardinia, Italy*).
- The *International Meeting on the Ediacaran System and the Ediacaran-Cambrian Transition* in Guadalupe, Spain, attracted approximately 100 researchers and included one session on the Cambrian System. Extended abstracts and field trip guides were published in *Estudios Geológicos* vol. 75, no. 2.

## 6. SUMMARY OF EXPENDITURE IN 2019

Contribution to officer's travel expenses (NAPC, Riverside, California, and STRATI 2019 in Milan, including expenditures for excursion to Sardinia)	\$ 5655.00
SUBTOTAL 2019 expenditures	\$ 5655.00
To be carried forward to 2020	\$ 1345.00

## 7. SUMMARY OF INCOME IN 2019

Carried forward from 2018	\$ 3000.00
ICS Allocation	\$ 4000.00
SUBTOTAL 2019 income	\$ 7000.00

## 8. BUDGET REQUESTS FROM ICS IN 2020

In order to accelerate the pace of work in establishing GSSPs within the Cambrian, we request a modest increase in funds from ICS as compared to previous year. This will be especially important in 2020 because of the need for Executive and Voting Members of the Subcommittee to be present at the Cambrian field conference in Siberia, which will be organized by Pavel Yu. Parkhaev, Moscow. Cambrian key sections for stages 2, 3 and 4 along the Lena and Aldan rivers will be examined. The meeting will most likely also include a visit (by helicopter from Tiksi) to the Khos-Nelege section, a potential candidate for the GSSP of Stage 10, in the Lower Lena basin northeast of Chekurovka village. Thus, at this field meeting, we will have the opportunity to examine and discuss stratigraphic issues surrounding the remaining undefined stages and the base of the Cambrian GSSP. We also request funds for supporting one officers' attendance at the IGC in Dehli in 2020.

### INCOME

Carry-over from 2019	\$ 1345.00
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### PLANNED EXPENDITURES FOR 2020

Executive and VMs travel costs, Cambrian Subcommittee meeting in Siberia	\$ 3500.00
Executives travel and accommodation, IGC, Dehli	\$ 1700.00

TOTAL 2020 PLANNED EXPENSES	\$ 5200.00
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ICS 2020 BUDGET REQUEST	\$ 3855.00
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## 9. OBJECTIVES AND WORK PLAN FOR NEXT YEAR (2020)

In 2020 the Cambrian Subcommittee will continue work toward defining GSSPs for its remaining provisional stages.

- Arrival at a decision on how to define Stage 10 in 2020 (two options: at the FAD of the agnostoid *Lotagnostus americanus* or at the FAD of the conodont *Eoconodontus notchpeakensis*); then to arrive at decisions on stages 2, 3, and 4 in subsequent years.
- Continue examining issues surrounding definition of the Cambrian GSSP.

## 10. KEY OBJECTIVES AND WORK PLAN FOR THE NEXT FOUR YEARS (2020–2024)

The principal objective of the Subcommittee for 2020 is to narrow possibilities for horizons and GSSP stratotypes for the remaining undefined stages, which are provisionally identified

as stages 2, 3, 4, and 10. The ISCS has developed a prioritized plan for formalizing definition of the remaining undefined GSSPs. The plan is:

- Provisional Stage 10 is expected to be defined next, but a decision on a GSSP is likely to be one or two years away.
- Following a decision on Stage 10, provisional stages 2, 3, and 4, are expected to be defined in rapid succession. A decision on the preferred GSSP horizon of any one of the three stages will restrict choices for the remaining two stages, so the ISCS is approaching work toward definition of the three stages as closely linked.
- A more long-term objective is re-examination of the Cambrian GSSP (Terreneu-vian Series, Fortunian Stage). Imprecision in correlating the lower boundary of the Cambrian System has been encountered on all palaeocontinents, and the ISCS is now engaged in seeking a practical solution to remedy the problem (see Babcock, L.E. et al. 2014: Proposed reassessment of the Cambrian GSSP. *J. of African Earth Sci.* 98, 3–10). A decision on how to proceed with the Cambrian GSSP is expected to be made following ratification of GSSPs for stages 2, 3, and 4.

## APPENDIX

### *Subcommission officers (2016–2020)*

*Chairman:* Loren E. Babcock (USA) [babcock.5@osu.edu](mailto:babcock.5@osu.edu)

*Vice-Chair:* Xingliang Zhang (China) [xzhang69@nwu.edu.cn](mailto:xzhang69@nwu.edu.cn)

*Secretary:* Per Ahlberg (Sweden) [per.ahlberg@geol.lu.se](mailto:per.ahlberg@geol.lu.se)

### *List of Voting Members (including officers) for 2016–2020*

- 1) Per Ahlberg, Lund, Sweden [per.ahlberg@geol.lu.se](mailto:per.ahlberg@geol.lu.se)
- 2) José-Javier Álvaro, Villeneuve d'Ascq, Spain [alvarobjj@cab.inta-csis.es](mailto:alvarobjj@cab.inta-csis.es), [jj.alvaro@csic.es](mailto:jj.alvaro@csic.es)
- 3) Loren E. Babcock, Columbus, Ohio, USA [babcock.5@osu.edu](mailto:babcock.5@osu.edu)
- 4) Gabriella Bagnoli, Pisa, Italy [bagnoli@dst.unipi.it](mailto:bagnoli@dst.unipi.it)
- 5) Duck K. Choi, Seoul, Korea [dkchoi@snu.ac.kr](mailto:dkchoi@snu.ac.kr)
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- 9) James B. Jago, Mawson Lakes, Australia [jim.jago@unisa.edu.au](mailto:jim.jago@unisa.edu.au)
- 10) Pierre D. Kruse, Adelaide, Australia [archaeo.kruse@gmail.com](mailto:archaeo.kruse@gmail.com)
- 11) Linda B. McCollum, Cheney, Washington, USA [lmccollum@ewu.edu](mailto:lmccollum@ewu.edu)
- 12) Malgorzata Moczydlowska-Vidal, Sweden [malgo.vidal@pal.uu.se](mailto:malgo.vidal@pal.uu.se)
- 13) Elena B. Naimark, Moscow, Russia [naimark@paleo.ru](mailto:naimark@paleo.ru)
- 14) Tatyana V. Pegel, Novosibirsk, Russia [pegel@mail.ru](mailto:pegel@mail.ru)
- 15) Shanchi Peng, Nanjing, China [scpeng@nigpas.ac.cn](mailto:scpeng@nigpas.ac.cn)
- 16) Leonid Popov, Wales, UK [leonid.popov@museumwales.ac.uk](mailto:leonid.popov@museumwales.ac.uk)
- 17) Brian R. Pratt, Saskatchewan, Canada [brian.pratt@usask.ca](mailto:brian.pratt@usask.ca)
- 18) Matthew R. Saltzman, Columbus, Ohio, USA [saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)
- 19) Michael Steiner, Berlin Germany [michael.steiner@FU-Berlin.de](mailto:michael.steiner@FU-Berlin.de)
- 20) Alexey I. Varlamov, Moscow, Russia [varlamov@vnigni.ru](mailto:varlamov@vnigni.ru), [info@vnigni.ru](mailto:info@vnigni.ru)
- 21) Mark Webster, Chicago, Illinois, USA [mwebster@geosci.uchicago.edu](mailto:mwebster@geosci.uchicago.edu)
- 22) Xingliang Zhang, Xi'an, China [xzhang69@nwu.edu.cn](mailto:xzhang69@nwu.edu.cn)
- 23) Maoyan Zhu, Nanjing, China [myzhu@nigpas.ac.cn](mailto:myzhu@nigpas.ac.cn)
- 24) Anna Zylinska, Warsaw, Poland [anna.zylinska@uw.edu.pl](mailto:anna.zylinska@uw.edu.pl)

### *List of Working (Task) Groups and their officers*

1. WG on Stage 10 GSSP, chaired by Per Ahlberg (Sweden)
2. WG on Stage 4 GSSP, chaired by James B. Jago (Australia)
3. WG on Stage 3 GSSP, chaired by Xingliang Zhang (China)
4. WG on Stage 2 GSSP, chaired by Michael Steiner (Germany)
5. Cambrian GSSP, chaired by Zhu Maoyan (China)