

INTERNATIONAL COUNCIL OF MUSEUMS

COMMITTEE ON MUSEUMS AND
COLLECTIONS OF NATURAL HISTORY

WORKING GROUP ON THE ANTHROPOCENE

INITIAL REPORT: DRAFT

Emlyn Koster, PhD

Working Group Chair

Director, North Carolina Museum of Natural Sciences

emlyn.koster@naturalsciences.org

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INTRODUCTION

Background

The purpose of ICOM NATHIST, as stated in Article II of its Bylaws, is to be “concerned with the scientific study of the world’s natural heritage, the conservation of biological diversity in museum collections and the education of the wider public about the natural environment by using museum facilities.” Section 6 of Article VI, Board of Directors, provides for the creation of “committees, working groups or task forces to address specific projects or activities” and that “upon Board approval, the Board Chair, with the advice of the Board members, shall appoint [their] members ... [and that] non NATHIST members may be invited to participate ... so that NATHIST may utilize their expertise.”

Mindful of the rising prominence of the Anthropocene as a transdisciplinary subject in scientific, environmental, societal and museological contexts, NATHIST announced on May 16, 2017:

At the 2017 conference, we will advance the idea of setting up an Anthropocene Working Group within ICOM NATHIST. The proposed group will be chaired by Dr. Emlyn Koster, Director of the North Carolina Museum of Natural Sciences (USA). Prospective members include Dr. Osamu Kamei (Japan) and Dr. Nicolas Kramar (Switzerland). The meeting time will be Wednesday, October 25, 4:00-5:30 p8ujm. The venue will be posted with the conference materials. All conference-goers are welcome to join us at the conference session ... where we will discuss the mission and topics such as terms of reference, potential projects or initiatives and likely outcomes. Members of ICOM NATHIST are able to join the group in an ongoing capacity. The Anthropocene, the core perspective of this conference, defines Earth’s most recent geologic time period as being human-influenced, based on global evidence that atmospheric, geologic, hydrologic, biospheric and other earth system processes are being altered by humans to the extent that our activities are altering the geological time scale. The Anthropocene working group will be formally discussed at the ICOM NATHIST Annual General Meeting and, if approved by the membership, adopted formally at that time.¹

At the start of the NATHIST Conference at the Carnegie Museum of Natural History, the Chair’s proposal to create a **Working Group on the Anthropocene** was approved at the Board Meeting on October 24. The next day’s 90-minute initial opportunity for discussion attracted approx. 30 delegates (Appendix A). This step was summarized at the NATHIST Annual Business Meeting on October 26 and noted in its Conference Report on December 30, 2017².

Approach

Reflecting the above-noted October 25 discussion, taking stock of international developments relating to the Anthropocene and across the nature-and-science museum sector, and citing major events and publications in a big-picture context, this document offers a high-level framework for review, dialogue and improvement. It summarizes the growing scholarly and public prominence of

¹ <https://icomnathist.wordpress.com/2017/05/16/new-anthropocene-working-group-proposed/>.

² <https://icomnathist.wordpress.com/2017/12/30/2017-conference-report/>.

the Anthropocene as a transdisciplinary frame of reference for anthropogenic changes to the Earth System. It acknowledges the blurring of traditional boundaries between natural history, natural sciences, science and nature, science, and science and technology museums. It recognizes that collective progress has been hindered by several factors, most notably an initially competitive atmosphere between collection-based museums and interactive science centers, still an uneven association-level infrastructure, and only recent attention on the future as much as on the past and present. It hopes that a holistic approach will enable NATHIST to optimize and communicate the scope of its **Working Group on the Anthropocene** in a way that also clarifies matters for the whole nature-and-science museum sector. Above all, NATHIST is poised to stimulate a vital conversation of how museums, as unique resources in a civil society, can best champion a cause of unprecedented urgency – namely, the future of Planet Earth and all of its life.

EVOLVING ETHOS

Introduction

Profound challenges have arisen from a quarter-century lag between the response of the scientific sector and of society-at-large to the first photos of the Earth from the Moon in the late 1960s and the response of the nature and science museum sector to a growing realization since the 1990s that it ought to be maximally relevant to pressing external needs. These challenges are compounded by *The Great Acceleration* of human-caused changes to the Earth System since the mid-20th Century and the intensifying needs since 2000 with the increasingly popular *Anthropocene* concept³.

Society and Environment

A chronology of contributory milestones is followed by excerpts from published reflections about the needed new ethos.

| | |
|---------|---|
| 1948 | Astronomer Fred Hoyle anticipates that the first photos of the Earth from space will have a transformative impact on the course of human history. |
| 1959-72 | NASA's first photos of the Earth from the distance of the Moon ... Explorer 6 in 1959; Orbiter 1 in 1966; Apollo 11, <i>One small step for man, one giant leap for mankind</i> in 1969; 'Apollo 17, famous <i>Blue Marble</i> view in 1972. |
| 1971 | First <i>Earth Day</i> celebration. ⁴ |
| 1979 | James Lovelock publishes <i>Gaia: A New Look at Life on Earth</i> . |

³ News attention on the Anthropocene intensified about a decade after the introduction of the term: e.g. A force of nature: our influential Anthropocene period, guardian.co.uk, 23 July 2009; Climate change causes new 'epoch', <http://independent.co.uk/climatechange/climate-change-causes-new-epoch-774293.html>, 26 January 2008. A man-made world, *The Economist*, 28 May 2011, 81-83; The Anthropocene, *The New York Times*, 27 February 2011, A22; Geologists press for recognition of Earth changing 'human epoch', guardian.co.uk, 3 June 2011; Anthropocene: have humans created a new geological age? <http://www.bbc.co.uk/news/science-environment-13335683>, 10 May 2011.

⁴ <https://www.earthday.org/about/>.

- 1980 Thomas Lovejoy introduces the term *biodiversity* in his book *Climate Change and Biodiversity*.
- 1987 *Sustainable development* defined by the UN Commission on Environment and Development and the launch of *Future Earth*.⁵
- 1987 Frank White publishes *The Overview Effect – Space Exploration and Human Evolution*.⁶
- 1990 Royal Society of Canada publishes *Planet under Stress: The Challenge of Global Change*.
- 1992 With approx. 1,700 signatories, Union of Concerned Scientists publishes *World Scientists' Warning to Humanity*.⁷
- 2000 Paul Crutzen advocates for the term *Anthropocene* in *The Geology of Mankind*.
- 2004 International Geosphere-Biosphere Program publishes *Global change and the Earth System: A Planet under Pressure*.⁸
- 2008 David Christian publishes *Big History: The Big Bang, Life on Earth, and the Rise of Humanity* and presents his integrated view at a TED Conference.⁹
- 2011 Nature features an editorial on *The Human Epoch*.¹⁰
- 2013 International Geosphere-Biosphere Program and Globaia Foundation release *Climate Change: The State of the Science* as a 3-minute film to unravel what IPCC climate probability ranges mean for societies.¹¹
- 2015 United Nations agree on universal Sustainable Development Goals with a 2030 deadline.¹²
- 2015 International Geosphere-Biosphere Program and Stockholm Resilience Centre issue a planetary dashboard of 24 *Great Acceleration* indicators.¹³
- 2017 With 15,000+ signatories from 184 countries, BioScience publishes *World Scientists' Warning to Humanity: Second Notice*.¹⁴
- 2018 New York Times reports that an unprecedented 70% of Americans now say that climate change is caused mainly by human activity.¹⁵
- 2018 UNESCO World Science Day for Peace and Development, *Greening the Blue*, Paris.

⁵ https://en.wikipedia.org/wiki/Future_Earth.

⁶ <http://www.overviewinstitute.org/books/item/the-overview-effect-space-exploration-and-human-evolution-second-edition>.

⁷ <https://www.ucsusa.org/sites/default/files/attach/2017/11/World%20Scientists%27%20Warning%20to%20Humanity%201992.pdf>.

⁸ *The synthesis stated that humanity was now the main driver of change at the planetary scale and that Earth is now operating in a "no analogue" state. Measurements of Earth system processes, past and present, have led to the conclusion that the planet has moved well outside the range of natural variability in the last half million years at least.* http://www.igbp.net/download/18.1b8ae20512db692f2a680007761/1376383137895/IGBP_ExecSummary_eng.pdf.

⁹ https://www.ted.com/talks/david_christian_big_history..

¹⁰ <https://www.nature.com/articles/473254a.pdf>.

¹¹ <http://www.igbp.net/multimedia/multimedia/climatechangethestateofthescience.5.30566fc6142425d6c911a08.htm>.

¹² <https://sustainabledevelopment.un.org/?menu=1300>.

¹³

<http://www.igbp.net/news/pressreleases/pressreleases/planetarydashboardshowsgreataccelerationinhumanactivitysince1950.5.950c2fa1495db7081eb42.html>.

¹⁴ <https://academic.oup.com/bioscience/article/67/12/1026/4605229>.

¹⁵ <https://www.nytimes.com/interactive/2018/02/21/climate/changed-minds-americans.html>.

*A new ethic is required—a new attitude towards discharging our responsibility for caring for ourselves and for the Earth. We must recognize the Earth's limited capacity to provide for us. We must recognize its fragility. We must no longer allow it to be ravaged. This ethic must motivate a great movement, convincing reluctant leaders and reluctant governments and reluctant peoples themselves to effect the needed changes.*¹⁶

*Surely one of the largest questions facing us all today is whether we are destined to continue ignoring an escalating agenda of 'inconvenient truths'. As the encompassing 'science of the Earth', how can geology play its maximum part in achieving the vital goal of sustainability? Geology uniquely brings big time and space perspectives to the planning table as an essential frame of reference. In his refreshing perspectives on leadership, Richard Barker summarizes Aristotle's philosophy that its purpose is 'the harmonious pursuit of positive consequences in the world'. In 1990 when the Royal Society of Canada published *Planet under Stress*, contributing physicist Ursula Franklin advocated: 'The task of the future is to build knowledge and understanding among and between citizens and scientists, so that the distinction between the two groups vanishes – so that both become citizen scientists, potentially able to solve our problems together'. Citing Franklin and others, my 1997 presidential address to the Geological Association of Canada advocated fashioning one collective view about how to chart the next chapter of the human journey.*¹⁷

*The dominant external forces influencing the rate of change of the Earth System have been astronomical and geophysical during the planet's 4.5-billion-year existence. In the last six decades, anthropogenic forcings have driven exceptionally rapid rates of change in the Earth System. This new regime can be represented by an 'Anthropocene equation', where other forcings tend to zero, and the rate of change under human influence can be estimated. Reducing the risk of leaving the glacial–interglacial limit cycle of the late Quaternary for an uncertain future will require, in the first instance, the rate of change of the Earth System to become approximately zero.*¹⁸

*The world is old beyond comprehension, and our story on it is short. The conceit of the Anthropocene, the supposed new epoch we're living in, is that humanity can already make claims to its geological legacy. But if we are to endure as a civilization, or even as a species, for anything more than what might amount to a thin layer of odd rock in some windswept canyon of the far future, some humility is in order about our, thus far, infinitesimal part in the history of the planet.*¹⁹

*In hindsight, the first mission of Apollo and the introduction of the Anthropocene should have bracketed a period of profound introspection, reflection and inspiration across the nature and science museum sector.*²⁰

¹⁶ <https://www.ucusa.org/about/1992-world-scientists.html#.Wn86mmdy7IU>.

¹⁷ Koster, E. 2011. The Anthropocene: an unprecedented opportunity to advance the unique relevance of geology to societal and environmental needs. *Geological Society of London, Geoscientist* 21/9, 18-21.

¹⁸ <http://journals.sagepub.com/doi/abs/10.1177/2053019616688022?journalCode=anra>.

¹⁹ Brannen, P., 2018. *Rambling through Time*. The New York Times, January 28.

²⁰ Koster, E. 2016. From Apollo into the Anthropocene: the odyssey of nature and science museums in an externally responsible context. In: *Museums, Ethics and Cultural Heritage*, Murphy, B. (Ed.), Routledge and International Council of Museums, 228-241.

Great Acceleration and Anthropocene

While Apollo's photos of Planet Earth were immediately iconic, it was 35 years later that the International Geosphere-Biosphere Program called attention to *The Great Acceleration* which had been exponentially unfolding²¹. The Program's 24 side-by-side graphs of 160-year Earth System and socioeconomic trends that accompany the text excerpted in the first of the following footnotes portray a compellingly urgent situation.

Many human activities reached take-off points sometime in the 20th Century and sharply accelerated towards the end of the century ... The last 60 years have without doubt seen the most profound transformation of the human relationship with the natural world in the history of humankind ... Human activities have clearly evolved from insignificance in terms of Earth system functioning to the creation of global-scale impacts that are approaching or exceeding in magnitude some of the great forces of nature; operate on much faster time scales than rates of natural variability, often by an order of magnitude or more; and taken together in terms of extent, magnitude, rate and simultaneity, have produced a no-analogue state in the dynamics and functioning of the Earth system ... Human impacts on the Earth system do not operate in separate, simple cause-effect responses. A single type of human-driven change triggers a large number of responses in the Earth system, which themselves cascade through the system, often merging with patterns of natural variability ... The responses seldom follow linear chains, but more often interact with each other, sometimes damping the effects of the original human forcing and at other times amplifying them. Responses become feedbacks, which in turn can lead to further forcings that can alter the functioning of the Earth system.

Coined by the atmospheric chemist and Nobel Prize laureate Paul J. Crutzen, the term 'Anthropocene' describes the idea of a new geological era following the Holocene that is shaped by the deep interventions into nature by humans as bio- and geological agents. As a scientific hypothesis, the Anthropocene entails the idea that the changes initiated by humans show up in geological evidence and that they have such a long-term impact that they should be recorded on the earth's history scale. Beyond this geological interpretation, the Anthropocene denotes a new framework of thinking and action, which builds a bridge between the natural sciences and the humanities and which interlinks the history of our planet and humankind with the present and future.²²

Initial consideration [of the Anthropocene] within the stratigraphic community began in 2008 by the Stratigraphy Commission of the Geological Society of London ... Based on an overview of evidence, a large majority of members of this national body agreed that the term had sufficient 'stratigraphic merit' to be considered for potential formalization ... This led to an invitation by the Subcommittee of Quaternary Stratigraphy, the relevant component body of the International Commission on Stratigraphy to establish a working group to examine the question formally ... officially designated as Working Group on the Anthropocene (AWG) ... [this] began activities in 2009 ... The AWG has already begun the process of identifying potential GSSPs [Global boundary Stratotype Section and Point] by analyzing the general environments in which the best combinations of stratigraphic signals are likely to

²¹ <http://www.igbp.net/globalchange/greatacceleration.4.1b8ae20512db692f2a680001630.html>

²² http://www.carsoncenter.uni-muenchen.de/events_conf_seminars/exhibitions/anthropocene/index.html.

be found (e.g. undisturbed lake or marine sediments, peat, annual banded coral skeletons, polar snow/ice layers, speleothems, tree rings and so on).²³

The word “anthropocene” has become the closest thing there is to common shorthand for this turbulent, momentous, unpredictable, hopeless, hopeful time – duration and scope still unknown.²⁴ The Anthropocene represents a new phase in both humankind and of the Earth, when natural forces and human forces become intertwined, so that the fate of one determines the fate of the other.²⁵

The Anthropocene has considerable geological reality. The evidence has been widely published and is now being gathered into one large book for Cambridge University Press (2018) ... The Working Group is now beginning a new proposal based, classically, in identification and selection of a GSSP or ‘golden spike’. The sharpest and most globally synchronous signal is probably the ‘bomb spike’ of artificial radionuclides released by atmospheric nuclear bomb tests [in the mid-20th Century]. These spread quickly around the world, forming a distinctive marker in all sediments everywhere ... We aim to prepare a formal proposal over the next few years.²⁶

It’s been dubbed “the loneliest tree on the planet” because of its remote location, but [this] Sitka spruce might represent something quite profound about the age in which we live. The tree, sited on Campbell Island in the Southern Ocean, records in its wood a clear radioactive trace from the A-bomb tests of the 1950s and 60s. As such, it could be the “golden spike” scientists are seeking to define the start of the Anthropocene Epoch - a new time segment in our geological history of Earth. The suggestion is that whatever is taken as the golden spike, it should reflect the so-called “Great Acceleration” when human impacts on the planet suddenly intensified and became global in extent.²⁷

Nature and Science Museums

A chronology of contributory milestones is followed by excerpts from published reflections about the needed new ethos.

- | | |
|------|--|
| 1996 | 1 st Science Centre World Congress, <i>Learning for Tomorrow</i> theme, Helsinki. |
| 1999 | 2 nd Science Centre World Congress, <i>Catalysts for a Better Tomorrow</i> theme, Calcutta. |
| 2002 | Stephen Weil, Smithsonian Emeritus Scholar, publishes <i>Making Museums Matter</i> . |
| 2002 | 3 rd Science Centre World Congress, <i>Science Centres Inspiring a New Generation</i> theme, Canberra. |
| 2005 | 4 th Science Centre World Congress, <i>Science Centres: Breaking Barriers, Engaging Citizens</i> theme, Rio de Janeiro. |

²³ Jalsiewicz, J., et al. 2017. The Working Group on the Anthropocene: summary of evidence and interim recommendations. *Anthropocene* 19, 55-60.

²⁴ <https://www.anthropocenemagazine.org/anthropocenejourney/>.

²⁵ Jalsiewicz, J., Williams, M, Steffen, W. and Crutzen, P. 2010. The new world of the Anthropocene. *Environmental Science and Technology*, 44, 2228-2231.

²⁶ <https://www.geolsoc.org.uk/Geoscientist/Archive/December-January-2017-18/The-Geological-Anthropocene>.

²⁷ <http://www.bbc.com/news/science-environment-43113900>.

- 2007 Buffon Declaration on *Natural History Museums and the Environmental Crisis*, Paris (Appendix B).
- 2008 5th Science Centre World Congress, *Science Centres as Agents of Change – Locally, Nationally and Internationally*, issues the Toronto Declaration (Attachment C).
- 2011 6th Science Centre World Congress, *Science Across Cultures* theme, issues the Cape Town Declaration (Appendix C).
- 2012 Declaration on 21st Century Learning in Natural History Settings, Washington, DC (Attachment B).
- 2013 *Collecting the Future: Museums, Communities and Climate Change*, American Museum of Natural History.
- 2014 Science Centre World Summit, *Public Engagement for a Better World*, issues the Mechelen Declaration (Appendix C).
- 2014 ICOM NATHIST conference, *The Future of Natural History Museums: Relevance, Balance and Innovation*, Croatia.
- 2014-16 *Welcome to the Anthropocene: The Earth in our Hands* exhibition, Deutsches Museum.
- 2015 ICOM NATHIST conference, *Natural History Museums: Building our Future*, Taipei, issues 'Declaration on Conservation' (Appendix B).
- 2016 UNESCO World Science Day for Peace and Development, *Celebrating Science Centers and Science Museums* theme.
- 2016 *Museums in the Anthropocene: Toward the History of Humankind within Biosphere and Technosphere*, National Museum of Nature and Science, Tokyo.
- 2017 *Earth Optimism Summit, What's working in Conservation?* Smithsonian Institution, Washington, DC.²⁸
- 2017 ICOM NATHIST conference, *The Anthropocene: Natural History Museums in the Age of Humanity*, Pittsburgh.
- 2017 Science Centre World Summit, *Connecting the World for a Sustainable Future*, issues the Tokyo Protocol (Appendix C).
- 2017 American Alliance of Museums publishes issue its magazine, titled *2040 ... explore one specific future that might result from existing limits and challenges playing out over time and imagines that ... acting together, museums can make the Anthropocene an era we can be proud of.*²⁹
- 2017-18 *We are Nature: Living in the Anthropocene*, exhibition at the Carnegie Museum of Natural History.
- 2018 ICOM NATHIST and Routledge publish *The Future of Natural History Museums*, edited by Eric Dorfman.
- 2018 Annual meeting of US-based Association of Science Museum Directors agrees that 'the impacts of the Anthropocene are dire and notes that *all of our institutions are organizing research, exhibits, programs around the topic.*
- 2018 International symposium, *Climate Change and Museums: Critical Approaches to Engagement and Management*, Manchester.³⁰

Here is a sample of benchmarks in the evolution of philosophy and practice in the nature and science museum sector, starting with a prescient one from the 1950s:

²⁸ <https://earthoptimism.si.edu/>.

²⁹ <http://www.aam-us.org/about-us/publications/museum-magazine>.

³⁰ <https://www.haw-hamburg.de/en/ftz-nk/events/museums.html>.

*... it seems evident that the natural history museum has reached a stage in the evolution of its relationship to society where the generally prevailing opportunistic vagueness of intentions is becoming a liability which must be replaced by a well-considered, well-integrated, and well-defined philosophy concerning the museum's place in the general research and educational system of the nation ...*³¹

*The Victorian paradigm for natural history museums is dead. Its successor? The ecosystem; pluralistic; interdependent – and fragile ... Most visitors have little or no tangible contact or comprehension of the ecosystem they live in and depend on.*³²

*... it is a matter of accountability whether ... institutions opt to be part of the solution or part of the problem ... Successfully heading in this direction depends on three facets of institutional culture being in place. The first concerns mission and vision—is there a clear and firm commitment to be of value to the societal and environmental problems we face? The second concerns leadership—is there a preparedness and competence to be an activist? The third concerns strategy—is there a relentless pursuit to be more externally useful and to nurture new perspectives in funding stakeholders?*³³

*... the awkward matter remains that, for a variety of reasons, the museum field has never agreed—and until recently, has scarcely even sought to agree—on some standard by which the relative worthiness of its constituent member institutions might be measured.*³⁴

*... [the] majority of museums, as social institutions, have largely eschewed on both moral and practical grounds, a broader commitment to the world in which they operate.*³⁵

*Every step taken that is neutral or contrary to the greater good makes it that much more difficult for the museum to start or regain a strengthening reputation of relevance ... At what point—before, during, after, or never—does the museum responsibly become a stage for public engagement around a challenging or controversial issue? ... Should a museum that has yet to embark on a wholehearted journey of relevance plunge abruptly into the realm of controversial subject matter, it will surely do so at its public relations peril. On the other hand, for a museum that has been proactively on a journey of increasingly relating to the important matters at hand, the majority of the audience will seldom be surprised over the latest step in its zeal to address topics of a challenging or controversial nature. Indeed a consistent profile of this nature will not only incrementally affirm the museum's chosen direction but also attract funders who increasingly seek outcomes that profoundly matter.*³⁶

An institution such as a museum has a responsibility to empower the electorate to make informed, scientifically literate decisions about their lives. If in 2050 we were delivering the same messages, either

³¹ Parr, A. 1959. Mostly about museums, New York: American Museum of Natural History.

³² Sullivan, R. 1992. Trouble in paradigms. *Museum New*, February/March, p.41-44.

³³ Koster, E. and Schubel, J. 2007. Raising the relevancy bar in aquariums and science centers. In: Falk, J., Dierking, L, and Foutz, S. *In principle, in practice*. Lanham, MD: AltaMira Press, 197-220.

³⁴ Weil, S. 2006. Beyond management: making museums matter. Study Series 12, International Committee on Management, International Council of Museums, 4-8.

³⁵ Janes, R. 2009. *Museums in a troubled world: renewal, irrelevance or collapse?* New York: Routledge.

³⁶ Koster, E. 2010. The evolution of purpose in science museums and science centres. In: Cameron, F. and Kelly, L. *Hot topics, public cultures and museums*, Newcastle-upon-Tyne: Cambridge Scholars Publishing, 76-94.

*we've failed at affecting change in society and still needed to give those messages, or we just got left behind and we were no longer on the frontier of what mattered in society.*³⁷

*The changes that societies must make will require greater sharing of available information, information which museums, and particularly natural science, hold in their collections. This calls for going beyond disciplinary approaches, which, for museums, means questioning the typologies of collections. It also requires combining scientific approaches with societal questions, both to answer those questions, and to identify issues to which societies should be alerted. The role of sounding the alarm is central, bring museums of natural and human sciences together once again.*³⁸

*In the Anthropocene, nature-focused museums should not only aspire toward our sector's most valuable contributions to date in direct response to the intertwined needs of societies and environments, but also become an exemplar of what relevance means to the entire museum profession.*³⁹

*An international coalition of museums could play a critical role in coordinating more effective public communication on and engagement with climate change.*⁴⁰

*Fundamental knowledge of natural history is lacking in many western societies, as demonstrated by its absence in school science curricula. And yet, to meet local and global challenges such as environmental degradation, biodiversity loss and climate change, we need to better understand the living and non-living parts of the natural world. Many have argued passionately for an increased understanding of natural history; others have developed successful pedagogical programmes for applying knowledge of natural history in environmental initiatives. In joining wider calls, we choose here to focus on the educational value afforded by understanding the epistemological bases of natural history and its particular forms of reasoning. We also briefly discuss the ways in which an education in natural history provides the foundation for environmental and social justice efforts that directly affect the lives of young people and their communities. We end by highlighting the ease by which natural history may be incorporated in learning opportunities both in and outside of the classroom.*⁴¹

*Civilization is revving itself into a pathologically short attention span. The trend might be coming from the acceleration of technology, the short-horizon perspective of market-driven economics, the next-election perspective of democracies, or the distractions of personal multi-tasking. All are on the increase. Some sort of balancing corrective to the short-sightedness is needed-some mechanism or myth which encourages the long view and the taking of long-term responsibility, where 'long-term' is measured at least in centuries.*⁴²

³⁷ American Association of Museums, 2011. The future is in the stars: an interview with Neil deGrasse Tyson. Museum, March-April, 47-51.

³⁸ Van-Praët, M. 2015. Sounding the alarm: challenges to museums of natural and human sciences in the face of the global environmental crisis. ICOM News, 68/3-4, 8-9.

³⁹ Koster, E., Dorfman, E. and Nyambe, T. 2018. A holistic ethos for nature-focused museums in the Anthropocene. In: The Future of Natural History Museums, Dorfman, E. (Ed.), Routledge and International Council of Museums, 29-48.

⁴⁰ Rees, M. 2017. Museums as catalysts for change. Nature Climate Change 7, 166-167.

⁴¹ The Case for Natural History, <https://link.springer.com/article/10.1007/s11191-017-9880-8>.

⁴² <http://longnow.org/about/>.

WORKING GROUP

Logic Flow

1. Core tenets of the geological and biological disciplines are that the past, present and future are interconnected dynamics across the vast continuity of time;
2. The dynamics among and between the concentric shells of the Earth's atmosphere, hydrosphere, biosphere, pedosphere, cryosphere, and lithosphere function as one interdependent system;
3. Since the mid-20th century, during 'The Great Acceleration', the Earth's natural processes have been increasingly impacted by the 'humanosphere' and 'technosphere';
4. Humanity has, in many ways, become philosophically and practically detached from the natural world with its geological and evolutionary history;
5. The term Anthropocene, introduced in 2000, has drawn attention to human impacts on the Earth System and is now approaching a formal status in the Geological Time Scale;
6. The strong consensus of the scientific community is that geologically-rapid changes in climate and weather patterns and in the global rise of sea-level have anthropogenic causes;
7. With its core meaning in the natural sciences, the Anthropocene has become integrated with the historical, anthropological, ecological and environmental disciplines and also entered popular discourse in the news;
8. The Anthropocene summarizes a complex and urgent array of matters central to the philosophy and practice of conservation and sustainability measures;
9. The Anthropocene is a new and encompassing platform for the evolving philosophy and practice of museums and collections of natural history; and
10. The societal and environmental relevance of nature and science focused museums entails their embrace of contemporary matters.

Progress Toolkit

As a result of trends influencing natural history museums, coupled with the recent blurring of their boundary characteristics with other types of museums as well as the clarion call of the Anthropocene, today's nature-focused museums have an unprecedented toolkit to be both more efficient ('doing things right') and effective ('doing the right things') in terms of meaningful community engagement – onsite, online, offsite, and outdoors.

Combining tradition and innovation, here is a partial checklist:

- Issue-driven town hall meetings
- Citizen science project opportunities

Exhibitions, 'permanent' and temporarily featured
Film programs with and without discussion
Learning and teaching programs
Backstage tours to collections
Deaccessioned collections for public access
Living collections
Dialogue with researchers
Lifelong-learning programs
Volunteer and docent opportunities
Thematic showcases
Earth Day programs
ICOM's *International Museum Day* programs
UNESCO's *World Science Day for Peace and Development* programs
Guided connect-with-nature adventures
Links with the arts and humanities
Teacher, parent and youth forums
'Greener future' participation opportunities

Proposed Next Steps

1. By March 31, 2018: That this draft document be honed through invited editorial input from participants at the October 25, 2017 meeting at the Carnegie Museum of Natural History.
2. By April 30, 2018: That the resulting version be reviewed and further improved by the NATHIST Board.
3. By May 31, 2018: That the resulting version becomes the launch document for the **Working Group on the Anthropocene** that, through a collaborative communication plan to be developed, intensifies discourse around why and how nature-focused museums should augment their role to become resources that illuminate the meanings and implications of the Anthropocene to their school and public audiences as well as to their stakeholders.

Respectfully submitted,



Emlyn Koster, PhD
emlyn.koster@naturalsciences.org

APPENDIX A

Material and Participants at the First Meeting

Participants at the October 25th Initial Meeting of the NATHIST Working Group on the Anthropocene

| Name | Title | Organization | Email |
|-----------------------------|--|---|--|
| Aergaaro, Peter | | Natural History Museum, Denmark | kjaergaaro@snm.ku.dk |
| Bernardi, Massimo | | Museo delle Scienze, Trento, Italy | massimo_bernardi@muse.it |
| Boev, Pavel | Chief Program Officer, Footprint and Sustainable Lifestyles | WWF | pboev@wwf.ru |
| Brown, Brian | | Natural History Museum of Los Angeles | bbrown@nhm.org |
| Burch, Alexandra | | Natural History Museum, London | a.burch@nhm.ac.uk |
| Coddington, Dr. Jonathan A. | Director, Global Genome Initiative | Smithsonian Institution | coddington@si.edu |
| Davidson, Sarah Cain | Data Curator | Movebank | sdavidson@orn.mpg.de |
| Dorfman, Dr. Eric J. | Director | Carnegie Museum of Natural History | dorfmane@carnegiemnh.org |
| Fang, Phaedra | | National Taiwan Museum | hsfang@ntm.gov.tw |
| Fraser, Dr. Nick | Keeper, Natural Sciences | National Museums Scotland | nick.fraser@nms.ac.uk |
| Heller, Nicole | Director | Carnegie Museum of Natural History | heller@carnegiemnh.org |
| Hung, Shih-Yu | | National Taiwan Museum | syhung@ntm.gov.tw |
| Kamei, Dr. Osamu | Deputy Director | Center of the History of Japanese Industrial Technology | kameio@kahaku.go.jp |
| KjAergaard, Dr. Peter C. | Museum Director | Natural History Museum, Denmark | kjaergaard@snm.ku.dk |
| Koeberl, Dr. Christian | Director General | Natural History Museum, Vienna | christian.koeberl@univie.ac.at |
| Koerber, Susannah K. | Chief Curator and Research Officer | Indiana State Museum and Historic Sites | skoerber@indianamuseum.org |
| Koster, Emlyn | Director | NC Museum of Natural Sciences | emlyn.koster@naturalsciences.org |
| Kramar, Dr. Nicolas | Director | Musees Cantonaux du Valais | nicolas.kramar@admin.vs.ch |
| Kuo, Chao-ling | Exhibition Coordinator | National Taiwan Museum | clkuo@ntm.gov.tw |
| Laffitte, Lucy | | International Big History Association | lucy.laffitte@gmail.com |
| Lorenzini, Marina | Media Consultant | American Middle East Institute | mlorenzini@americanmei.org |
| Raisz, Kate | | Oakland Museum of California | kateraisz@gmail.com |
| Selter, Sarah | Associate Curator of Natural Science | Carnegie Museum of Natural History | sselter@museumca.org |
| Shreckeryust, Becca | | National Museum of Natural History, Washington, DC | shreckengastb@carnegiemnh.org |
| Starrs, Siobhan | | Deutsches Museum | starrss@si.edu |
| Trischler, Helmuth | | | h.trischler@deutsches-museum.de |
| Tunnickliffe, Sue Dale | Reader in Science Education, Department of Curriculum, Pedagogy & Assessment | University College London | s.tunnickliffe@ucl.ac.uk |
| YABE, Atsushi | | National Museum of Nature and Science, Tokyo | yabetsu@kahaku.go.jp |

**INTERNATIONAL COUNCIL OF MUSEUMS
COMMITTEE ON MUSEUMS AND COLLECTIONS OF NATURAL HISTORY
PROPOSED ICOM-NATHIST ANTHROPOCENE WORKING GROUP**

Whereas ...

- Core tenets of the geological and paleontological disciplines are that the past, present and future are interconnected dynamics across the continuity of time;
- The natural world is being extensively and in many ways irreversibly impacted by humanity which has become largely detached from it;
- The term Anthropocene was introduced in 2000 to draw attention to human impacts on the Earth's natural systems and in 2017 is approaching a formal status in the Geological Time Scale;
- The Anthropocene, while rooted in the natural sciences, has also become integrated with the historical, anthropological, ecological and environmental disciplines and has entered public discourse as a frequent term in the news;
- The Anthropocene summarizes a complex and urgent array of matters central to the philosophy and practice of conservation and sustainability measures;
- The Anthropocene is a new and encompassing platform for the evolving philosophy and practice of museums and collections of natural history;
- The societal and environmental relevance of nature-focused museums is enhanced by their embrace of major contemporary matters; and
- The 2017 ICOM-NATHIST Conference with the theme of *The Anthropocene: Natural History Museums in the Age of Humanity* has included an exploratory meeting of an Anthropocene Working Group.

Be it resolved that ...

- ICOM-NATHIST formalize an Anthropocene Working Group with terms of reference to be approved by the NATHIST Board and with the provisional intent to increase professional discourse around if, why and how nature-focused museums should strive to become resources that illuminate the meanings and implications of the Anthropocene.

Emlyn Koster, PhD
Chair, Anthropocene Working Group
emlyn.koster@naturalsciences.org

Pittsburgh, PA, USA
DRAFT: October 25-26, 2017

ANTHROPOCENE

Partial Bibliography, 2007-2017

Emlyn Koster, PhD

Director, North Museum of Natural Sciences

emlyn.koster@naturalsciences.org

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APPENDIX B

Declarations by the Natural History Museum Sector

The Buffon Declaration

Natural History Institutions and the Environmental Crisis

Concluding Message
from the Buffon Symposium - October 18th and 19th, 2007
Muséum National d'Histoire Naturelle, Paris

Representatives of 93 natural history institutions (natural history museums and research institutes, botanic gardens, zoos...) from 36 countries from all continents met in Paris on 18th and 19th October, 2007, on the occasion of the tercentenary of the birth of Buffon, one of the great founding fathers of the scientific study of the diversity of life.

Given that science is critical for sustainable management of biodiversity and ecosystems and, through it, survival of human populations on this planet, the vital contributions of these institutions are fourfold.

- a) They are the primary repositories of the scientific samples on which understanding of the variety of life is ultimately based.
- b) Through leading-edge research they extend knowledge of the structure and dynamics of biodiversity in the present and in the past.
- c) Through partnerships, and through programs of training and capacity-building, they strengthen the global capability to address current and future environmental challenges.
- d) They are a forum for direct engagement with civil society, which is indispensable for helping bring about the changes of behaviour on which our common future and the future of nature depend.

Today natural history institutions have particular responsibilities because global biodiversity is collapsing. Current approaches are inadequate in the face of this challenge. We therefore reaffirm our commitment to work together, and to develop new integrated approaches to understand and address the environmental crisis, and to communicate the issues to the public, policy makers and a broad range of stakeholders.

We make three recommendations:

1 - Collections of specimens and other databases on nature are a model of nature's variability and are a part of the world's scientific infrastructure (as exemplified by the OECD Global Science Forum). They are crucial tools for understanding the impact of climate change, of biodiversity loss, and other environmental challenges, but natural history collections are nowadays disappearing in many countries due to lack of funding.

We therefore call on governments and organisations to give the conservation of these vital collections increased levels of support.

2 - Naturalist research in the field is essential for the continued gathering and dissemination of information, as well as training and capacity-building initiatives. As a group, natural history institutions have developed, and will continue to develop and implement, best practice in this area. However, current policy changes derived from the U.N. Convention on Biological Diversity have made research, and the management of collections for scientific research on biodiversity, increasingly difficult and expensive.

We therefore call on governments and the Convention on Biological Diversity:

- to recognize the difference between profit-oriented bioprospecting and science-oriented research for the public good, and

- to facilitate non-commercial biodiversity collecting and the movement of specimens

in their approaches to Access and Benefit-Sharing (ABS), including through their development of policy and regulations.

3 – Evolution is without doubt the most acceptable explanation for the diversity of life. It is crucial that only such empirical and testable approaches are accepted as “scientific” when discussing evolution. We strongly urge that support be given for the dissemination of scientific perspectives, which is our duty as outreach organisations, and for the teaching of evolution in schools.

In conclusion, the participants in the Buffon Symposium express the desire that scientists, policy makers and civil society unite in their efforts to achieve sustainable management of nature and the maintenance and restoration of ecosystems and their services upon which civilization depends. We reaffirm our conviction that a flourishing development model that is compatible with a sustainable natural world is possible. We are enthusiastic regarding the contributions we can make through our missions in this context, which consist of extending human knowledge of nature, training specialists of all kinds, and sharing knowledge with the public, particularly young people. We strongly affirm our capacity to provide an unbiased forum for the development of new ideas and new approaches among all the stakeholders concerned.

NATURAL HISTORY: PAST, PRESENT, FUTURE

Emlyn Koster, Bill Watson and Steve Yalowitz

Introduction

As centers for both collections-based science research and informal learning, natural history museums are uniquely equipped among informal science education providers to promote public understanding, engagement and participation with the pressing scientific issues of our time, such as climate change, biodiversity loss, and how to nurture global/cultural understanding. Natural history museums have vast collections that provide historical perspectives essential to addressing these challenges and active scientists whose expertise and passion for the natural world could inspire the same enthusiasm among a public eager to participate in authentic experiences.

However, the natural history museum community has rarely convened members from its many areas of expertise—including scientists, collections managers, exhibition developers, educators, administrators, learning researchers, and evaluators—to work together on how to maximize the potential of our individual and collective assets. In addition to many excellent examples of innovation and collaboration that link audiences with researchers and collections, there is a growing consensus that more needs to be learned about how particular affordances of the people, objects, and technologies of natural history science can best be translated into dynamic and effective experiences.

Conference Goals and Approach

To tackle this need, the Smithsonian's National Museum of Natural History convened a collaborative network of partners for a four-day conference in February 2012—titled "21st Century Learning in Natural History Settings"—to initiate a dialogue about shared vision, shared work and shared learning research among natural history museums and their partners. Enabled by a conference grant from the National Science Foundation (DRL#1100810), 100 attendees gathered, representing 43 national and interna-

tional organizations. Two-thirds were natural history museums and one-third were other organizations such as zoos, nature centers, science centers, universities, and consultancies. Participants applied in teams of two with the stipulation that one would represent a scientific or collections perspective and the other would represent an education, outreach or media perspective. By focusing on diverse points of view, the overall aim was to build stronger networks within participating museums and across institutions and organizations that could support shared innovation, shared learning, and increased public value.



Conference attendees in the Museum of Natural History rotunda

In conceiving this conference, the Smithsonian's National Museum of Natural History and its partners considered that a collaborative and sustained research agenda in informal natural history learning could inform the revitalization of the education efforts of over 800 natural history museums in the United States that serve more than 50 million visitors each year. It could also inform the practice of thousands of other institutions focused on natural history learning (e.g., science centers, nature centers, zoos, aquaria, botanical gardens) and other elements of the informal science education landscape (e.g., the Internet, TV, newspapers).

Conference attendees worked diligently at the intersection of imagining a new future, initiating innovative experiences that leverage new scientific and communication technologies, and leveraging existing best and promising practices more broadly. They also began to articulate a shared learning research agenda as the connective tissue among these elements and the blueprint for the future of fully engaging onsite and online audiences. The learning research agenda is expected to provide

direction for further joint work by helping to establish a strong foundation of effective practices that link our rich assets with expanding and diverse publics in new and meaningful ways.

For more information about the conference and current work continuing the dialogue, please see the conference wiki at <http://21centurylearningnmnh.wikispaces.com/>.

The Present is the Key to the Past as well as to the Future

The "21st Century Learning in Natural History Settings" conference brought into a contemporary light a core principle of historical geology, one dating back to a breakthrough realization in 1785 by Scotland's James Hutton, that the present is the key to the past. Stressing the continuity of time and natural processes, the conference equally concerned itself with the geological future. It noted that the Earth science profession is currently considering a potential renaming of the current epoch as the Anthropocene (Koster, 2011) and that the theme of the Geological Society of America's 2011 conference was "From the Archean to the Anthropocene: The Present is the Key to the Future." If formally approved, the Anthropocene will conspicuously recognize the cumulative, and in most aspects irreversible, impacts of humanity on the evolved balances of systems in the atmosphere, hydrosphere, biosphere, and surface lithosphere.

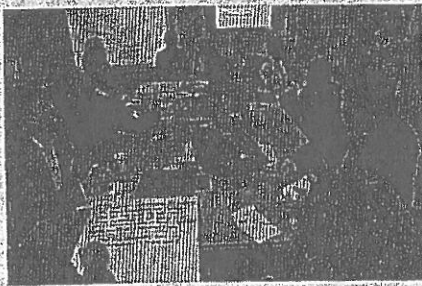
As the "Planet Under Pressure: New Knowledge Towards Solutions" conference in London last March stated in its State of the Planet Declaration (http://www.planetunderpressure2012.net/pdf/state_of_planet_declaration.pdf): "insights from recent research demand a new perception of responsibilities and accountabilities of nation states to support planetary stewardship."

The group that was focused on public value during the "21st Century Learning in Natural History Settings" conference—in a strikingly parallel step to the "Planet Under Pressure" conference—drafted a declaration with this text as its preamble: "Humanity is embedded within nature and we are at a critical moment in the



continuity of time. Our collections are the direct scientific evidence for evolution and the ecological interdependence of all living things. The human species is actively altering the Earth's natural processes and reducing its biodiversity. As the sentient cause of these impacts, we have the urgent responsibility to give voice to the Earth's immense story and to secure a sustainable future."

After being conceived during an early breakout session, this statement was used as a provisional umbrella framework for other breakout and plenary sessions. Following the conference, it remains a draft under review and subject to refinement.



Breakout session

The leadership of the "21st Century Learning" conference stated at its outset that natural history museums have reached a stage where they need to marry their assets with their publics in new and innovative ways. As the conference's draft declaration emphasizes, a natural history museum's collections and their researchers are its prime authorizing assets. Today though, the asset of collections needs to be jointly marshaled for maximum public benefit by also leveraging the full suite of more recently developed, brand-shaping assets. These include the museum's pre-school, school and after-school educational programs, family and adult programs, citizen science projects, facilities and technology, and its local and global connections.

The "21st Century Learning" conference was a refreshing professional experience because of its enthusiastic alignment with the museum field's increasing interest to gear up from being nice to also being necessary. Surely each part of the museum field would be well served by reflecting on the evolution of its purpose for

the greater good for society and the environment: for science museums and science centers, see Friedman (2010), Kadlec (2009) and Koster (2010). Without a grasp of the rationale, direction and scale of past contributions, a museum's ability to envision its optimal future is hindered. Those gathered at the "21st Century Learning" conference were treated to the compelling example of the Denver Museum of Nature and Science as an institution with an unusually detailed, and therefore spirited, sense of its past, present and future.

The National Science Foundation and the Smithsonian's National Museum of Natural History are to be commended for their vision to convene a group dedicated to a candid reflection on the greater public value potential of natural history settings, and particularly of major museums specializing in this subject area with an orientation to future sustainability matters. In the future, it would be additionally powerful for major natural history museums to collaborate with co-invested entities, nationally and internationally. These could include the protected areas pursuant to the UNESCO 1972 Convention Concerning the Protection of World Cultural and Natural Heritage, other protected wilderness and marine sanctuary areas, ecotourism experience coordinators, and conservation groups such as the Audubon Naturalist Society which, for example, participated in the "21st Century Learning" conference.

A Collective Audience Research Agenda

A critical link between the nascent shared vision that emerged from the conference, and our path for moving forward to realize it, is learning research that provides a foundation for breaking new ground for and with our publics. Increasingly, informal science education institutions—museums, science centers, zoos and aquaria—have turned their attention to engaging with the public in a way that goes beyond the collections of objects and specimens that are exhibited. As such, the audience research and evaluation fields have followed suit, focusing on broader experiences and outcomes. While the evaluation of single exhibits and programs continues to be an integral contribution to designing and devel-

oping effective visitor experiences, there is increasing attention being given to conducting more basic, general research with visitors (e.g., how to engage them, how they learn, use of social media). This shift has been supported by funding agencies: the National Science Foundation has added a research category to its informal science education grants and the National Oceanic and Atmospheric Administration funds projects that include understanding how to most effectively engage audiences in areas such as climate change.

The "21st Century Learning" conference and network responds to this trend with a specific focus on learning through and with natural history museums and their assets, partners, and publics. One of the specific goals of the conference was to initiate a learning research agenda to provide an empirical foundation for the practice that will enable the realization of a revitalized vision for public value. This recognizes the increasing importance of field-wide and collaborative research as a means for more fully connecting the work that these institutions and their scientists are doing with their publics in support of the vision for shared public value in the 21st Century. This is also an approach that will help to maximize the societal return on funding investments at any scale.

The latest draft of the Learning Research Agenda from the conference is on the public wiki at <http://21centurylearningnmnh.wikispaces.com/Learning+Research+Agenda>. A subgroup of conference attendees synthesized the themes and trends that emerged from the conference within a learning research framework. The research topics that emerged are:

1. How people learn about critical concepts: ecology, evolution, climate change, extinction, biodiversity
2. Reaching new audiences, broadening our impact
3. Facilitation and mediation
4. Exploring the connection between emotion and learning
5. Collections and learning from objects
6. Connecting learning and organizational change in museums

"History," continued on following page

"History," continued from previous page

On the wiki, a preliminary set of example research questions are identified for each of these research topics. These questions—and those that are emerging for the final agenda—are a starting point for the field to begin researching these topics, collectively pooling our resources and collaborating in ways that will help us start to answer these questions. By no means are these the only questions, and the wiki is a way to include a broader section of the community in continuing the conversation started at the conference. These draft questions begin to scope out a set of topics which natural history museums and their partners are uniquely suited to address.

We encourage readers to join the conference wiki and contribute to its important discussion about the future of natural history museums and the kinds of learning research we should be conducting to maximize public value in the potentially imminent new epoch of the Anthropocene.

Emlyn Koster, PhD, is President and CEO and Steve Yalowitz, PhD, is Vice President, Research Associates and Interns, respectively, of the Institute for Learning Innovation. Bill Watson, EdD, is Chief of Learning Experiences and Evaluation at the Smithsonian's National Museum of Natural History. They can be reached at koster@ilinet.org, yalowitz@ilinet.org and watsonb@si.edu.

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"Themed," continued from page 11

and other countries brought a need for new techniques to control traffic flow through the exhibit. Instead of just wandering in a large room, visitors traveled a linear path. Theatrical and theme park techniques were united with museum exhibition design. Lighting, sound, graphics, and artifact placement all helped guide large crowds through the space in an organized fashion.

- Disney's Epcot. For the first time, educational exhibits were integrated into a major theme park on a massive scale. From Van Roman's artifact displays in World Showcase to the science center exhibits in Future World, exhibit designers and Imagineers worked together in successfully merging education and entertainment in a themed environment.

Then came the year 1991 and the formation of the Themed Entertainment Association (TEA). Brian Edwards, a past president whose company, Edwards Technologies, has been a member of the TEA from the start, remembers, "TEA provided a way for all us individual contractors to get our message across to the big operators. Then we started looking at other markets that could benefit from what TEA members had to offer, and a lot of us started to concentrate on museums."

Edwards was one of them, contributing his company's services to a number of projects, several of which earned Thea Awards. One of them was a Thea recipient last year, and it's an excellent example of how themed entertainment design can transform a museum—the National Infantry Museum and Soldier Center in Columbus, Georgia, USA.

The original museum, with artifacts on display from 1775 to the present, had been housed in the cramped quarters of an old Army hospital built in 1923. In 2009, a new \$100 million building pre-

miered. Dedicated to the Infantry soldiers, the museum was designed using the best themed entertainment principles. Architecture, landscaping, lighting, sound, graphics, video production, props, artifacts, audiovisual engineering, and many other disciplines worked together to not only exhibit the artifacts that tell the story of the Infantry, but to tell that story in an emotional context that pulls the visitor forward on an personal exploratory journey.

At the opening ceremonies, Colin Powell remarked, "This site is much more than a mere memorial. The word 'museum' is inadequate to describe it."

Sometimes museums don't have \$100 million to spend. And sometimes the ideal they're trying to convey is a bit abstract and difficult to put in a tangible form. Science North, recipient of a Thea Award this year for Outstanding Achievement on a Limited Budget, took all the same themed entertainment ingredients that were used on the National Infantry Museum and put them to good use in The Changing Climate Show on a budget of just \$600,000. Hosted by Sheepie, a computer animated sheep voiced by the Canadian Broadcasting Corporation's Rick Mercer, the exhibit explores climate change on a global scale with the help of the "Fleece-net," which connects Sheepie to others of his kind around the world. The show utilizes a combination of HD video, physical sets, and lighting and sound effects. Visitors of all ages go away with a better understanding of climate change and what they can do to make a difference.



Sheepie

ICOM NATHIST

Taipei Declaration on Conservation



A major role of natural history museums is to collect and steward natural history objects, generating knowledge regarding these objects and disseminating this knowledge to the community.

Natural history museums also engage the public to form deep bonds with the natural world and commit to its preservation.

Increased human activities have created catastrophic declines in biodiversity. Both ethics and logic point to a mandate to conserve vulnerable habitats and species. To achieve best practice, natural history museums take action to conserve natural habitats and populations.

- ICOM NATHIST, Taipei 2015

APPENDIX C

Declarations by the Science Center Sector

THE TORONTO DECLARATION

Leaders from science centres and museums around the world met in Toronto, Ontario, Canada from June 14-19, 2008 for the Fifth Science Centre World Congress. 400 delegates from 51 countries participated, continuing the dialogue from previous gatherings in Finland (1996), India (1999), Australia (2002) and Brazil (2005).

Each year, 290,000,000 citizens actively participate in the exhibitions, programs, events and outreach initiatives organized by 2,400 science centres worldwide. Science centres stimulate curiosity and develop enquiring minds. They change people's lives, influencing their attitudes and thinking. Research shows that science centres demystify science, conveying its beauty, showing its necessity and making it accessible to the general public. They foster positive attitudes towards science, help people to appreciate the context of scientific advances and to understand how science affects their lives.

In 2008, science literacy is as important as other forms of literacy and numeracy. It is also a powerful tool for social inclusion. Science centres have relevance to all sectors of the population and have become important meeting places for science and society. They operate across geographical, economic, political, religious and cultural boundaries. They impact the well-being, education, achievement and skills of current and future generations. They are safe places for difficult conversations.

Around the world today, science centres:

- are highly-visible and trusted hubs of activity, dialogue and discourse about science and technology
- support the skills needed for effective problem-solving, creativity, innovation, critical thinking and decision-making, therefore enhancing lifelong learning of science and technology
- are important resources for the formal education system and contribute to strengthening the knowledge bases of their respective societies
- influence the motivation of students, the learning process and their career choices
- empower teachers, introducing them to more effective ways of teaching science, mathematics and technology
- create important platforms for the increasing number of virtual visitors engaging with science – and with each other – using on-line and digital technologies
- influence research and museology related to science communication, education and engagement
- present global knowledge of science and technology within the local reality
- are trusted places of inclusion and equity where the public can actively engage with critical issues which affect society
- form strategic partnerships to help address important local, national and global challenges



6th SCIENCE CENTRE WORLD CONGRESS

4 - 8 SEPTEMBER 2011
CAPE TOWN, SOUTH AFRICA

Science Across Cultures

CAPE TOWN DECLARATION

At the 6th Science Centre World Congress convened in Cape Town, South Africa, from 4-8 September 2011, 416 delegates from 56 countries assessed the impact of science centres worldwide and formulated plans that will ensure that they continue to play a constructive role in addressing global issues at the interface between science and society. The Congress continued the dialogue from previous world gatherings in Finland (1996), India (1999), Australia (2002), Brazil (2005) and Canada (2008).

Globally, science centres and interactive museums have taken the lead in hands-on, inquiry-based learning, and have achieved a high trust rate for the accuracy of the information that they communicate. They focus on promoting dialogue and debate while learning, and on deriving explanations, rather than just providing answers, for important scientific discoveries and phenomena. They endeavour to promote social engagement across generations and cultures as well as an ethos of lifelong learning.

Each year, over 310 million people actively participate in the in-house and outreach science engagement programmes organized by over 2 500 science centres in more than 90 countries and administrative regions. These science centres recognize that the three pillars of interactive science engagement are science knowledge, hands-on interaction, and dialogue and the co-creation of experiences with scientists and the public.

Science centres also recognize that 'smart play' is one of the most effective ways of learning for people of all ages. Their role is to reach beyond the provision of information into the development of understanding and wisdom. This wisdom brings about changed mindsets and behaviours that lead to the development of more sustainable life styles. Science centres help people, and therefore societies, to maximize their potential.

Science centres are places where construction of meaning takes place, and scientific and technological advances are understood in their appropriate contexts. Although trust in scientists remains high, science centre audiences do not automatically accept that all scientific advances mean progress for everyone. They want to engage with scientists and to understand the long term implications of their research. There is thus a need for improved dialogue between scientists and the public during the course of the scientific process that leads to societal change.

This Declaration is consistent with the core contributions made by science centres worldwide and outlined in the Toronto Declaration of 2008. This Cape Town Declaration of 2011 notes that, over the past three years, science centres have especially:

- Linked their programmes to the Millennium Development Goals of the United Nations, especially by promoting universal education, creating awareness of HIV/Aids, and promoting environmental sustainability.

Plans to achieve these resolutions will be developed, as appropriate, at institutional, national and international levels. At the 2014 Science Centre World Summit, to be held at Technopolis® in Mechelen, Belgium, in 2014, science centres and museums shall assess the extent to which they have, as individual institutions and collectively, achieved the goals set out here.

6TH SCIENCE CENTRE
WORLD CONGRESS
CAPE TOWN
SOUTH AFRICA
www.6scwc.org
8 September, 2011

CAPE TOWN DECLARATION ENDORSED BY:

ASPAC - Asia Pacific Network of Science and Technology Centres

ASTC - Association of Science-Technology Centers

Ecsite - European Network of Science Centres and Museums

NAMES - The North Africa and Middle East Science centers network

NCSM - National Council of Science Museums, India

Red-POP - Network for the Popularization of Science and Technology in Latin America and the Caribbean

SAASTECC - Southern African Association of Science and Technology Centres

- Strived to form collaborative partnerships across cultural, political, economic and geographical boundaries so as to ensure that the most effective methods of science and technology engagement reach more societies and communities.
- Considered the value of 'real' experiences and the inherent benefits of engaging directly with visitors, while making increasingly effective use of web-based digital media, as well as mixed-reality and virtual reality media, to engage with their publics.
- Celebrated the universality of science whilst recognizing its multi-cultural origins and the value of indigenous knowledge systems.
- Strongly promoted creativity, invention and innovation.
- Facilitated greater engagement between scientists and the general public so that public opinions on science and technology issues can be heard and debated.

At the 6th Science Centre World Congress, leaders of science centres and museums worldwide resolve to:

- Encourage the establishment of science centres and museums in parts of the world where they are lacking.
- Support a policy of investment in science, technology and innovation in response to global economic and financial challenges.
- Partner with formal education, arts, business, policy makers and media where relevant.
- Strive to address cross-generational science- and technology-related problems that are relevant to local, regional and global communities, and to develop programmes that allow the general public to contribute actively to the resolution of these problems.
- Continue to develop programmes that promote awareness of the multi-cultural roots of science and the value of indigenous knowledge systems.
- Continue to develop partnerships to promote science awareness and engagement across cultural, political, economic and geographical boundaries.
- Conduct further research that measures the efficiency and effectiveness of their programmes, and to act on this information in order to improve their efficiency and impact.
- Further promote dialogue between scientists and the general public so that public opinions on science and technology can be heard and incorporated into decision-making processes.
- Further promote creativity, invention and innovation that leads to more sustainable life styles.
- Work together to ensure that they share their joint experience and knowledge of the most effective methods of engaging with science and technology with other local, regional, national and international bodies that promote science and technology awareness.



Mechelen Declaration

19 March 2014

Introduction

The leaders of science centres and museums from 58 countries around the world came together at the Science Centre World Summit, in Mechelen, Belgium from March 17-19, 2014. This high-level international gathering of 443 attendees built upon the contributions of the previous six World Congress meetings held since 1996 on different continents. During this Summit, science centre leaders met with global policy makers, scientists and leading business representatives to exchange ideas about science, public engagement with science and the role that science communication and science centres should play in our rapidly changing society. With a continuing commitment to impact, the science centre field puts forward this Declaration as a worldwide action plan.

Since 1996, there has been a marked increase in the number of science-based public policy issues in areas such as climate and energy, pandemic disease, digital privacy and research. Public engagement with science has increased, and the digital revolution that has radically changed our relationship with technology has created new modes of communication and learning. Science centres have shown a remarkable range of diverse responses, adapting to local contexts, responding to community needs and reflecting policies of inclusiveness. Governments, scientific enterprises, international institutions, multinational corporations and the education field all recognise that citizen engagement in current global scientific and technological issues is crucial to the advancement, prosperity and welfare of everyone. Nearly 3 000 science centres worldwide are spearheading hands-on, enquiry-based learning, and have achieved a high trust rating among their more than 310 million annual participants.

Increasingly, science centres are moving beyond the traditional hands-on exploration of scientific phenomena. Many centres are engaging with their audiences in the dialogues that address global challenges, and equipping them to become active players within their communities – thereby helping to achieve the current Millennium Development Goals of the United Nations, and the Sustainable Development Goals to be launched in 2015.

Science Centre World Impact

Considerable progress in our field has been made since the World Congress in 2011. Numerous new science centres have been established - especially in Africa, Latin America, around the Mediterranean, in Eastern Europe and in Asia - with increased attention to local context, indigenous knowledge and diverse

audiences. There are many more examples of increased dialogue between scientists and the general public, through which public opinions on science and technology can be heard and incorporated into decision-making. People are now better able to comment on science investment and policy development processes, and are encouraged and educated to make active commitments to solving global and regional problems. A significant increase in the extent to which science centres have promoted creativity, invention and innovation has led to more sustainable lifestyles.

The Science Centre World Summit 2014

There has been an unprecedented development of partnerships, promoting science awareness and engagement across cultural, political, economic and geographical boundaries. Stronger collaborations have now been created with formal education, the arts, business, policy makers and media worldwide. The Science Centre World Summit 2014 provided the opportunity to continue this process, to retool existing partnerships and to build new collaborative efforts with shared visions for the future. It was a valuable occasion for addressing the challenges presented by continually changing multifaceted circumstances for both science centres and partners.

The 2014 Summit worked to convince more policy makers, scientists, global companies and multi-national institutions of the importance of collaborations with science centres throughout the world. Such collaborations will be steps towards the common goal of bridging the gap between citizens and science and technology, and thus to resolving many global problems. Science centres are not simply places where visitors have nice learning experiences or a great time on a rainy afternoon; they are unique institutions that transform the way in which people of all ages think and act. Reinforcing the collaborations will advance issues related to the public engagement with science and technology at a higher strategic level than before. At the same time, these partnerships will create a climate in which all parties support one another's messages and tasks.

Therefore science centres, worldwide, and their partners commit to these goals toward the future:

We will ...

1. Investigate how to engage even more effectively with local communities and increasingly diverse audiences, and keep the focus on gender differences in engagement.
2. Continue taking actions that have a positive global impact and that will make people everywhere more aware of the opportunities that science and technology hold for the sustainable advancement of humankind.
3. Draw the attention of decision makers and the media to the essential role of public engagement with science and technology by setting up high-profile global activities.

4. Endeavour to leverage the position of science centres as “trusted” places to introduce the public to new technological solutions and sustainable technologies, and to broaden the potential use of these solutions.
5. Take the lead in developing the best methods for engaging learners and optimizing their education in both formal and informal settings using appropriate technologies in widely varying contexts.
6. Engage the public more directly with research, using this engagement to help empower people, broaden attitudes and ensure that the work of universities and research institutions is relevant to society and to wider social concerns on a global scale.
7. Work together in a creative celebration of the International Science Centre Year 2019, encouraging people throughout the world to take part in shared experiences relating to science and technology and society.

Tokyo Protocol

On the Role of Science Centres and Science Museums Worldwide In Support of the United Nations Sustainable Development Goals

Preamble

Science centres and science museums throughout the world are committed to promoting scientifically literate societies and participatory citizenship, by educating, empowering and inspiring people of all ages about the impact of science on their lives. Since 1996, leaders of the field have convened in six world congresses, reaffirming these commitments in two formal declarations (Toronto and Cape Town.) These congresses provided the basis for convening the first Science Centre World Summit (SCWS2014) in Mechelen, Belgium, yielding the comprehensive Mechelen Declaration of principles and concrete actions to enhance public engagement for a better world.

At the convening of the second Science Centre World Summit (SCWS2017) on 15-17 November, 2017 in Tokyo, Japan, parties recognise the importance of applying the principles of the Mechelen Declaration more precisely to strengthening public engagement in global sustainability. Underscoring this important role for the field,

The Parties to this Protocol:

Recalling the Sustainable Development Goals (SDGs) endorsed by the United Nations (UN) in 2015 that are global in scope and impact;

Recognising that science, technology, engineering and mathematics (STEM) is critical to meet these challenges and that STEM is universally relevant across borders and cultures;

Emphasising that public engagement and action in science and technology are key to achieving the SDGs;

Endorsing the commitments and achievements to date of global, regional and local organisations worldwide to achieve these goals for the benefit of all life forms on the planet.



Taking into account that everyone must play a part to meet the challenges addressed by the SDGs and that these will be fulfilled by the actions of individuals in communities throughout the world;

Recognising as well that the rapid pace of change in the world today - scientifically, technologically, demographically and economically - offers both challenges and new opportunities for collective actions to achieve the SDGs;

Acknowledging that nearly 3000 science centres and science museums that influence more than 310 million visitors and participants are deeply committed to raising awareness and helping all members of society to be participants in the solutions achievable to meet these goals for our planet;

Expressing confidence that science centres and science museums are agile institutions responsive to rapid changes and behaving proactively, share the vision on their roles in the ever-changing society;

Declaring that science centres and science museums worldwide are concerned, committed, and prepared to address these increasingly urgent goals,

Have agreed as follows:

General Provision

This Protocol stands as a fully endorsed supplement to the Mechelen Declaration opened for signature on 19 March, 2014 at the convening of the first Science Centre World Summit in Mechelen, Belgium and adopted as a framework with the following seven action points:

We will ...

- 1. Investigate how to engage even more effectively with local communities and increasingly diverse audiences, and keep the focus on gender differences in engagement.*
- 2. Continue taking actions that have a positive global impact and that will make people everywhere more aware of the opportunities that science and technology hold for the sustainable advancement of humankind.*

3. *Draw the attention of decision makers and the media to the essential role of public engagement with science and technology by setting up high-profile global activities.*
4. *Endeavour to leverage the position of science centres as “trusted” places to introduce the public to new technological solutions and sustainable technologies, and to broaden the potential use of these solutions.*
5. *Take the lead in developing the best methods for engaging learners and optimizing their education in both formal and informal settings using appropriate technologies in widely varying contexts.*
6. *Engage the public more directly with research, using this engagement to help empower people, broaden attitudes and ensure that the work of universities and research institutions is relevant to society and to wider social concerns on a global scale.*
7. *Work together in a creative celebration of the International Science Centre Year 2019, encouraging people throughout the world to take part in shared experiences relating to science and technology and society.*

Statement of Purposes

The **purposes** of this Protocol are therefore to:

- I. **Recognise and utilize** science centres and science museums as platforms to help various relevant stakeholders build a better understanding of the challenges of realising the SDGs in increasingly diverse communities;
- II. **Bring** to the attention of the decision makers worldwide the accomplishments of the science centre and science museum field with regard to the SDGs consistent with the relevant action points of the Mechelen Declaration.

With Actions Set Forth:

The Parties to this Protocol will endeavour to –

- I. **Give priority consideration to the importance and urgency of expanding public awareness of, and engagement in actions that help achieve the SDGs;**
- II. **Undertake actions relevant and appropriate to local communities with consideration for the SDGs;**
- III. **Serve as platforms for discourse and exchange among all diverse actors in society on these critical issues - bridging ideas, cultures, and views, whether they are founded in indigenous knowledge and long-standing traditions or fashioned in the rapid pace of global change;**
- IV. **Establish new and strengthen existing partnerships and collaborations with other organisations and entities that share the commitment of science centres and science museums to raise public awareness and engagement toward timely success in achieving the SDGs;**
- V. **Embrace and incorporate the contributions of technological innovation as tools to more effectively engage the public in these topics;**
- VI. **Serve as trusted links and valued communicators of both the progress being made and the challenges encountered by the scientific research community worldwide in contributing to the achievement of the SDGs;**
- VII. **Support advancement in the number, capabilities and efforts of science centres and science museums everywhere to achieve progress in meeting the SDGs;**
- VIII. **Accept the responsibility to serve as catalysts for better understanding and coordinated actions within communities throughout the world by stimulating tolerance and critical thinking, distinguishing fact from belief, reinforcing the imperative for evidence-based decision-making, and inspiring a new generation to view the SDGs as foundations on which to grow a better world;**
- IX. **Support the organisation of collective worldwide public STEM activities, wherever possible, to include observance of an annual international science centre and science museum day, consistent with intent of action item #7 of the Mechelen Declaration, but modifying in scope from an international year to an annual international day.**



SCWS 2017
Connecting the World
for a Sustainable Future

Signature and Entry into Force

Upon signature of this Protocol, the Parties acknowledge their commitment to apply their best possible efforts towards the realization of the actions set forth in this Protocol.

As of this date 17th June, 2017



LIM Tit Meng
President
Asia Pacific Network of Science &
Technology Centres (ASPAC)



Luisa Massarani
Director
Latin American and Caribbean Network for
the Popularization of Science and
Technology (RedPOP)



Linda Conlon
Chair
Association of Science – Technology
Centers (ASTC)



Sawsan Dalaq
President
North Africa and Middle East Science
centers network (NAMES)



Michiel Buchel
President
Ecsite - European network of science
centres and museums



Mondli Mnguni
Chair
Southern African Association of Science &
Technology Centres (SAASTEC)

APPENDIX D

UNESCO Recommendations concerning the Protection and Promotion of Museums and Collections, their Diversity and their Role in Society

[UNESCO Recommendation on museums, adopted by General Conference of UNESCO, November 2015]

Recommendation concerning the protection and promotion of museums and collections, their diversity and their role in society

Paris, 17 November 2015

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

The General Conference,

Considering that museums share some of the fundamental missions of the Organization, as stipulated in its Constitution, including its contribution to the wide diffusion of culture, and the education of humanity for justice, liberty and peace, the foundation of the intellectual and moral solidarity of humanity, full and equal opportunities for education for all, in the unrestricted pursuit of objective truth, and in the free exchange of ideas and knowledge,

Also considering that one of the functions of the Organization, as laid out in its Constitution, is to give new impulse to popular education and to the dissemination of culture: by collaborating with Members, at their request, in the development of educational activities; by instituting collaboration among countries to advance the ideal of equality of educational opportunity without regard to race, gender or any distinctions, economic or social; and to maintain, increase and disseminate knowledge,

Recognizing the importance of culture in its diverse forms in time and space, the benefit that peoples and societies draw from this diversity, and the need to strategically incorporate culture, in its diversity, into national and international development policies, in the interest of communities, peoples and countries,

Affirming that the preservation, study and transmission of cultural and natural, tangible and intangible heritage, in its movable and immovable conditions, are of great importance for all societies, for intercultural dialogue among peoples, for social cohesion, and for sustainable development,

Reaffirming that museums can effectively contribute towards accomplishing these tasks, as stated in the 1960 Recommendation concerning the Most Effective Means of Rendering Museums Accessible to Everyone, which was adopted by the General Conference of UNESCO at its 11th session (Paris, 14 December 1960),

Further affirming that museums and collections contribute to the enhancement of human rights, as set out in the Universal Declaration of Human Rights, in particular its Article 27, and in the International Covenant on Economic, Social and Cultural Rights, in particular its Articles 13 and 15,

Considering museums' intrinsic value as custodians of heritage, and that they also play an ever-increasing role in stimulating creativity, providing opportunities for creative and cultural industries, and for enjoyment, thus contributing to the material and spiritual well-being of citizens across the world,

Considering that it is the responsibility of every Member State to protect the cultural and natural heritage, tangible and intangible, movable and immovable, in the territory under its jurisdiction in all circumstances and to support the actions of museums and the role of collections to that end,

Noting that a body of international standard-setting instruments – adopted by UNESCO and elsewhere – including conventions, recommendations and declarations, exists on the subject of the role of museums and collections, all of which remain valid,ⁱⁱ

Taking into account the magnitude of socio-economic and political changes that have affected the role and diversity of museums since the adoption of the 1960 Recommendation concerning the Most Effective Means of Rendering Museums Accessible to Everyone,

Desiring to reinforce the protection provided by the existing standards and principles referring to the role of museums and collections in favour of cultural and natural heritage, in its tangible and intangible forms and to related roles and responsibilities,

Having considered proposals on the Recommendation concerning the Protection and Promotion of Museums and Collections, their Diversity and their Role in Society,

Recalling that a UNESCO recommendation is a non-binding instrument that provides principles and policy guidelines addressing different stakeholders,

Adopts this Recommendation on the 17th of November 2015.

The General Conference [of UNESCO] recommends that Member States apply the following provisions by taking whatever legislative or other measures may be required to implement, within their respective territories under their jurisdiction, the principles and norms set forth in this Recommendation.

Introduction

1. The protection and promotion of cultural and natural diversity are major challenges of the twenty-first century. In this respect, museums and collections constitute primary means by which tangible and intangible testimonies of nature and human cultures are safeguarded.
2. Museums as spaces for cultural transmission, intercultural dialogue, learning, discussion and training, also play an important role in education (formal, informal, and lifelong learning), social cohesion and sustainable development. Museums have great potential to raise public awareness of the value of cultural and natural heritage and of the responsibility of all citizens to contribute to their care and transmission. Museums also support economic development, notably through cultural and creative industries and tourism.
3. This Recommendation draws the attention of Member States to the importance of the protection and promotion of museums and collections, so that they are partners in sustainable development through the preservation and protection of heritage, the protection and promotion of cultural diversity, the transmission of scientific knowledge, the development of educational policy, lifelong learning and social cohesion, and the development of the creative industries and the tourism economy.

I. DEFINITION AND DIVERSITY OF MUSEUMS

4. In this Recommendation, the term *museum* is defined as a “non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its

environment for the purpose of education, study and enjoyment”.ⁱⁱⁱ As such, museums are institutions that seek to represent the natural and cultural diversity of humanity, playing an essential role in the protection, preservation and transmission of heritage.

5. In the present Recommendation, the term *collection* is defined as “an assemblage of natural and cultural properties, tangible and intangible, past and present”.^{iv} Every Member State shall define the scope of what it understands by *collection* in terms of its own legal framework, for the purpose of this Recommendation.
6. In the present Recommendation, the term *heritage* is defined^v as a set of tangible and intangible values, and expressions that people select and identify, independently of ownership, as a reflection and expression of their identities, beliefs, knowledge and traditions, and living environments, deserving of protection and enhancement by contemporary generations and transmission to future generations. The term *heritage* also refers to the definitions of cultural and natural heritage, tangible and intangible, cultural property and cultural objects as included in the UNESCO Culture Conventions.

II. PRIMARY FUNCTIONS OF MUSEUMS

Preservation

7. The preservation of heritage comprises activities related to acquisition, collection management, including risk analysis and the development of preparedness capacities and emergency plans, in addition to security, preventive and remedial conservation, and the restoration of museum objects, ensuring the integrity of the collections when used and stored.
8. A key component of collection management in museums is the creation and maintenance of a professional inventory and regular control of collections. An inventory is an essential tool for protecting museums, preventing and fighting illicit trafficking, and helping them fulfil their role in society. It also facilitates the sound management of collections mobility.

Research

9. Research, including the study of collections, is another primary function of museums. Research can be carried out by museums in collaboration with others. It is only through the knowledge obtained from such research that the full potential of museums can be realized and offered to the public. Research is of utmost importance for museums to provide opportunities to reflect on history in a contemporary context, as well as for the interpretation, representation and presentation of collections.

Communication

10. Communication is another primary function of museums. Member States should encourage museums to actively interpret and disseminate knowledge on collections, monuments and sites within their specific areas of expertise and to organize exhibitions, as appropriate. Furthermore, museums should be encouraged to use all means of communication to play an active part in society by, for example, organizing public events, taking part in relevant cultural activities and other interactions with the public in both physical and digital forms.
11. Communication policies should take into account integration, access and social inclusion, and should be conducted in collaboration with the public, including groups that do not normally visit museums. Museum actions should also be strengthened by the actions of the public and communities in their favour.

Education

12. Education is another primary function of museums. Museums engage in formal and non-formal education and lifelong learning, through the development and transmission of knowledge,

educational and pedagogical programmes, in partnership with other educational institutions, notably schools. Educational programmes in museums primarily contribute to educating various audiences about the subject matters of their collections and about civic life, as well as helping to raise greater awareness of the importance of preserving heritage, and fostering creativity. Museums can also provide knowledge and experiences that contribute to the understanding of related societal topics.

III Issues for museums in society

Globalization

13. Globalization has permitted greater mobility of collections, professionals, visitors and ideas which has impacted museums with both positive and negative effects that are reflected in increased accessibility and homogenization. Member States should promote the safeguarding of the diversity and identity that characterize museums and collections without diminishing the museums' role in the globalized world.

Museum relations with the economy and quality of life

14. Member States should recognise that museums can be economic actors in society and contribute to income-generating activities. Moreover, they participate in the tourism economy and with productive projects contributing to the quality of life of the communities and regions in which they are located. More generally, they can also enhance the social inclusion of vulnerable populations.
15. In order to diversify their sources of revenue and increase self-sustainability, many museums have, by choice or necessity, increased their income-generating activities. Member States should not accord a high priority to revenue generation to the detriment of the primary functions of museums. Member States should recognize that those primary functions, while of utmost importance for society, cannot be expressed in purely financial terms.

Social role

16. Member States are encouraged to support the social role of museums that was highlighted by the 1972 Declaration of Santiago de Chile. Museums are increasingly viewed in all countries as playing a key role in society and as a factor in social integration and cohesion. In this sense, they can help communities to face profound changes in society, including those leading to a rise in inequality and the breakdown of social ties.
17. Museums are vital public spaces that should address all of society and can therefore play an important role in the development of social ties and cohesion, building citizenship, and reflecting on collective identities. Museums should be places that are open to all and committed to physical and cultural access to all, including disadvantaged groups. They can constitute spaces for reflection and debate on historical, social, cultural and scientific issues. Museums should also foster respect for human rights and gender equality. Member States should encourage museums to fulfil all of these roles.
18. In instances where the cultural heritage of indigenous peoples is represented in museum collections, Member States should take appropriate measures to encourage and facilitate dialogue and the building of constructive relationships between those museums and indigenous peoples concerning the management of those collections, and, where appropriate, return or restitution in accordance with applicable laws and policies.

Museums and Information and Communication Technologies (ICTs)

19. The changes brought about by the rise of information and communication technologies (ICTs) offer opportunities for museums in terms of the preservation, study, creation and transmission of heritage and related knowledge. Member States should support museums to share and disseminate knowledge and ensure that museums have the means to have access to these technologies when they are judged necessary to improve their primary functions.

IV Policies

General policies

20. Existing international instruments relating to cultural and natural heritage recognize the importance and social role of museums in their protection and promotion, and in the overall accessibility of this heritage to the public. In this regard, Member States should take appropriate measures so that museums and collections in the territories under their jurisdiction or control benefit from the protective and promotional measures granted by these instruments. Member States should also take appropriate measures to strengthen museum capacities for their protection in all circumstances.
21. Member States should ensure that museums implement principles of applicable international instruments. Museums are committed to observe the principles of international instruments for the protection and promotion of cultural and natural heritage, both tangible and intangible. They also should adhere to the principles of the international instruments for the fight against illicit trafficking of cultural property and should coordinate their efforts in this matter. Museums must also take into account the ethical and professional standards established by the professional museum community. Member States should ensure that the role of museums in society is exercised in accordance with legal and professional standards in the territories under their jurisdiction.
22. Member States should adopt policies and take appropriate measures to ensure the protection and promotion of museums located in the territories under their jurisdiction or control, by supporting and developing those institutions in accordance with their primary functions, and in this regard develop the necessary human, physical and financial resources needed for them to function properly.
23. The diversity of museums and the heritage of which they are custodians constitutes their greatest value. Member States are requested to protect and promote this diversity, while encouraging museums to draw on high-quality criteria defined and promoted by national and international museum communities.

Functional policies

24. Member States are invited to support active preservation, research, education and communication policies, adapted to local social and cultural contexts, to allow museums to protect and pass down heritage to future generations. In this perspective, collaborative and participative efforts between museums, communities, civil society and the public should be strongly encouraged.
25. Member States should take appropriate measures to ensure that the compilation of inventories based on international standards is a priority in the museums established in the territory under their jurisdiction. The digitization of museum collections is highly important in this regard, but should not be considered as a replacement for the conservation of collections.
26. Good practices for the functioning, protection and promotion of museums and their diversity and role in society have been recognized by national and international museum networks. These good practices are continually updated to reflect innovations in the field. In this respect, the Code of

Ethics for Museums adopted by the International Council of Museums (ICOM) constitutes the most widely shared reference. Member States are encouraged to promote the adoption and dissemination of these and other codes of ethics and good practices and to use them to inform the development of standards, museum policies and national legislation.

27. Member States should take appropriate measures to facilitate the employment of qualified personnel by museums in the territories under their jurisdiction with the required expertise. Adequate opportunities for the continuing education and professional development of all museum personnel should be arranged to maintain an effective workforce.
28. The effective functioning of museums is directly influenced by public and private funding and adequate partnerships. Member States should strive to ensure a clear vision, adequate planning and funding for museums, and a harmonious balance among the different funding mechanisms to enable them to carry out their mission to the benefit of society with full respect for their primary functions.
29. The functions of museums are also influenced by new technologies and their growing role in everyday life. These technologies have great potential for promoting museums throughout the world, but they also constitute potential barriers for people and museums that do not have access to them or the knowledge and skills to use them effectively. Member States should strive to provide access to these technologies for museums in the territories under their jurisdiction or control.
30. The social role of museums, along with the preservation of heritage, constitutes their fundamental purpose. The spirit of the 1960 Recommendation concerning the Most Effective Means of Rendering Museums Accessible to Everyone remains important in creating a lasting place for museums in society. Member States should strive to include these principles in the laws concerning the museums established in the territories under their jurisdiction.
31. Cooperation within the museum sectors and institutions responsible for culture, heritage and education is one of the most effective and sustainable ways of protecting and promoting museums, their diversity and their role in society. Member States should therefore encourage cooperation and partnerships among museums and cultural and scientific institutions at all levels, including their participation in professional networks and associations that foster such cooperation and international exhibitions, exchanges and the mobility of collections.
32. The collections defined in paragraph 5, when held in institutions that are not museums, should be protected and promoted in order to preserve the coherence and better represent the cultural diversity of those countries' heritage. Member States are invited to cooperate in the protection, research and promotion of those collections, as well as in promoting access to them.
33. Member States should take appropriate legislative, technical, and financial measures, in order to design public planning and policies enabling to develop and implement these recommendations in museums situated in the territories under their jurisdiction.
34. In order to contribute to the improvement of museum activities and services, Member States are encouraged to support the establishment of inclusive policies for audience development.
35. Member States should promote international cooperation in capacity-building and professional training, through bilateral or multilateral mechanisms including through UNESCO, in order to better implement these recommendations and especially to benefit the museums and collections of developing countries.^{vi}

Notes

ⁱ The UNESCO Recommendation was actually adopted at a session on 17 November, but also bears the date in some records of 20 November 2015, when the General Conference was concluded. The text of the Recommendation is accessible for download via the UNESCO Portal site at http://portal.unesco.org/en/ev.php-URL_ID=49357&URL_DO=DO_TOPIC&URL_SECTION=201.html

ⁱⁱ See note [v] below.

ⁱⁱⁱ This definition is the one given by the International Council of Museums (ICOM), which brings together, at an international level, the museum phenomenon in all of its diversity and transformations through time and space. This definition describes a museum as a public or private non-profit agency or institution.

^{iv} This definition reflects partially the one given by the International Council of Museums (ICOM).

^v This definition partially reflects the one given by Council of Europe Framework Convention on the Value of Cultural Heritage for Society.

^{vi} List of the international instruments directly and indirectly relating to museums and collections:

- The Convention for the Protection of Cultural Property in the Event of Armed Conflict (1954), and its two Protocols (1954 and 1999);
- The Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property 1970;
- The Convention Concerning the Protection of the World Cultural and Natural Heritage (1972);
- The Convention on Biological Diversity (1992);
- The UNIDROIT Convention on Stolen or Illegally Exported Cultural Objects (1995);
- The Convention on the Protection of the Underwater Cultural Heritage (2001);
- The Convention for the Safeguarding of Intangible Cultural Heritage (2003);
- The Convention on the Protection and Promotion of the Diversity of Cultural Expressions (2005);
- The International Covenant on Economic, Social and Cultural Rights (1966);
- The Recommendation on International Principles Applicable to Archaeological Excavations (UNESCO 1956);
- The Recommendation concerning the Most Effective Means of Rendering Museums Accessible to Everyone (UNESCO 1960);
- The Recommendation on the Means of Prohibiting and Preventing the Illicit Export, Import and Transfer of Ownership of Cultural Property (UNESCO 1964);
- The Recommendation concerning the Protection, at National Level, of the Cultural and Natural Heritage (UNESCO 1972);
- The Recommendation concerning the International Exchange of Cultural Property (UNESCO 1976);
- The Recommendation for the Protection of Movable Cultural Property (UNESCO 1978);
- The Recommendation on the Safeguarding of Traditional Culture and Folklore (UNESCO 1989);
- The Universal Declaration of Human Rights (1949);
- The UNESCO Declaration of Principles of International Cultural Cooperation (1966);
- The UNESCO Universal Declaration on Cultural Diversity 2001;
- The UNESCO Declaration concerning the Intentional Destruction of Cultural Heritage (2003);
- The United Nations Declaration on the Rights of Indigenous Peoples (2007).