FOCUS MEETINGS OF THE NETWORK

SCIENCES AND CIRCUS ARTS

Developing strong collaborations with the scientific field since many years, Le Prato - Pôle national des arts du cirque (Lille, France) explores topics at the crossroads of science and circus arts. Building on these fruitful synergies, Circostrada got together with Le Prato to propose a Focus meeting on November 20, 2015 in Lille, entitled: « Conveyors of circus/Conveyors of science: from cartography to the physics of circus ».

CIRCOSTRADA
European Network Circus and Street ArtS

This report was written by Marie Jacolot and coordinated by Circostrada Network

HORS LES MURS

Coordinator of the network, HorsLesMurs is the French National Resource Center for Street Arts and Circus Arts. Founded in 1993 and funded by the ministry of Culture and Communication, it works for the development of these fields through activities of documentation, training, counselling, networking, research and publishing.

Co-funded by the Creative Europe Programme of the European Union

Since 2003, Circostrada Network works to develop and structure the fields of circus and street arts in Europe and beyond. With more than 70 members, it contributes to build a sustainable future for the sector by empowering cultural players through actions of observation and research, professional exchanges, advocacy, capacity-building and information.

FOREWORD

Le Prato, National Center for Circus Arts, has been developing close ties with universities for many years, particularly with Lille 1 University Science and Technology; together and through a series of regular meetings, they explore issues at the crossroads of arts and science. Circostrada has partnered up with Le Prato to capitalize on these fruitful synergies and to organize a Focus Meeting entitled « Science and Circus Arts ». This meeting seeks to compare processes in both fields and use real examples to explore their similarities. How an idea or artistic intent is interpreted and performed? How do principles and processes evolve as ideas bounce back and forth?

Circus artists and scientists are searching for something lying between intuition and action. They use the laws of physics and metaphysics to create art in a quest to push their limits.

Focus Meetings are a new format introduced by Circostrada aiming to examine crosscutting and interdisciplinary themes in partnership with members of the network. Following each Focus Meeting, Circostrada publishes an online critical report both in English and in French.

SPEAKERS

- **Angela Laurier**, Acrobat, Director, Angela Laurier company
- **Dominique Hache**, Espace Culture - Lille 1 University
- **Patricia Kapusta**, Le Prato - National Center for Circus Arts
- **Philippe Baraduc**, Scientific Performance Creator and Artist, Al Kymia company (Belgium)
- **Jean-Philippe Cassar**, University Professor, Vice-President of Culture and Scientific Heritage at Lille 1 University
- **Jean-Charles Le Gac**, Mechanical Methods Engineer at CNAC (National Center for Circus Arts), Châlons-en-Champagne
- **David Scattolin**, Director of *Vous êtes ici*, L'Ouvrier du Drame Company, presented after the Focus meeting
- **Valerio Vassallo**, Lecturer at Lille 1 University, Resident Mathematician at the Cité des Géométries in Jeumont
- **Eric Wolf**, Physics Teacher at Lycée Beaupré, Haubourdin

MODERATOR

- **Marie Jacolot**, Coordinator of *Territoires de Cirque*

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PARTNERS OF THE MEETING

Le Prato - National Center for Circus Arts, Circostrada, HorsLesMurs, Espace Culture of University Lille 1 - Sciences and Technologies, in collaboration with the physics laboratory of the « Beaupré-Haubourdin High School » and CANOPE, with the support of the European Commission.

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OPENING REMARKS

Topics and challenges

Circus artists and scientists are searching for something lying between intuition and action. They use the laws of physics and metaphysics to create art in a quest to push their limits.

The speakers were asked to explore the relationships existing between these two apparently opposed worlds and to highlight common research fields.

The need for imagination in scientific processes

Jean-Philippe Cassar, University Professor, outlines the rationale behind the meeting: *"Science is a learned discipline that starts off with experimentation. It's a certain way of looking at the world. Science teaches me that my reality isn't the reality. Science is a way of experimenting reality. Its tools and experiments are just one vision of reality. Imagination, the need for imagination, is what brings together scientists and artists. Scientist Henri Poincaré clearly explained that imagination has a very important role to play in experimentation."*

"Imagination, the need for imagination, is what brings together scientists and artists"
Jean-Philippe Cassar

FINDING A COMMON GROUND

Two similar worlds?

Bernard Kudlak, founder of Cirque Plume, defines circus as the nostalgia for paradise, the celestial and bright vision described by ancient mythologies.

For the artist Johann Le Guillerm, circus is a place of perspectives because it is built around a circle, the natural shape of a gathering.

Circus and Physics

Circus is an art of movement, skill and balance. Circus artists work with surfaces or objects, using the laws of physics and attempting to push their limits.

The fields of circus and physics share a common vocabulary with words such as bodies, movement, balance, thrust, trajectory, energy and strength. Eric Wolf, Physics Teacher, did not err in carrying out a scientific-based approach with his high school classes. This very curious teacher created a project with Le Prato called *"La physique fait son cirque"* (Physics puts on a show) and has been taking his pupils to see circus shows for four years now. They first saw Secret [1] by Johann Le Guillerm and the Cirque Ici company, before moving on to other shows, to scientifically explore a variety of physics notions in the artists' movement and relationship with objects, such as mechanics, trajectory, static balance, speed and energy, forces and more [2]. Eric Wolf asks *"Who is exerting a force*

The fields of circus and physics share a common vocabulary with words such as bodies, movement, balance, thrust, trajectory, energy and strength

1 Constantly evolving show, one of four parts of the *Attraction* project: http://acasculpture.blogspot.fr/2012/12/johann-le-guillerm-secret-da-telier.html

2 In the show *Celui qui tombe*, Yoann Bourgeois, believes that circus artists are not so much actors who initiate movement as *« {...} vectors who surrender themselves to flows »*. http://www.dailymotion.com/video/x2hqjiu

on whom? What forces come into play for an object to remain motionless? At what speed must one artist jump onto a teeterboard for another to fly up to a predetermined height?". He analyzes the magic of circus with lots of joy, asking the audience, *"What is so spectacular about circus arts? The balancing acts are difficult because artists are fighting the force of gravity. They are putting themselves in extreme situations and that's what makes the show beautiful."*

From ideas to dreams – the role of science and technology in producing circus shows

Apparatus is the fundamental working tool for artists. Ropes, Chinese poles, cyr wheels and trapezes... Apparatus set new physical constraints and impose new movements for the artists who use them. Who is manipulating who? [3]

However, although most artists are able to master a particular apparatus after many years, *" {...} some artists feel too restricted with a traditional apparatus, either physically restricted by the constraints and the repertoire of figures that goes with it - inventing a new apparatus is a promising way for new movements and body positions, or restricted by the image conveyed by some apparatuses and its direct circus connotations, which can sometimes prevent artists from giving it another meaning."* [4]

Apparatus set new physical constraints and impose new movements for the artists who use them. Who is manipulating who?

Building aparatuses – from an artistic idea to stage performance

The CNAC (National Centre for Circus Arts) [5] in Châlons-en-Champagne trains professional circus artists. In addition to its teaching and professional support activities, it has a workshop for building apparatus prototypes and for researching new materials. Jean-Charles Le Gac, Workshop Manager and Construction Engineer at CNAC, has helped create the sets for a dozen circus shows and a number of pieces of circus apparatuses and accessories. He explains the complexity of apparatus design, using the example of Quentin Claude, a young tightrope walker, who came up with a project where the wire could have a variety of angles of inclination and heights, which he calls the rotating dual iron wire [6]. *"A project like this needs a lot of people and a variety of artistic, technical, teaching and administrative skills."* The artist's initial idea is discussed between the various parties involved in the project, particularly for the technical aspects. The question of project viability or how the new apparatus could work on stage is crucial, requiring the work of engineers and technicians. *"Engineers create drawings of the definitive form and perform calculations to define the resistance of materials, in order to determine the size and weight of the apparatus and calculate the cost. This takes place in a limited timeframe as the training program takes place over two years, with eighteen months of manufacturing for the technical team, so that students can present a show with their new apparatus at the end of their training course"*, explains Jean-Charles Le Gac.

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Limits

Circus uses and reinvents a number of industrial, nautical, caving and climbing materials to produce apparatuses or hooks. Some artists closely follow innovations in these fields, but generally, circus productions do not always have the necessary funds to keep up with research in these fields or to initiate specific research into these technical requirements. Circus productions are still predominantly handcrafted. Many circus artists are craftsmen.

3 To find out more, read the article, *Jouet, instrument ou extension de soi*, in *L'agrès: entre apprivoisement et dépassement,* Territoires de cirque, 2011. www.territoiresdecirque.com

4 Jean-Michel Guy in *Les nouveaux agrès* in *L'agrès: entre apprivoisement et dépassement,* Territoires de cirque, 2011. www.territoires-decirque.com

5 http://www.cnac.fr

6 Find out more about Quentin Claude and the rotating dual iron wire: http://www.cnac.fr/cnac-799--

Workers / Craftsmen

Stage technicians as well as all the technical staff surrounding the artistic creative process take part in producing a new work. Valère Novarina, Theater Director, calls them *"drama workers" (ouvriers du drame).* They are real characters who illustrate the horizontal nature of the existing relationships between the professions of artist and technician, which in the circus arts are often one and the same.

The L'Ouvrier du Drame company, presenting *Vous êtes ici*, claims a craftsmanship approach to their shows. David Scattolin, Co-Director of the show, explains that the term "drama workers" confirms the role of *" {...] intuition in creation, fantasy and realism"*, and how limited resources can be an incredible advantage for creativity.

WHEN SCIENCE SERVES AS ARTISTIC MATERIAL OR CREATIVE CONSTRAINT

Many artists use scientific concepts as artistic materials, or attempt to alter the physical conditions in which they perform, in order to create new movements, sensations and images

Many artists use scientific concepts as artistic materials, or attempt to alter the physical conditions in which they perform, in order to create new movements, sensations and images, like Johann Le Guillerm, Jorg Muller [7] or Kitsou Dubois [8].

Science as Poetry

Vous êtes ici [9] is a show that questions the notions of territories, infinity and boundaries during a clown-like lecture on the search for the farmost reaches of the universe. Using an overhead projector, the two "borderline" lecturers take us on a journey through space and time, as far as our imagination can carry us. David Scattolin explains the secrets of the show: "*Having to represent the universe in two dimensions, using the clown... Obstacles were a means to move forward. Choices have to be made and we like working using analogies. Taking the idea of forces (presented by Eric Wolf), the clown expresses forms of tension and the relationship between forces. For example, desire can be expressed inwardly by a form of tension, or disappointment by a form of release."* In essence, it is the physics of emotions... which they developed in particular by reading the book, *Le Cosmos et le lotus* (unpublished in English) by Vietnamese-American astrophysicist Trinh Xuan Thuan. *"He talks about beauty and the relationship with sensitivity and emotions for scientists. The sun is not just a source of life and heat, but also of wonder and astonishment; just like a blue sky, which, beyond its physical characteristics, has a direct influence on our mood."* Trinh Xuan Thuan is a strong supporter of the connection between science and poetry, *"just as others identify the shared abstract thinking as the link between mathematics and poetry, "* concludes David Scattolin.

In essence, it is the physics of emotions...

As Jean-Philippe Cassar shared, performances, in their own way, remind us of the need for imagination in science and the need for chaos and the unexpected in life as a source of creation.

7 Jorg Muller, *C/O* and *noustube*: water movement performances

8 For many years, Kitsou Dubois has been exploring bodies in zero gravity, with the support of the CNES (French National Centre for Space Studies). Kitsou Dubois, *Un dialogue cirque et image: à la recherche de nouveaux outils d'analyse du mouvement du circassien,* Parcours découverte, HorsLesMurs. http://horslesmurs.fr/wp-content/uploads/2015/06/Projet-de-recherche-Cirque-et-image-Kitsou-Dubois.pdf

9 *Vous êtes ici* by l'Ouvrier du Drame was presented after the Focus Meeting as part of Les Toiles dans la Ville. It fit this year's Espace Culture theme of "Maps inventing the world".

10 *Bulles... J'ai fait un rêve étrange...*, show by Théâtre Diagonale.

Scientific shows

Philippe Baraduc and Valerio Vassallo also seek to share this poetry of science: *"Bringing scientific concepts to life using a body or voice, taking them out of textbooks, exercises and tables to see them from another perspective"*, explains Philippe Baraduc, whose background is in science. Cerclo Sapiens is the fourth show that he has produced with the Al Kymia company, in collaboration with mathematician Valerio Vassallo. *"Beyond the beauty, symbolism and familiarity of a circle (the moon, sun, plates, etc.), I needed to scratch deeper under the surface to explore all the possibilities"*, explains Philippe Baraduc. However, these initial mental images are necessary to create a point of reference shared with the audience, before taking it further. It is a way of breaking down the supposed inaccessibility of science.

Valerio Vassallo leads us gently into the poetry of circles and mathematics, taking us ever closer to a limitless science: *"Circles evoke harmony; it would be a polygon when n tends to infinity; a cross-section of a cone, a plane intersecting a cylinder, etc. It is a shape that comes up everywhere in mathematics and we could spend a lifetime exploring it. In mathematics, objects can be considered from a variety of perspectives."* This final remark takes us back to circus and the definition of circus given by Johann Le Guillerm (see page 4).

CREATIVE PROCESSES

Similarities

The speakers agreed that scientific processes and artistic creation have things in common. As **Philippe Baraduc** summarises, *"In both science and arts, we research, experiment, explore, look at multiple points of view, compare, move towards the unknown, open a door and see another ten open in front of it."* Valerio Vassallo uses Henri Poincaré's image from The Psychology of Invention, where he compares research to plowing a field, reminding us not only of the importance of work and absorbing scientific concepts, but also the somewhat "chaotic" dream that guides the researcher's intellectual journey. Finally, the mathematician mentions the notion of *"serendipity"*, which he defines as a *"happy coincidence"*, and the notion of *"free-floating attention"* discussed by Freud; both ideas allow researchers and artists to keep up their curiosity and ability to bring together ideas. It is in this state of mind that Valerio Vassallo worked with the Théâtre Diagonale company, on the poetry of soap bubbles [10].

"In both science and arts, we research, experiment, explore, look at multiple points of view, compare, move towards the unknown, open a door and see another ten open in front of it."
Philippe Baraduc

Renaissance

This period in history when researchers were also artists and science and arts worked together to promote knowledge.

The Renaissance period is described as an age of great intellectual and artistic advances. It is the theme chosen by Lille 3000 this year. Valerio Vassallo talked fondly about this period in history when researchers were also artists and science and arts worked together to promote knowledge. He also adds, with a touch of humour: *"Creative processes take you back to childhood. It's like going from doing homework to building Meccano or messing around with friends. This mix of activities helps keep us young. Everyone says we need to stay young at heart, but how? Now that's something no one tells us!"*

Jean-Philippe Cassar closed the meeting with an urgent plea, almost a resolution: at the end of the day, no matter what, we have to keep moving.

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www. circostrada.org

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