1. Qualitative information on the project proposal

Predicting the evolution of mythological symbols

"It is not the strongest of the species that survives, not the most intelligent, but the one most responsive to change' – Charles Darwin

Mythological symbols can be found in all time periods and cultures, where they serve as a vessel for various religious practices. Intriguingly, many ancient mythological symbols are still used in modern time, but their appearance, meaning and use have often changed markedly. Such changes have occurred due to shifts in ideology, personal taste, modes of production and available technology, and provide a means to investigate how cultures evolve.

While much is known about the factors that have driven past transitions in the use of mythological symbols, there are virtually no predictions about how such symbols may develop in the future. Insights and methods from evolutionary biology may allow us to do exactly that: to investigate how the factors that have shaped changes in mythological symbols may shape the form and function of these symbols in the future. Such predictions of how mythological representations will evolve may give us a glimpse of how cultures and our society as a whole may develop.

An example of such an ancient mythological symbol that has changed over time is the Löwenmensch (lion-man) sculpture (dated *ca* 36.000 B.C.). This lion-man sculpture is one of the oldest known depictions of a being that does not exist in nature. This lion-man figure has changed over time in representation and it has been affected by cultural exchange and appropriation. Derivatives of this creature can be found in classic Egyptian (Sekhmet) and Greek culture (Hercules wearing the skin of the Nemean lion), but also in modern pop-culture (e.g. the character Lion-O in the animated series ThunderCats). The use of mythological symbolism in a secular age might seem paradoxal, but nowadays mythological symbols are often found in the domain of pop-culture, where they function as contemporary references to the supernatural.

At first sight, transitions in symbolism and evolutionary changes in nature appear to be very different processes, but there are many parallels between these two phenomena. Similar to the 'survival of the fittest' as proposed by Darwin, symbols that survive (or are adapted in response to) changes in the environment will be most likely to persist in the future. Especially symbols that have an important function in society are likely to survive. For some symbols, this may mean that they will remain virtually unchanged for prolonged periods, but others may undergo rapid changes in response to shifts in culture or ideology. Speculating about the evolution of mythological symbolism is not only interesting from a speculative art perspective, but also the scientific field of evolutionary biology is likely to benefit as the research project may generate novel predictions and hypotheses about evolutionary processes in nature, especially regarding the role of culture as a driving force of evolutionary change.

Evolutionary modelling (i.e. making simulations regarding the future characteristics of a system as a result of selective pressures from the environment) is an extremely useful technique to predict how traits or characteristics will change in response to changes in the environment. This method is successfully used in several scientific fields including biology (e.g. to predict how animals will adapt to climate change) and economy, but it may also be a powerful tool for speculative art projects.

In this research project – where we will work on the interface between art and science – we will combine the fields of speculative artistic research and image making with evolutionary biology to project future forms of a classic mythological symbol. For this, we will (a) create a photographic timeline showing the change from the original use of a mythological symbol (like in the lion-man example described above) towards its current form in different cultures, (b) speculate about the future forms of this symbol using evolutionary modelling, and (c) visualize the outcomes of these models using 3D-rendering techniques.

For the evolutionary modelling, we will use individual-based simulation techniques that are normally used to predict the evolutionary dynamics of animal traits in natural systems. Using this technique, we will simulate how the form of the mythological symbol changes according to various evolutionary scenarios. The evolutionary modelling will take place in the lab of Dr. Martijn Hammers at the Groningen Institute for Evolutionary Life Sciences. At the lab, we have the opportunity to discuss and collaborate with excellent evolutionary modelers (e.g. Dr. Thijs Janzen, Dr. Hanno Hildebrandt and Prof. Franz Weissing) and have the Peregrine high performance computing cluster (a 'supercomputer' with 5740 cpu-cores and 220000 CUDA-cores) at our disposal to perform the evolutionary simulations. One of the 3D renders will be produced as a tangible 3D-printed object. This object will be part of a photographic intervention, where this speculative future object will be brought back to the location where the ancient symbol from which it is a derivative has most likely originated. By doing this, we symbolically make a synthesis of time and space, and speculate where the chain of cultural objects started and where it is heading to.

The outcome of this project will be an exhibition in the form of an installation; the installation will consist of prints of 3D rendered objects, one tangible 3D printed object, a photographic intervention with the 3D printed object and an essay that will reflect on the research. Our aim is to show the installation in a context where art and science meet. One of the possible venues is Doornburgh – Buitenplaats voor Kunst en Wetenschap in Maarssen. In addition, we will show the works in an art context; the work will be on show in Gallery DudockdeGroot in Amsterdam, and we will show a preview of the work at Unseen 2020, a contemporary art fair in De Westergasfabriek in Amsterdam. Further, we will be in contact with investigative journalists from *De Correspondent* (Thomas Oudman and Isabelle van Hemert) about the production of an article about the future evolution of ancient symbolism and its role in our society.

This combination of artist and scientist is ideally suited to make this project a success. Daan Paans is a visual artist that uses a combination of a documentary approach, thorough artistic research and various media (e.g. photography, sculpture, 3D-printing) to investigate how representations of the future and the past influence our world view. Paans' works are frequently on display at exhibitions (e.g. *FOAM, UNSEEN, Cobra Museum*) and have appeared in e.g. *Vrij Nederland*, *De Volkskrant* and *NRC Next*. Paans' work has been nominated for several prizes and he has been selected as *FOAM Talent Photographer*. Dr. Martijn Hammers is an evolutionary ecologist who works at the University of Groningen at the Groningen Institute for Evolutionary Life Sciences, where he teaches and conducts research on evolutionary processes and animal behaviour. Hammers has successfully collaborated with artists previously, for example for the Bio Art and Design Award (NWO) and for a theatre show 'De Balts' with theatre makers Mirthe Dokter and Tim Hammer. He has published over 25 scientific articles in prominent scientific journals, including *Nature Communications*, *Evolution* and *Journal of Evolutionary Biology* and was awarded a VENI fellowship from the Netherlands Organization for Scientific Research for his research on the interaction between sociality and the evolution of ageing.

Time schedule

Activities in 2020	May	June	July	August	September	October	November	December
Case-study research								
Research for visual material								
Visits to the Groningen Institute for Evolutionary Life Sciences								
Applying evolutionary modelling on the visual material								
Creating 3D renders								
Printing 3D renders								
Photographic intervention								
Designing installation								
Writing of essay								
Exhibitions								