



HYBRIDA

D1. 1. Mythological and artistic representations of chimeras and hybrids

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Embedding a comprehensive ethical dimension to organoid-based research and resulting technologies

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Table of Contents

1. INTRODUCTION	3
1. 1. About HYBRIDA	3
1. 2 About this deliverable	4
2. WHO'S WHO AMONG THE MYTHOLOGICAL CHIMERAS AND HYBRIDS?	5
2. 1. Introduction	5
2. 2. Chimeras as monsters	8
2. 2. 1. Chimera and Bellerophon	8
2. 2. 2. The Sphinx and Oedipus	10
2. 2. 3. Medusa and Perseus	13
2. 2. 4. Echidna and Argus	15



2. 3. Some observations about chimeric monsters and related heroes	14
2. 4. Chimeras as benefactors	
2. 4. 1. Griffins	17
2. 4. 2. Centaurs	18
4. WHAT CAN SCIENTIFIC CHIMERIZATION LEARN FROM MYTHOLOGY?	19
APPENDIX 1. The gender dimension of the monstrous and its impact on reproductive myths from ancient Greece to post modernity	22
APPENDIX 2. Categories and types of sources consulted to identify relevant mythological and artistic representations of chimeras and hybrids	26



1. Introduction

1. 1. About HYBRIDA

The HYBRIDA project is a 3-year project, funded by the Horizon2020 framework program. The main aim is to build a comprehensive ethical dimension for organoid-based research and resulting technologies¹.

Organoid research comes with ambitious promises of revolutionizing biomedical research in the future and with it our view of the human organism and life itself. As such a train leaves the station, it is vital that ethics not only follows, but is there on the train, shaping the journey as it takes place.

An organoid is an organized cluster of cells generated *in vitro* from different kinds of stem cells (either pluripotent or derived from some types of adult tissue) through the use of 3D tissue culturing methods. By using organ-specific cell types, such entities might serve as “three-dimensional culture models” mimicking the structural and functional properties of different organs, both human and non-human such as the retina, heart, brain, intestine, kidney, pancreas, liver, inner ear and skin.

Following Roman times, all entities have been categorized and regulated either as persons or as things (subjects or objects). Organoids, however, are entities, and organoid research and organoid-related technologies are examples of disruptive research and innovation that challenge this conceptual, epistemological and regulatory dualism. That is, the dualistic normative framework pertaining to health and life science research is disrupted by three different kinds of uncertainties.

First, *conceptual uncertainty (ontological uncertainty)*: How should one conceive of entities that cannot be categorized as either persons or things? What *are* they? How do we *know* the characteristics of these entities called organoids?

Second, *epistemological and methodological uncertainty*: How do we address forms of uncertainty that cannot be evaluated through the use of statistical methods, i.e. risk assessment? This is particularly pertinent where organoids are intended for personalized or precision medicine, where the number of research subjects with a certain characteristic is too low for randomized controlled trials or other statistically based experiments. As precision medicine and new technologies emerge, evidence-based medicine is challenged to find a new footing. Epistemological uncertainty comes in two kinds, which can be categorised as qualitative, or strict, uncertainty and ignorance or non-knowledge. Qualitative, or strict, uncertainty is a form of uncertainty where possible positive and negative outcomes can be identified in advance but, contrary to risk assessments, the statistical magnitude of each possible outcome cannot be estimated. By contrast, ignorance or non-knowledge represents forms of uncertainty where neither possible outcomes nor the statistical magnitude of each can be identified in advance. In order to develop

¹ The HYBRIDA description in this section is reproduced from the project description (HYBRIDA Consortium, 2020, p.2).

ethically and socially robust ways of assessing the effects of organoid research and related technologies, there is a need to include these additional forms of uncertainty in the Health Technology Assessment (HTA).

Third, *regulatory uncertainty*: This uncertainty emerges because parts of regulatory frameworks concerning the rights and duties of persons have been merged with elements of regulation dealing with the stewardship of objects or things. These forms of uncertainty are of particular importance.

HYBRIDA will address how these three kinds of uncertainty arise in organoid research and will develop a conceptual and regulatory framework able to overcome this dualism between persons and things. From this follows the need to communicate the potential and possible pitfalls of organoid research in ways that convey realistic, instead of hyped, scenarios.

1. 2. About this deliverable

In the project description the relevance of looking into mythological and artistic representations of chimeras and hybrids are made with reference to the fact that these two concepts or metaphors, i.e. hybrids and chimeras, have been in use in different cultural and religious contexts for millennia, in Christian, Egyptian, Greek, Indian, Nordic mythology and in epic narratives, ² as well as in painting since the beginning of humanity. ³ Furthermore, the “mythic accretions gathered around the term chimera” and these narratives’ “grip on the modern imagination” is prevalent not solely in non-scientific settings; they have also “made their way deep into biology”. ⁴ For example, in 1961, A. K. Tarkowski published a paper in *Nature* entitled, ‘Mouse chimaeras developed from fused eggs’ (*Nature* 190: 857–860). Thirty seven years later, he acknowledged the impact of these myths in chimera research by stating that mouse chimeras were “in a way a bow and a tribute paid by experimental embryology to ancient mythology which created monsters of dual, triple or even multiple origin”. ⁵ Consequently, the mixture of repulsion, fear and “fascination with the fantastic”⁶ that certain parts of organoid research and the creation of artificial hybrids and chimeras, or chimbrids, ⁷ receive among the public outside science, cannot be fully explained by just pointing to people’s ignorance. These perceptions and reactions seem to be themselves - at least partly - nurtured by the same ancient myths, images and artistic representations that have

²Kuře, J. (2009). Etymological background and further clarifying remarks concerning chimeras and hybrids. In J. Taupitz and M. Weshka (Eds.). *CHIMBRIDS – Chimeras and Hybrids in Comparative European and International Research. Scientific, Ethical, Philosophical and Legal Aspects*. Springer Dordrecht Heidelberg London New York, pp. 7-20, p.12.

³ Chippindale, C. and Tacon, p.S. C. (1998), (Eds.), *The Archaeology of Rock-Art*, CUP, 1998.

⁴ Hinterberger, A. (2017). Marked ‘h’ for human: Chimeric life and the politics of the human. *BioSocieties* Vol. 13, 2, 453–469.

⁵ Tarkowski, A. K. (1998) Mouse chimaeras revisited: Recollections and reflections. *International Journal of Developmental Biology* 42: 903–908, p.904.

⁶ Warner, M. (2007). *Monsters of Our Own Making: The Peculiar Pleasures of Fear*, p.243.

⁷ Taupitz, J. and Weshka, M. (2009). *CHIMBRIDS – Chimeras and Hybrids in Comparative European and International Research. Scientific, Ethical, Philosophical and Legal Aspects*. Springer Dordrecht Heidelberg London New York.



impacted the conceptual and narrative landscape of organoid and chimera research. Or to phrase it differently; lay people tend to make use of analogies in order to understand new concepts and procedures with which they are unfamiliar, as is the case with organoid research. These are considerations, we believe, that justify the inclusion in this project of a brief account of mythological and artistic representations of chimeric and hybrid entities. We need to understand how these narratives and metaphors are used and misused in scientific discourse as well as among lay people, thereby facilitating the democratization of science and strengthening the public capacity of understanding the consequences of innovative research.

2. Who's Who among the mythological chimeras and hybrids?

2. 1. Introduction

In a fascinating paper from 2006 D. J. Schaub wrote:⁸

“While both the pagan and the modern chimeras could be said to be man-made, the fundamental difference is that theirs were made by poetry, ours by science and technology. If ‘the wisdom of the ancients’ is a phrase that has any truth, then it might be worthwhile to consider whether the poetic chimeras have anything to tell us about our new scientific versions, especially since we are in something of a quandary as to whether we should welcome or dread the coming of these biotechnological marvels”.

In other words, before it became a technical artefact, chimerism was a man-made myth; thus, in both respects, a construction subject to continuous metamorphosis. The word *Chimera* comes from the Latin *Chimaera*, borrowed from the Greek myth of *Khimaira*, which again was borrowed from the Sanskrit *Kimeros*, deformed from *Shramana* meaning the *enlightened*. But the shifting of metaphors relies on the idea of a fantastic being of divine origin⁹.

Then, in the Theogony of Hesiod, it becomes a monster with three animal heads: lion for young age, goat for maturity, and a snake for menopause or old age, illustrating the three ages of female fecundity¹⁰. The legend of her death illustrates the passage from matriarchy to patriarchy, and the abandonment of the cult of Chimera. In the Achaean myth, she becomes the daughter of two monsters, Typhon and Echidna, evoking a monstrous world preceding the ordered world of Olympia.

⁸D. J. Schaub (2006). Chimeras From Poetry to Science. The national catholic bioethics quarterly: 29-35.

⁹ See for instance: Martial Guedron (2020), Les monstres: creatures étranges et fantastiques de la préhistoire à la science-fiction – Introduction, Beaux Arts Editios, Paris

¹⁰ We take this example from an intervention of Françoise Héritier “L’homme artificiel au service de la société » (13 October 2006), Collège de France, Paris.



She represents the chaos of the beginning of the universe. Bellerophon, by her murdering, is supposed to open the world of science and knowledge, or rationality, and to disincarnate Chimera and her unlimited hubris. Since the Middle Ages, the monstrous is represented by a profusion of artistic representations of chimeras.

What biological sciences operate on the myth is a negation of corporeal reality and a foreclosure of sexuality. The biologist of postmodernity produces chimeras biotechnically, uncertain beings, which appear to the outsider at the edge of the impossible and the monstrous. This problematic is renewed in the 19th century by B. Bolzano, G. Frege and F. Brentano, asserting that the chimeras of the Middle Ages did not signify any object, even imaginary. According to W. Ockham in his *Summa Logicae*, they are “empty references”, basically “entities made of incompatible parts”.¹¹

What is at stake is the importance of the literal signification of what a chimera means when it is actualized in today’s current scientific metaphors, by using it as a scientific concept, since metaphors are conceptualized by geneticists and biologists, who refer to mythology as a mere subtext. As stated by Reynolds: “Nearly always when we talk about abstract concepts, we choose language drawn from one or another concrete domain.”¹²

We suggest nonetheless that a filiation between the metaphor and its reuse should not be neglected.

The meaning of chimera in science uses the idea of a mix by analogy, so that a chimera is basically a single organism containing the populations of genetically distinct cells originated from two different zygotes. These terms replace the narratives of the reproductive function of the feminine and the masculine in our human organisms.

This displaces the limit of what is possible in evacuating the place of the impossible. It becomes for the public the revelator of the transgression of an affective limit to the desire of becoming demiurges (creators), commonly called “sorcerers’ apprentices”. What was once impossible is now evacuated by biotechnologies and comes back in the symbolic language.

The word Chimera has reinvested science discourse.¹³ It uses the meaning rhetorically to disguise its interest in the artificial production of a “non-human human living being”. In other words, the development of synthetic biology reactivates and displaces the fundamental meaning of the narratives created by mythologies. The creators of human-animal chimeras are thus sometimes represented as mad scientists, when they express their desire to act as the editors of the genome, or even as the “authors” of an

¹¹ See “Ockham’s Theory of Propositions: Part II of the *Summa Logicae*” (2011), St. Augustines Press.

¹² A.S. Reynolds, “The Third Lens – Metaphor and the creation of modern cell biology”, Chicago University Press, 2018, p.31.

¹³ The word chimera in science is a metaphor as suggested by E.F. Keller in her “Metaphors of Twentieth Century Biology”, 1995, Columbia University Press, or in T.L. Brown “Making Truth - Metaphor in Science”, 2003, University of Illinois Press, and is presented as a function in J.G. de Ricqlès “Les fonctions des organismes aux artefacts”, PUF, 2010. We also refer to the book of M. Botbol Baum and H. Atlan “Des embryons et des hommes” (PUF 2007) where the authors address reproductive techniques and their impact on women’s self-representation, especially in the chapter “L’embryon délocalisé de l’utérus à la cité”.



enhanced genome, disturbing the remains of what is considered, because of its complexity, to be an immutable law, or a mystery in popular culture. See for instance “The Island of Lost Souls “, by HG Wells. In this paradigmatic science-fiction story, a famous scientist on a remote island performs illicit experiments that cannot be accepted among humans. He manipulates animals, dreaming to give them the capacity to think, that would bestow them the appearance of humanity, as well as a very human sense of ill-being. This is a way out of the natural determinism of instincts, and the beginning of evil in a simulacrum of human existence, which raises the impossible question of what a human is, by dissolving the idea of a human essence in revealing the evolutive becoming of all biological entities. This tension is again a conflict of narratives between those who want to believe in immutable beings that could be defined once and for all, and those who describe biological facts denying this immutability. The goal here is to reconcile values that modeled our civilization and facts. We should not forget nonetheless that science and metaphors evolve, even for a realist such as Van Frassen:

“Science aims to give us, in its theories, a literally true story of what the world is like, and acceptance of a scientific theory involves the belief that it is *true*. “¹⁴

Turning myths into concepts through metaphors in biology reveals, along human history, the transformation of a desire of immortality as linked to the idea of truth. The promise of a possible objective truth, through the advance of science, gives humanity the capability to act and not be determined by its biological destiny, realizing partly their desire for eternity. This new scientific form of struggling against death consists, more or less consciously, in attempting to rewrite the book of life and eliminate the mythical head of snakes (the third of Hesiod’s Chimera, symbolizing death), which so far has failed, like all other narratives. The reversal of the impossibility of the chimera to realize this desire is transformed into a possibility to fabricate man, that also aims at getting rid of the need of feminine corporeity to reach immortality. This is what happened by relocating embryos from the womb to a Petri dish, as one of the authors have shown elsewhere.¹⁵ If female bodies bring birth, they have also been considered to be responsible of death, for only a born being can die. This narrative has been rewritten in most mythologies and philosophical texts, since Sarah in the Bible and Diotima (the midwife in Plato ‘s Banquet, who can bring bodies to life, while her philosopher son Socrates can give birth to eternal ideas, which transcend death of the flesh). This division of male and female reproductive roles and hierarchy is still inscribed today in our mythical representations.

We could say that the metaphors about the genome lead to metaphorical organs, transforming text into conceptual models that escape the comprehension of the lay public. If metaphors act as selective filters of interpretations, they highlight desired aspects and obscure some others, without necessarily an intention to hide consequences to the public but leading to avoid addressing the unknown.

We must take this issue seriously to avoid transforming regulation into a metaphorical practice, since it is rare for a regulatory framework to be created *de novo*. It always draws an analogy between something new in science and something that is already regulated. The danger here is to extend an existing framework instead of addressing the specificity of organoid research.

¹⁴ B. van Frassen, “The Scientific Image”, Oxford University Press, New York, 1980

¹⁵ Botbol Baum and Atlan, Des embryons et des hommes, *op. cit.*





These paradigmatic representations are hypothesis in myth that require a shared language game, rather than an immediate rational understanding. Metaphors are thus part of our fast-evolving culture and orient our moral choices. The original emotions of the public, facing the counterintuitive propositions of genetic editing, reveal some indeterminations and uncertainties of the scientific discourse itself, since metaphors precede conceptual definitions. The changing narratives of the conflicting cultures using the recycled metaphors of myths, re-interpreted by science, aim to describe innovative possibilities that remain hypothetical and can be perceived as monstrous, in their rewriting of myths as mere functions. Nonetheless, metaphors play a central role in the development of a new scientific subject like organoids but it is also a sign of the immaturity of the field on conceptual grounds.

2. 2 Chimeras as monsters

Following Schaub's advice above, two preliminary observations about poetic chimeras might serve as a starter. First, the most prevalent kind of representation of chimeras in mythology is in the form of life-threatening *monsters*. Second, the mythological narrative and visual representations of these monsters are connected to different *heroes* and their destiny.

2. 2. 1 Chimera and Bellerophon

The most well-known mythological representation of such a monster is, as already mentioned, the one bearing the name *Chimera*; the monster from Lycia, "lion in front, snake behind, and she-goat in the middle".¹⁶ Allegedly, Chimera was the child of Typhon and Echidna, and the mother of the Sphinx.¹⁷ A stable component of the myth, since Homer, is that she was breathing fire from the she-goat's head.¹⁸ The hero to which Chimera was linked is Bellerophon, a link which proved to be fatal, since Bellerophon killed Chimera and thus saved the people of Lycia to whom this composite monster had done terrible things.¹⁹ But the story does not end with the killing of Chimera; it continues with the fall of Bellerophon (more about this below).

¹⁶Hom. Il. 6, 181 = Lucr. 5, 905.

¹⁷Phix: Hes. Theog. 319-326.

¹⁸For this, see Ov. Met. 9, 647 and Apollod. 2, 31.

¹⁹D. Leeming. The Oxford Companion to World Mythology. OUP: Oxford, 2005. Last accessed, June 21, 2022.





Cup (kylix) with Bellerophon Riding Pegasus fighting the Chimera, Culture -Greek, mid-6th century BCE, Musée du Louvre, Paris, France (with permission from ARTstor).



Chimera of Arezzo, Culture –Etruscan, Museo archeologico di Firenze, Italy (with permission from ARTstor).

2. 2. 2. The Sphinx and Oedipus

The second mythological monster already alluded to is the daughter of Chimera, the Sphinx.²⁰ She had the body of a lion, the head and breast of a woman, eagle's wings and, in some, representations, a

²⁰Phix: Hes. Theog. 319-326.





serpent's tail. According to Greek mythology she was sent by the gods to punish the people of Thebes with a plague for the reason of ancient crime. While in ancient Greek narratives she was a monster swallowing everybody who failed to solve her riddle, in Egyptian myth she was a symbolic guardian and protector of the pyramids.²¹ The hero linked to the ancient Greek version of the Sphinx was Oedipus, who managed to solve the Sphinx's riddle, break her hold on the people of Thebes, and thereby, also, provoke her self-inflicted destruction.²² But the story of Oedipus does not end with him entering Thebes as a savior and the city's new king; it continues with the dramatization of his own fall and destiny.

The ancient Greek playwright Sophocles dedicated two of his plays to Oedipus' tragic fall. In Aristotle's view, Oedipus' misfortune was caused by some sort of error (*hamartia*).²³ Since he wrote these lines, and notably, with reference to Sophocles' play *Oedipus Tyrannus* – “the finest tragedy”, according to Aristotle - the meaning of hamartia has been the subject of great controversy. And competing interpretations ranging from purely epistemological forms of fallibility such as ‘mistake of fact’, ‘ignorance of fact’, ‘error of judgement’, ‘error due to inadequate knowledge of particular circumstances’ to full-fledged forms of moral failure such as ‘moral error’, ‘moral defect’, ‘moral flaw’, ‘moral weakness’, ‘defect of character’ and ‘tragic guilt’ have been suggested.²⁴ There are strong reasons to believe that the broad variety of interpretations of the hamartia clause mirrors the variety of tragic plots and plays Aristotle had at his disposal when he wrote his small book about epic, tragic and comic poetry, the *Poetics*.²⁵ Within the present context, this is highly relevant, because the mythological heroes referred to in this report, fell, almost all, into misfortune because of some sort of epistemological or moral error committed – either by themselves or others implicated - *after* they had conquered the monster.

²¹The Riddle of the Sphinx, World Book: [Mythic Monday: The Riddle of the Sphinx | World Book](#). Last accessed, June 21, 2022.

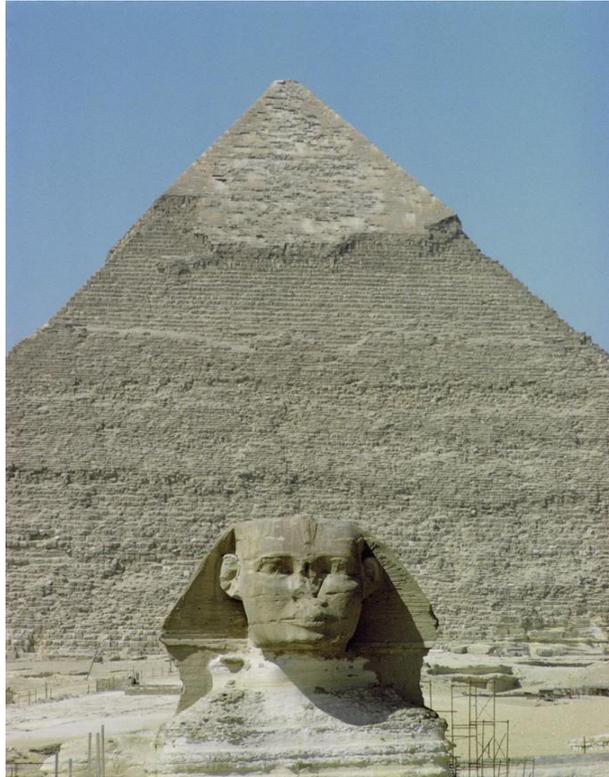
²² Leeming, 2005. Last accessed, June 21, 2022.

²³Aristotle, *Poetics* 53a13-17.

²⁴ Solbakk, JH. Therapeutic doubt and moral dialogue. *Journal of Medicine and Philosophy*, 2004; 29(1): 93-118.

²⁵Solbakk, 2004, p.147.





Great Sphinx, with likeness of the Pharaoh Khafre (Chefren), head, with the Pyramid of Khafre in the background, Culture – Egyptian, Date - c. 2520-2494 BCE (with permission from ARTstor).



Sphinx with the Head of a Falcon, Culture – Egyptian, Date - c. 1250

BCE, British Museum, London, United Kingdom (with permission from ARTstor).



Sphinx of the Naxians, Culture – Greek, Date – 560 BCE, Museum of Delphi, Greece, (with permission from ARTstor).

2. 2. 3. Medusa and Perseus

The third composite monster of a female nature is Medusa (Ancient Greek: Μέδουσα, which means guardian, protectress). In many representations she is depicted with wings and instead of hair her head is inhabited by poisonous snakes. Furthermore, gazing into her eyes would turn the seer into stone. According to tradition she was beheaded by Perseus, who then used her head as a weapon to turn onlookers to stone.



Head of Medusa, Culture - West Greek, Date - 6th century B. C.
The Metropolitan Museum of Art (with permission from ARTstor).



Medusa, by [Michelangelo Merisi da Caravaggio](#),
Galleria degli Uffizi, Florence, Italy
(with permission from ARTstor).



Perseus, by Benvenuto Cellini,
Date – 1545-1553, Museo
nazionale del Bargello (Florence, Italy),
(with permission from ARTstor).

The winged horse Pegasus was the offspring of Medusa and sprang out of his mother when Perseus beheaded her. He was tamed by Bellerophon and flew with him to kill Chimera.



Pelike showing Bellerophon mounted on
Pegasus fighting the Chimaira, Date –
c. 450-440 BCE, Musée du Louvre, Paris,
France (with permission from ARTstor).

The fall of Bellerophon came as a result of his attempt to fly to the top of Mount Olympus using Pegasus. “This angered Zeus, who sent a gadfly to sting the winged horse, causing the animal to throw Bellerophon, who fell to the earth and became a disillusioned, lame wanderer”.²⁶

²⁶ Leeming, 2005. Last accessed, June 21, 2022.





2. 2. 4. Echidna and Argus

Échidna (Ancient Greek: "Ἐχιδνα) was another composite female monster; half snake, half woman. She was "introduced into Greece due to the influence of Near East narrative art and iconography".²⁷ The description of her as a beautiful young woman whose lower part was a huge and terrible serpent originates from antiquity. As already mentioned, Chimera was her daughter. In addition, she was the mother of several other monsters, as e. g the two-headed dog, Orthrus, and the nine-headed sea monster, Hydra. As other female monsters her fate was to be killed. Her killer was Argus, whose byname was Panoptes (Greek: "All-Seeing"). This name derives from the hundred eyes that were spread all over his body.²⁸



Echidna, painted on a terra cotta vessel, Date - VII B. C., Greek Orientalizing Period; Mainland Greece, The Archive for Research on Archetypal Symbolism(with permission from ARTstor).

²⁷ Graf, F. (Columbus, OH) "Echidna" in: Brill's New Pauly. Last accessed, June 21, 2022.

²⁸Argus. Greek mythology. Britannica. Last accessed, July 11, 2022.





Echidna by Pirro Ligorio, 1555, Parco dei Mostri (Monster Park), Lazio, Italy.

On behalf of Hera, the wife of Zeus, the all-seeing Argus was keeping watch over Io, one of Hera's priestesses, so as to hinder Zeus from continuing his love affair with her. But Zeus sent his son Hermes to slay Argus and liberate his mistress, whom Zeus had transformed into a cow so as to disguise her from his jealous wife.²⁹



Argus the hundred-eyed, terra cotta vessel; Date - ca. 500-475 B. C., Musée du Louvre, Paris, France (with permission from ARTstor).

2. 3. Some observations about chimeric monsters and related heroes

Before turning the attention to mythological representations and narratives of chimeras of the opposite kind, i.e. of chimeras as human benefactors, some observations about chimeric

²⁹Argus. Greek mythology. Britannica. Last accessed, June 21, 2022.





monsters and their related heroes of relevance within the present context is warranted. First, some of these chimeras were conceived of as guardians and protectors of holy sites, while others were conceived of as threats to human life and human flourishing. Second, the monster/hero dialectic might generate different outcomes; e. g. the death of the monster might save lives as in the case of Bellerophon and Oedipus, the dead monster might turn into a useful weapon in the hands of the hero (Perseus with the head of Medusa), the hero's success might turn into hybris as happened with Bellerophon, or the hero's success might end in tragedy caused by some sort of epistemological or moral blindness thus imitating the fate of Oedipus Rex.

2. 4. Chimeras as benefactors

As indicated in the previous paragraphs, ancient mythology (Greek as well as other mythologies) are replete with narratives and artistic representations of chimeras and hybrids as monsters, i.e. as threats to divine order and human flourishing.

2. 4. 1. Griffins

However, this is not the whole story; griffins, for example, are portrayed as majestic figures and guardians of holy sites and of different forms of priceless human property. Representations of griffin-like hybrids are found in Ancient Iranian and Ancient Egyptian art dating back to before 3000 BC³⁰, as well as in Christian art. The combination of a beaked head and four legs and body of a lion, symbolized the admirable capability of strength, watchfulness and courage.



Lion-Griffin Glazed tile, Palace of Darius I, Susa, Iran, Date - 522-486 B. C, Musée du Louvre, Paris, France (with permission from ARTstor).



Guardian Griffin, Emilia, Northern Italy, Date - 1150-1175, The Cleveland Museum Of Art (with permission from ARTstor).

³⁰[https://www.newworldencyclopedia.org/entry/griffin_\(mythology\)](https://www.newworldencyclopedia.org/entry/griffin_(mythology)). Last accessed, July 11, 2022.

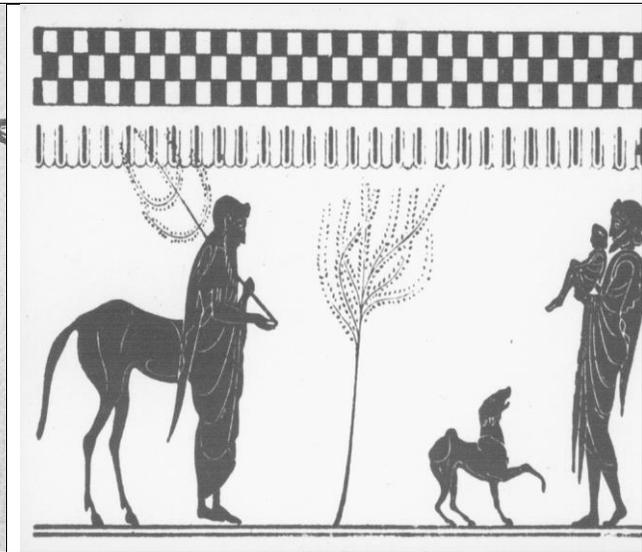


2. 4. 2. Centaurs

The centaurs were composite creatures combining the body of a horse and that of a man. The dominant narrative was that of a wild and lawless creature unable to overcome its animal passions. Chiron, however, represents the exception that confirms the rule. He is the only centaur whose representation is in the form of a full human body in combination with the hindquarters of a horse. What, in addition, makes him different from other centaurs is that he is fully dressed, something which signals a nature closer to humans and to human behavior than to that of animal-like monsters. This is also the core narrative throughout Greek mythology; Chiron as the wise and gentle advisor, instructor and tutor in hunting, music, and several other fields, including *medicine!* According to tradition Aesculapius - the god of medicine - who was the child of Apollo and Keronis, was left in Chiron's caring custody. And since Chiron's foster father Apollo had taught the young centaur the art of medicine, tradition also made Chiron's medical knowledge and teaching the origins of Aesculapius' healing power.³¹ Also Chiron met his death, but not because of his own hamartia (error or fallibility), but according to two competing narratives; either because of an accidental injury caused by Hercules, or because of his own self-sacrifice to save Prometheus from Zeus' wrath.³²



The centaur Chiron, design on an Attic amphora in Munich, photomechanical reproduction, US National library of medicine (with permission from ARTstor).



Peleus consigning Achilles to Chiron, Date - 520-500 B. C., British Museum, London, UK (with permission from ARTstor).

Schaub says about this narrative: "How oddly insightful this ancient account of the origins of medicine seems, now that science looks to chimeric creatures to reveal the mysteries of our biological functioning

³¹<https://www.newworldencyclopedia.org/entry/centaur>. Last accessed, July 11, 2022.

³² Centaur, " *The Compact Edition of The Oxford English Dictionary* (Oxford: Oxford University Press, 1971).





and to provide therapies for disease [...] Chiron is a model of the symbiotic working together of man and his most domesticated animal partner (the only rival to the horse in this respect would be the dog) [...] The vision of Chiron brings us back to the promise of scientific chimerization. Much of our contemporary chimeric research might be understood as an extension of domestication: the project of adapting life forms for the use and advantage of man”.³³

3. What can scientific chimerization learn from mythology?

To fear chimeric research is not irrational; rather it is cultural. That is the first take home message. Second, mythology is replete with representations and narratives about chimeric beasts and monsters representing a threat to human life and flourishing. Likewise, scientific chimeras might become life-threatening. Third, scientific chimeras need to be controlled and tamed as was the case with the poetic chimeras of antiquity. Fourth, in the same way as the ancient heroes needed guidance so as to avoid the pitfalls of epistemological and moral failure, also today’s heroes, i.e. the researchers, are in need of such guidance. Fifth, scientific chimeras might inform researchers and promote the art of medicine, as was the case with Chiron. Sixth, scientific chimeras might become protectors and guardians of human flourishing and life. Seventh, the invention of scientific chimeras might lead to *hybris* and the researcher’s tragic fall if blinded by hyped forms of cognitive optimism.

This raises finally the question on how one should address the phobia of possible scientific drifts. Mary Shelley compares Victor Frankenstein to an artist megalomaniac incarnating obstination who endangers the natural order and humanity’s future, a narrative that we find in most ecological discourses today and which causes irrational mistrust in science, nourished by images that invest the visual culture of today and denounces nano-monsters modifying the human body from the inside. The Catalan artist J. Fontcuberta elaborates images of chimeras that are blurring the limit between the natural and the artificial. A. Quercia explores the theme of the new scientific hybrids of enhanced humans through “alter ego’s” that are one’s double

Some artists use their own body as an experimental space questioning the limit between the enhanced body and the monstrous body, the feminine and the masculine as ontological categories. The possibility to modify one’s own body aims at the sublime through the strange and the incoherent. The transcendence of biological limits takes a religious tone in science that turns certainties into uncertainties. The confusion between the technological and the virtual reconfigures the relations between human, machines and animals, the real and the simulacra, the intimate and the visible, risking to dilute what was conceived as the specificity of humankind beyond its transformations. As the phenomenologist R. Ingarden used to say, the limit of interpretation of a text, be it the book of life, is to recognize the original in the interpretation.

Since the 1980’s, philosophers, sociologists, anthropologists, critics, and artists declare that we have entered a new era, of a post human condition. Indeed, human tissues can integrate non-human attributes

³³Schaub, 2006, pp. 29- 32.





and human bodies are made of a material that is transformable through genome editing, not only in poetic myths but also in reality. Some transhumanists argue that it is time to change the conception of humanity, and transgress all dichotomies between the masculine and the feminine. Any form of duality in a context of complexity seems to be a reductionist model. The aim of reinterpreting metaphors, is to go beyond dualism, in order to reach an emancipatory dimension from biological determinisms towards artefacts and synthetic biology. For others, sharing a fixist view, it is a transgressive path that could lead to monstrous hubris. Feminist writings, since D. Haraway³⁴, herself a biologist and a philosopher, have a lot to tell us about the overcoming of the dichotomy between techno philia and technophobia, opting for a more ironic gaze on man's dreams of auto-reproduction. What could happen when we become aliens to ourselves, as beings born not from a woman but from an artificial uterus for instance? In the 1950's, biological bodies became "technological communication systems", but were not quite fully reconstituted as sites of "differences" (male/female, natural/artificial, etc.) and resisted the idea of a subversion of a naturalistic status of the body. This subversion cannot be separated, in our century, from constructions of gender, race, and class, questioning the rational self of universal human species and the prophylaxis against a body as a stable map of normalized functions. Bodies are becoming cyborgs: "*The cyborg is text, machine, body and metaphor*".³⁵

This transformed body appears as a utopian body, liberated from the contingencies of illness and death. It is a product of the "will to power" to overcome human biological vulnerabilities, and is confusing the mantras of liberal economy and new forms of eugenics with human enhancement, pretending to go beyond biological determinisms of life and death. It is thus not a universally shared representation, because scientific reasoning describes facts that do not translate into immediate values. It is not sufficient for a general public to share concepts without shared meaning, in order to reach a consensus in a context of a plurality of cultures. Cultural representations and affects often resist the fast changes brought by science in the making, since the consequences remain merely predictions Artists create new monsters as mirrors of social desires, reminding us that in Latin '*monster*' comes from *monere*, which means "warning".

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³⁴ D. Haraway, *Modest-Witness@Second-Millennium. Femaleman-Meets-Oncomouse: Feminism and Technoscience*, Routledge, 1997.

³⁵ D. Haraway, *Symians, Cyborgs, and Women. The Reinvention of Nature*, FAB, London, 1991.





Appendix 1. The gender dimension of the monstrous and its impact on reproductive myths from Ancient Greece to post modernity

The reader of the real always encounters a fictional work based on metaphors that will cause a metamorphosis of its meaning. The identity of the subject is more and more associated with its genomics, which is not neutral in terms of self-representation, and it has normative implications. The question beyond “how did we arrive here” supposes to ask “where do we go from here”, if we take seriously the successive metaphors of the monstrous and hybridization through human modern history. We are able now to go beyond a desired narrative of eternity and pretend to realize it in the concrete reality of laboratories. Do we want to keep the narrative of genome edition as universal? Should we do so, on ethical grounds? Humans are metamorphosing themselves into chimeras. In what sense? And why should it be an issue, if all living beings undergo perpetual metamorphosis?

From art to Science

The question of the transgression among species resists normative differences among humans. It is indeed by analogy with ancient Greek myths that the word *chimera* reappeared in scientific discourse. The term was used mostly by development biologists in the 1990s to name a new object issued both from the theory of information embryology and what was called genetic programming in the 1950s. A chimera is an organism or a tissue having cells issued from two or several individuals from the same species or from different species. The technique of transgenesis and embryonic stem cells did modify the concept of chimera, which appeared at different scales in molecular genetics, from proteins to individuals. This genetic engineering acted at a microscopic or nano-level. Chimerism is, in this context, the result of the association of cells coming from tissues or embryos with different genomes. But the final result is the creation of a living being that is new from a genetic viewpoint.

Some usage of transgenesis has been criticized by scientists when an artist produced a GMO bunny whose genome had been transformed to incorporate a medusa gene rendering the bunny fluorescent. In 2005, a Chinese artist at the Venice Biennale, Xiao Yu, exposed a figure named *Ruan* composed of five recipients with pigeon cadavers while the sixth recipient contained the body of a bird in formaldehyde, wings wide open and with the head of a human fetus whose eyes were replaced by those of a bunny, to illustrate the monstrosity of science. *Ruan* represents a chimera assembled with a human fetus, a work of art that provoked a lot of controversies in Bern, while the piece aimed at denouncing the commodification of human bodies and genetic manipulations as monstrous. It questions the mixing of species as a form of violence, but questions also the separation between sexuality and reproduction.

The frontiers between species are still what conditions our shared humanity, for most people, and is presented as an illusion. If Greek mythology assumes this quest of separate identities and illustrates most of the taboos of our societies by asking for the sacrifice of monsters, as those who precisely cross the frontiers of norms, the myths of traditional societies insist on the sexual origin of the hybrids and divinize them, as a condition of the perpetuation of the human species. Hybrid sexual relations give birth to hybrid





children, a mix of animal and human, or humans with both sexes (the animal part being feminine, since Eve's transgression in the Bible). The scientific chimera cannot be the result of a sexual relation since hybridity can be performed in a Petri dish. The sexual is foreclosed from scientific discourse. So, if hybrids are the result of a sexual union in Greek myth, it is sterile when it is performed with a woman, considered to be a mere animal, as we find in A. Paré's book on *Monsters and Prodigies*³⁶ (1575) underlining the proximity between females and bestiality. This is illustrated for example by J. de Ribera in his painting *Magdalena her husband and her son*, where she appears as a bearded man with a breast feeding her baby (1631, museum of Toledo). For Montaigne in his essays, the hybrid is a monster because it is a quasi-human. The representations of human hermaphrodites³⁷ launches the search for oddities of nature. The most famous remains the "Elephant Man", Joseph Carey Merrick (5 August 1862 – 11 April 1890). The romantic expresses the sublime of terror with W. Blake's *Great Red Dragon* in 1805, facing a woman in labor and waiting to devour her new born child.



In the nineteenth century, we see many female monsters, representing vice and malediction, like Fernand Khnopff's *Des caresses, ou la Sphinge*" (1896, Musées Royaux des Beaux-Arts de Belgique) or in Gustave Moreau's *Oedipus and the sphynx*" (1864, NY Metropolitan Museum of Arts).

³⁶ Ambroise Paré, *Des montres et prodiges*, édition critique commentée par Jean Ceard, Droz, Genève, 1971.

³⁷published in 1775 by the French naturalist couple Nicolas-François Regnault and Geneviève Regnault in their book called *Les écarts de la nature*".





But for us the most intriguing works of arts are the *anthropoids*, either microscopic beings or embryos, with a predilection for floating hybrids inspired from known pathologies by Alfred Kubin in “*Le monde en éclosion*” (Museum of Munich).



Then came, logically, the birth of the cinematographic representation of monsters, in the film *Freaks* (1932, Todd Browning), which exhibits the profound humanity of monsters, questioning the restraining norms of nature. The freaks will soon be replaced by extraterrestrials monsters, inspired by Greek myths again, evoking a hybridity between man and plants that dismisses sexuality once more. The Martians become beings without sexual or digestive organs, pure brains, coming to conquer Gaia. In the 1980's, the protagonist Alien is in constant metamorphosis and becomes one of the most terrifying monsters imagined by the film industry. Then in “*The thing*”, we have a representation of “the thing”, which can embody any living being that it penetrates, emphasizing the affective mistrust towards science. Mary Shelley illustrated the idea that monsters could come from the hubris of science wanting to create life and risking to produce an indeterminate being, an illegitimate ontological status, as illustrated by Kafka's





“*Metamorphosis*”. This theme was played out in several movies, like “*The Thing*” (John Carpenter, 1982), or David Cronenberg’s “*The Fly*” (1986), or in his latest film “*Crimes of the Future*” (2022), in which the human species adapts to a synthetic environment and human bodies suffer mutations leading to the transformations and the surgery of human organs, becoming a new form of sterile eroticism. In the 20th and 21st century, artists have a critical gaze on the manipulations of the living and try to alert that the genetic modification that aims at the sublime may engender the monstrous. What is interesting is that in Greek mythology already, hybrids and chimeras do not have descendants, except for the Centaurs or the Medusa that return to animality through sexual intercourse. The idea is that the nature of hybridization between species can only be transitory, the fruit of a metamorphosis. In myths, all transgressions have catastrophic consequences, leading to sterility and the disappearance of humanity by the loss of the reproductive capacity.

So, the thematic of the other and monstrosity of the feminine continues from Greece to today’s biotechnologies of reproduction and makes of the hybrid a metonymy of the other, reducing humanity or the individual to a substitutable function or a replaceable being. The blurring of frontiers between organs and organoids as metaphors is scientifically possible and intellectually imaginable, in the name of the old myth of immortality. It has become a process of metabolization or metamorphosis, a continuous strategy of avoiding the determinism of death. by human agency.

What is beyond myth is precisely the idea that science should negotiate with the public an evolving limit to the process of change and define the ontology of what can be metamorphosed into something that would be neither human nor animal. These mutations imply a change of destination of the human person that cannot be defined by science alone, since it pertains to a theory of meaning of reproduction and gender roles, eliminating the narrative of a constitutive patriarchy on which most cultures are still based. It makes it difficult to imagine a concept of hybrid existence without constructing an alternative narrative that could be shared beyond the dialectic of the sublime and the monstrous, human and non-human in a global world where survival is at stake, in a western civilization, where “Science is the dominant culture”.





APPENDIX 2. Categories and types of sources consulted to identify relevant mythological and artistic representations of chimeras and hybrids

The project coordinator of HYBRIDA received extensive help from a group of specialized librarians at the University of Oslo to identify which kind of sources to consult.³⁸ Eight different categories or types of sources were suggested for the search:

1. Articles about chimeras and hybrids in different encyclopedias
2. Etymological studies on chimeras and hybrids
3. Primary sources
4. Religious studies
5. Ancient mythology
6. Art history
7. Science fiction and homunculus motives, and
8. Databases and journals
9. Art

The results of this search in terms of possible publications to consult is reported below:

1. Articles about chimeras and hybrids in different encyclopedias

- Wolfgang Speyer: "Mischwesen". In: *Reallexikon für Antike und Christentum*. Band 24, Hiersemann, Stuttgart 2012, ISBN 978-3-7772-1222-7, Sp. 864–925.
- Wiggermann, F. A. M.: "Mischwesen. A" In: Ebeling, Meissner, Weidner, Soden, Edzard, Meissner, Bruno, Weidner, E, Soden, W. Von, and Edzard, Dietz Otto. *Reallexikon Der Assyriologie Und Vorderasiatischen Archäologie: 8: Meek-Mythologie*. Vol. 8. Berlin: Walter De Gruyter, 1993, s. 222-244.
- Green, A. : "Mischwesen. B" In: Ebeling, Meissner, Weidner, Soden, Edzard, Meissner, Bruno, Weidner, E, Soden, W. Von, and Edzard, Dietz Otto. *Reallexikon Der Assyriologie Und Vorderasiatischen Archäologie: 8: Meek-Mythologie*. Vol. 8. Berlin: Walter De Gruyter, 1993, s. 245-264.
- Green, A., Volker Pingel and Lutz Käppel: "Mischwesen", in: *Der Neue Pauly*, Herausgegeben von: Hubert Cancik, Helmuth Schneider, Manfred Landfester.
- Graf, Fritz: "Chimaira", in: *Der Neue Pauly*, Herausgegeben von: Hubert Cancik, Helmuth Schneider, Manfred Landfester.
- Griffiths, A. "Chimaera". In: *The Oxford Classical Dictionary*: Oxford University Press.

2. Etymological studies on chimeras and hybrids

Chimera:

³⁸ H. Keyser Pedersen h.k.pedersen@ub.uio.no, A. Sæbø anne.sabo@ub.uio.no, R. C. Neverdal r.c.neverdal@ub.uio.no; O. J. Løland o.j.loland@teologi.uio.no; and F. Aurora federico.aurora@ub.uio.no.





- "χίμαιρα" in: Etymological Dictionary of Greek, edited by: Robert S. p.Beekes (Ph. D. 1969). Consulted online on 26/04/2021 <<https://dictionaries-brillonline-com.ezproxy.uio.no/search#dictionary=greek&id=gr7290>> First published online: October 2010.
- Frisk, H. (1970). Griechisches etymologisches Wörterbuch : 2 : Κρ-Ω (Vol. 2, p.1154). Carl Winter, Universitätsverlag.
- Chantraine Chantraine, p.(2009). Dictionnaire étymologique de la langue grecque : histoire des mots (Nouv. éd., Vol. 20, p.XIV 1436). Klincksieck.

Hybrid:

- Walde, A., & Hofmann, J. B. (1938). Lateinisches etymologisches Wörterbuch : I : A-L: Vol. I (3. neubearb. Aufl. J. B. Hofman., pp. XXXIV, 872).
- Winter: <https://archive.org/details/walde/page/n697/mode/2up>.
- Ernout, A., & Meillet, A. (1959). Dictionnaire étymologique de la langue latine : histoire des mots (4. éd., revue, corr. et augmentée d'un index., pp. XVIII, 820). Klincksieck).
- Concept history of hybrid: <https://begriffsgeschichte.de/doku.php/begriffe/hybrid>.

3. Primary sources:

Chimera:

- Text passages in Thesaurus Linguae Graecae (Χίμαιρα/χίμαιρα) (<http://stephanus.tlg.uci.edu.ezproxy.uio.no/index.php>)
I vedleggsmappen "TLG" er resultatene ordnet kronologisk med skille mellom eigennavn og vanlig substantiv
- Text passages in Thesaurus Linguae Latinae:
https://tll-degruyter-com.ezproxy.uio.no/article/O_2_3_Chimaera_v2007?currentIndex=1&&pop=1

Hybrida:

- Text passages in Thesaurus Linguae Latinae:
https://tll-degruyter-com.ezproxy.uio.no/article/6_3_17_hybrida_v2007?prevPackageName=6_3_14_hibrida_v2007&prevPackageType=Article¤tIndex=2&&pop=4).

4. Religious studies

Books

- Science, Fables and Chimeras: Cultural Encounters. 2015.
<https://www.cambridgescholars.com/product/978-1-4438-4810-7>.
- Chimera's children: ethical, philosophical and religious perspectives on human-nonhuman experimentation. 2012.
<https://www.bloomsbury.com/uk/chimeras-children-9781441198860/>.
- Wakeman, Mary K. *God's Battle with the Monster: A Study in Biblical Imagery*. Leiden: Brill, 1973.
- Van Bekkum et al, *Playing With Leviathan: Interpretation and Reception of Monsters From the Biblical World*. Leiden: Brill, 2017.
<https://brill.com/view/title/34277>.





Articles/book chapters

- Rachel Rafael Neis, "All That Is in the Settlement: 'Humans, Likeness, and Species in the Rabbinic Bestiary'" *Journal of Jewish Ethics*, 5 no 1 2019, p 1-39.
- Radler, Charlotte C. "The Chimera in the Garden: Mystical Discourse, Paradox, and the Coincidence of Opposites in Meister Eckhart and Michel De Certeau." *Spiritus* 12, no. 2 (2012): 180-89.
- Gangle, Rocco "Theology of the Chimera" in: *After the Postsecular and the Postmodern: New Essays in Continental Philosophy of Religion*. Edited by Anthony Paul Smith and Daniel Whistler. Cambridge, Cambridge Scholars Press, 2010.
- Deborah A. Thomas. "Assyrian Monsters and Domestic Chimeras." *Studies in English Literature, 1500-1900* 48, no. 4 (2008): 897-909.
- McNamee, Shane Patrick. "Human-Animal Hybrids and Chimeras: What's in a Name?" *JHR (Rijeka)* 6, no. 1 (2015): 46.
- Loudon, Bruce. "Hesiod's Theogony and the Book of Revelation 4, 12, and 19-20" i *The Bible and Hellenism: Greek Influence on Jewish and Early Christian Literature*. edited by Thomas L. Thompson, Philippe Wajdenbaum. Routledge, 2014.
<https://www.routledge.com/The-Bible-and-Hellenism-Greek-Influence-on-Jewish-and-Early-Christian-Literature/Thompson-Wajdenbaum/p/book/9780367871789>.
- Higgins, Ryan S. "The Good, the God, and the Ugly: The Role of the Beloved Monster in the Ancient Near East and the Hebrew Bible." *Interpretation (Richmond)* 74, no. 2 (2020): 132-45.
- Paffenroth, Kim. "On the Impossibility and Inevitability of Monsters in Biblical Thought." *Interpretation (Richmond)* 74, no. 2 (2020): 120-31.
- Pippin, Tina. "Mapping the End: On Monsters and Maps in the Book of Revelation." *Interpretation (Richmond)* 74, no. 2 (2020): 183-96.

5. Ancient mythology

- Bazopoulou-Kyrkanidou, Euterpe. (2001). Chimeric creatures in Greek mythology and reflections in science. *American Journal of Medical Genetics*, 100(1), 66–80.
[https://doi.org/10.1002/1096-8628\(20010415\)100:1%3C66::AID-AJMG1165%3E3.0.CO;2-U](https://doi.org/10.1002/1096-8628(20010415)100:1%3C66::AID-AJMG1165%3E3.0.CO;2-U).

U.

- Tralau, J. (2016). The Justice of the Chimaira : Goat, Snake, Lion, and Almost the Entire Oresteia in a Little Monstrous Image. *Arion*, 24(2), 41–67. Retrieved from <http://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-310393>.

Articles in *L'Année philologique*: <http://cpps.brepolis.net.ezproxy.uio.no/aph/introduction.cfm>

- Buongiorno, Pierangelo (2006). Gaio Antonio (cos. 63) e l'appellativo « Hybrida ». *Rudiae*, 18, 295-309.
- Cairon, Élodie (2007). Eustathe et la Chimère: (Iliade, XVI, 328-329). *Connaissance hellénique*, (111), 44-47.
- Foulon, Éric (2008). La représentation de Chimère dans l'« Iliade », la « Théogonie » et les arts figurés. In Galtier, Fabrice & Perrin, Yves (Eds.), «Ars pictoris, ars scriptoris»: peinture,





littérature, histoire: mélanges offerts à Jean-Michel Croisille (pp. 45-60). Clermont-Ferrand: Pr. Universitaires Blaise-Pascal.

- Raeck, Wulf (1992). *Modernisierte Mythen: zum Umgang der Spätantike mit klassischen Bildthemen*. Stuttgart: Steiner.
- Tritsch, F. J. (1951). The myth of the Chimaira. In *Actes du premier Congrès de la Fédération internationale des Associations d'études classiques* (pp. 279-280). Paris: Klincksieck.

6. Art history

Artistic representations of chimeras in antiquity:

- "Chimaera" in: *Lexicon iconographicum mythologiae classicae (LIMC)* : 3: 2 : Atherion-Eros Vol. 3: 2, p.826ff). (1986). Artemis Verlag.
- LIMC online supplement: <https://weblimc.org/>.

Chimeras in popular culture:

- Gloyn L. *Tracking classical monsters in popular culture*. Bloomsbury Academic, London: 2020. Du får automatisk beskjed når boken er tilgjengelig i Oria, det tar vanligvis under en uke. Siden dette er en ebok kan dere lett søke dere frem til de avsnittene som nevner chimeraer.
- *The Ashgate encyclopedia of literary and cinematic monsters*.
- https://en.wikipedia.org/wiki/Chimera_in_popular_culture.

Relevant articles on chimeras in art:

- Powell, D. (2004). Chimera Contemporary: The Enduring Art of the Composite Beast. *Leonardo* 37(4), 332-340. <https://www.muse.jhu.edu/article/171768>. Abstract: "Outlines the history of organic manipulation within the scientific and artistic communities. The author asserts the fascination man has had with the animal form, explores the etymology of the word chimera, and charts the history of the representation of mutant animals from ancient to classical times."
- McNamee, Shane Patrick. Human-Animal Hybrids and Chimeras: What's in a Name? *JAH*R (Rijeka), 2015-07-01, Vol. 6 (1), p.46. Abstract: "This paper seeks to analyse public opinion and understanding of human-animal hybrid and chimera research; an area in which there are particularly strong opinions and reactions, but perhaps relatively little understanding or effective communication with the public. The paper will begin with a look at the mythological, historical and science-fiction connotations of these sorts of terms, and where the negative public opinions may have originated. The extent of this sort of research, and what precisely is covered by the various terms (such as xenotransplantation, transgenics, hybrids, and chimeras), will be examined."
- Brem, Sarah K; Anijar, Karen Z. The Bioethics of Fiction: The Chimera in Film and Print. *American journal of bioethics*, 2003-08-01, Vol. 3 (3), p.22-24 Permalenke: https://bibsys-almaprimo.hosted.exlibrisgroup.com/permalink/f/14fha3m/TN_cdi_proquest_miscellaneous_71338797.
- Clayton, Jay. Victorian Chimeras, or, What Literature Can Contribute to Genetics Policy Today. *New literary history*, 2007-07-01, Vol. 38 (3), p.569-591. Permalenke: https://bibsys-almaprimo.hosted.exlibrisgroup.com/permalink/f/14fha3m/TN_cdi_proquest_journals_221369193.





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- Blom, I. (2021, 04). SOUND EFFECTS: INA BLOM ON THE ART OF FLORIAN HECKER. *Artforum International*, 59 Retrieved from <https://search-proquest-com.ezproxy.uio.no/magazines/sound-effects/docview/2511926755/se-2?accountid=14699>.
- Miller, S. (2003). Paciurea's Chimeras. *Apollo: The International Magazine of the Arts*, 158(500), 26. Abstract: "Discusses the chimera sculptures of the Romanian sculptor Dimitrie Paciurea (1873-1932). The author notes the influence of the writer Gustave Flaubert's conception of the chimera on the Symbolist group of artists including the Salon de la Rose + Croix led by Sâr Joséphin Péladan".
- Manipulating genetic identities: The creation of chimeras, cyborgs and (cyber-) golems. Daubner, E. (2002). *Parachute (Canada)*, (105), 84.
- Glaas, C. (2009). Les artistes après darwin. science, chimères & fantaisies. [artists after darwin. science, chimeras & fantasies.]. *Beaux Arts Magazine*, (296), 100-105.
- Tourangeau, J., Audet, G., Baxter, B., Bernard, D., Cox, A., Daudelin, E.,... Thibault, M. B. (1999). *Chimere: Mythes et legendes, contes et chroniques, fetiches et talismans [chimera: Myths and legends, tales and chronicals, fetishes and talismans]* Published by Gallery

Examples of artistic representations of chimeras (using the search words "Chimera OR Chimaera" in the data base ArtStor):

- https://bibsyst-almaprimo.hosted.exlibrisgroup.com/permalink/f/vo8oc9/BIBSYS_ILS71510559280002201.
- Gustave Moreau (French, 1826 - 1898) Title: The Chimera. Work Type: Painting. Date: 1867. Material: Oil on panel: https://library-artstor-org.ezproxy.uio.no/#/asset/AWSS35953_35953_29352785.
- Louis Jean Desprez (French, Auxerre 1743-1804 Stockholm). Title: The Chimera (La Chimère de Monsieur Desprez). Work Type: Print. Date: ca. 1777-84. Material: etc.hing: https://library-artstor-org.ezproxy.uio.no/#/asset/ARTSTOR_103_41822000169589.
- Chimera Front 3/4 View. Date: 380-360 B. C. Material: bronze. Measurements: 1. 285x. 65m. Subject: Chimera (Greek mythology). Sculpture--Etrusco/Italic (Etruria): https://library-artstor-org.ezproxy.uio.no/#/asset/SS7731421_7731421_11075103.

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8. Databases and journals

- [ATLA Religion Database with ATLASerials](#)
- L'Année philologique: <http://cpps.brepolis.net.ezproxy.uio.no/aph/introduction.cfm>
- [Zygon. Journal of Religion and Science](#)

9. Art:

- [International Bibliography of Art - \(Info\)](#)
- [Bibliography of History of Art \(BHA\) - \(Info\)](#)
- [ARTstor \(Info\)](#)

