Holotipus special issue

2020

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PUBLISHER

Holotipus
is an open access, peer -reviewed scientific journal devoted to Zoology, Systematics and Taxonomy. Special issues are dedicated to editorials and scientific papers focused on Art and Biology.

Submitting papers should be addressed to Publisher, Chief Editor or Managing Editor.
holotipus@holotipus.it

Designed, published and printed in Italy by Holotipus publisher & ActionKlavier studio, Corso Peschiera 315/A, 10141 Torino

Holotipus rivista di zoologia sistematica e tassonomia ISSN 2704-7547

Printed version in 25 numbered copies is deposited at BNCN in Firenze, IT
ISBN 979-12-80005-01-4

DOI 10.5281/zenodo.4362201
urn:lsid:zoobank.org:pub:
E73BDDC6-69AC-4E76-8B11-71F544E3DF5A

Pictures by Vincent Fournier from *Post Natural History* · 2012-ongoing
Front cover image

[Manouria praecognito]

BLACK CELESTIAL TORTOISE

Divine Tortoise

Animal used to observe and divine the future through constellations. Dynamic display of the Milky Way on the shell.

UNIFICATION OF KNOWLEDGE

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Introduction by Matteo Grasso
Text by Joe Davis

Pictures by Vincent Fournier

59. *[Oryctes transmissionis]*

RHINO BEETLE

Insect adapted for continuous tracking

GPS receiver in the horn acts as an integrated antenna.
Secretion of a two-layer ABS/Plexiglas material.
Accurate time signals. Head and thorax made with aluminum for short-wavelength transmissions in the ISM band from 2,400–2,480 MHz. Able to withstand accelerations of 12,000 g or about 118 km/s2.
Additional L5 frequency band at 1.17645 GHz.

62. *[Zerdas hypnoticus]*

WHITE FENEC

Ability to enter and control the mind.

Provides unparalleled access
(haemodynamic response)
to detailed patterns of activity in the human brain.
Data storage.

For this special issue we thank

Pedro Medina Reinón,
IED Madrid & Artecontexto

Chiara Lunazzi,
Università degli studi di Torino, Italy.

Introduction by
Matteo Grasso. Received on
21 April 2020 / Accepted on
1 June 2020 / Published on
24 December 2020

UNIFICATION OF KNOWLEDGE

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INTRODUCTION

BioArt is a broad term used to introduce many artworks. In order to simplify, two main points of focus could be examined: one is devoted to increasing and ordering our knowledge about life, whilst the second one involves the ethical implications derived from the "living" tissue on which BioArtists work.

Last but not least, the "device" matter. This helps to accentuate the emphasis on the display, intended as dialogic process. This is easily done: interaction between biology and human being. However these two share more than one goal. In fact, they are responding to connections drawn from the human history. These connections are often marked by amazing events in technological or social fields, thus resuming a linear time scan.

Joe Davis is an affiliate researcher in the biology department at MIT and Harvard Medical School – George Church Laboratory, Massachussets, U.S.A. His artworks, carried out with a science-based approach, investigate philosophical issues working on topics which can be considered very "small" -such as texts and graphic in DNA- compared to others -such as astrobiology-. Davis' efforts have often been quoted in the scientific literature. In fact, he is currently cooperating with Holotipus as a senior editor.

Vincent Fournier is a French art photographer. Relating space, utopian architecture and live technology he is inspired by visions and scientific utopias in order to make them resound in the collective imaginery. Issues and tensions are suspended between reality fiction and science. In doing so, Fournier stresses the visible – invisible boundary in his artworks, uncoupling what is natural from what is not. His works can be easily seen at Metropolitan Museum of Modern Art (New York), at Centre Pompidou in Paris and at other important museums.

The extensive experience of Davis stresses a renaissance interdisciplinarity which needed to be recovered. Fournier's work warns us not to neglect the importance of an in depth analysis that appears to us as a stream of consciousness, just like the expressionist writing style.

As Hauser wrote (2005), the taxonomic origin of the term BioArt is not simply a hybrid or a teratological, cultural organism. Nevertheless the focus is still on the time. The latter continues to assert itself in a punctual and homogeneous continuum. Starting to get through historical materialism, BioArt has moved away from the Greek supremacy of the witness gaze.

Industrial and technological revolutions, social events and punctuated linearity of time were reinforced by the value-based on Natural Science, as an ideal (Agamben, 2001), distancing us from a genuine reunification. Instead art and science share the observation time, such as the occurrence of an event. We can and must restate the unity, not just endure it as an ideal. Rethinking a new perception of time. Davis' reference to "doing" as well as Fournier' "showing" is not left to chance. It is in acting that we escape time and we approach History, pleasure and joy in discovery which combine art and science.

As the publisher of Holotipus, I am delighted to introduce Davis and Fournier to an ever wider audience, such as zoologists and taxonomists. I am absolutely convinced that art aims to innovation to zoology, therefore a pivotal and contemporary goal.

Marcus Vitruvius Pollio, namesake of Leonardo da Vinci's Vitruvian Man, was a Roman polymath who lived during Caesar Augustus' reign. His great work, De Architectura, got lost but resurfaced during the Italian Renaissance. The first illustrated version was republished in 1511. In the first chapter, Vitruvius wrote that the knowledge that artists and architects possess should be rooted in both practice and theory. The Vitruvian motto, "Mens et Manus" appears on the MIT seal, likewise suggesting that craft must be accompanied by rigorous scholarship.

During the first century BCE, Vitruvius pointed out that artists must both be creative and have the ability to listen and learn new things. Indeed, an artist deficient in either of these qualities could never become a master of their practice. Vitruvius went on to outline a list of things he thought an artist should know:

"He should be a good writer, a skillful draftsman, versed in geometry and optics, expert at figures, acquainted with history, informed on the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences both of law and physic, nor of the motions, laws, and relations to each other, of the heavenly bodies… Since, therefore, this art is founded upon and adorned with so many different sciences, I am of opinion that those who have not, from their early youth, gradually climbed up to the summit, cannot, without presumption, call themselves masters of it."

(Marcus Vitruvius Pollio: de Architectura, Book I, Chapter 1)

Vitruvius advised that artists should know something about the science of medicine and the motions and proportions of the human body. A conviction that inspired da Vinci more than 1500 years later.

While he remains largely unknown to modern readers, Vitruvius is known to have influenced the multi-talented Renaissance figures presented to us as schoolchildren. We were told that these people were the flowers of the human intellect and led to believe that this is what we may all become. However over time, secular structures embedded in higher education and business would ultimately sweep away this Renaissance ideal. The dream of Renaissance would ultimately be replaced by the belief that the arts and sciences have become far too specialized and complicated and that in our own era, no individual can make significant contributions to multiple fields.

Somehow, more than two thousand years ago, Vitruvius seems to have anticipated this reaction. He claimed that since everything is connected, all that is needed is natural curiosity and an ability to pay attention: "Perhaps, to the uninformed, it may appear unaccountable that a man should be able to retain in his memory such a variety of learning; but the close alliance with each other, of the different branches of science, will explain the difficulty. For as a body is composed of various concordant members, so does the whole circle of learning consist in one harmonious system. Wherefore those, who from an early age are initiated in the different branches of learning, have a facility in acquiring some knowledge of all, from their common connection with each other."

(ibid)

What is the common thread in this heterogeneous opus? Vitruvius seems to think that unity of knowledge is, in fact, intrinsic: everything already exists as a kind of synchronized whole, and it is only the way we link things together that newly transforms them into opportunity and innovation.

64-65. *[Marcus Vitruvius Pollio...]*

Joe Davis

...unity of knowledge is, in fact, intrinsic...

Vitruvius advised that artists should possess
a certain level of knowledge about
the science of medicine
and the motions
and proportions
of the human body.

With reference to an artist's wealth of knowledge, scientific information plays a key role. Specific knowledge of cosmos and heavenly bodies heavily characterizes Adam Elseimer's work (German artist at the turn of the 16th and 17th century, well known for his tiny, meticulous landscapes and mythological representations). In "The flight to Egypt"*, preserved in Moscow, there are stars, the moon and the milky way. Moreover, they are represented as they had been observed for the first time through the telescope conceived by Galileo Galilei**. Designed in Venice, the telescope is the outcome of his studies on optics. In addition to that, during the Baroque period there were lively contacts between scientists and artists, which extended far beyond Leonardo

Yet in our own time, artists can not understand physics or chemistry, law, philosophy, medicine, or astronomy. The deep connections between art and mathematics are all but forgotten and in many cases, even music and history have been removed from the list. While we continue to call upon artists to describe the whole world, whatever artists choose to remain clueless about simply cannot be described.

The conceiving and doing paintings and their aspect ratio are based on mathematics. In "Flagellation of Christ", painted by Piero della Francesca in 1444 or 1451: the golden section (Divine proportione or Constant of Fidia) postulated by Luca Pacioli, carries the base of painting in the proportional relationship AB:AC = AC:AB.

Until relatively recently, technological advancement seems to have come hand-in-hand with the grand fragmentation of knowledge into arbitrarily concise subjects and specialized categories. Scholars of the humanities now acknowledge that the separation of arts and sciences was an artificial one perpetuated by centuries of history that turned metaphysics into the foundation of all things artistic. The machinery of this historical artificiality and its categories can be traced back to the 18th century's Romanticism, an artifact of the "Counter-Enlightenment" that has now assumed a kind of de facto reality. Times have changed in ways that could not have been foreseen by Marcus Vitruvius Pollio. In the majority of cultural contexts, artistic thought and practice have been relegated to the fringes of society as frivolous, trivial or ornamental where art is most often thought of as a means to decorate rather than to innovate. However, these notions call for some pretense or disregard of history.

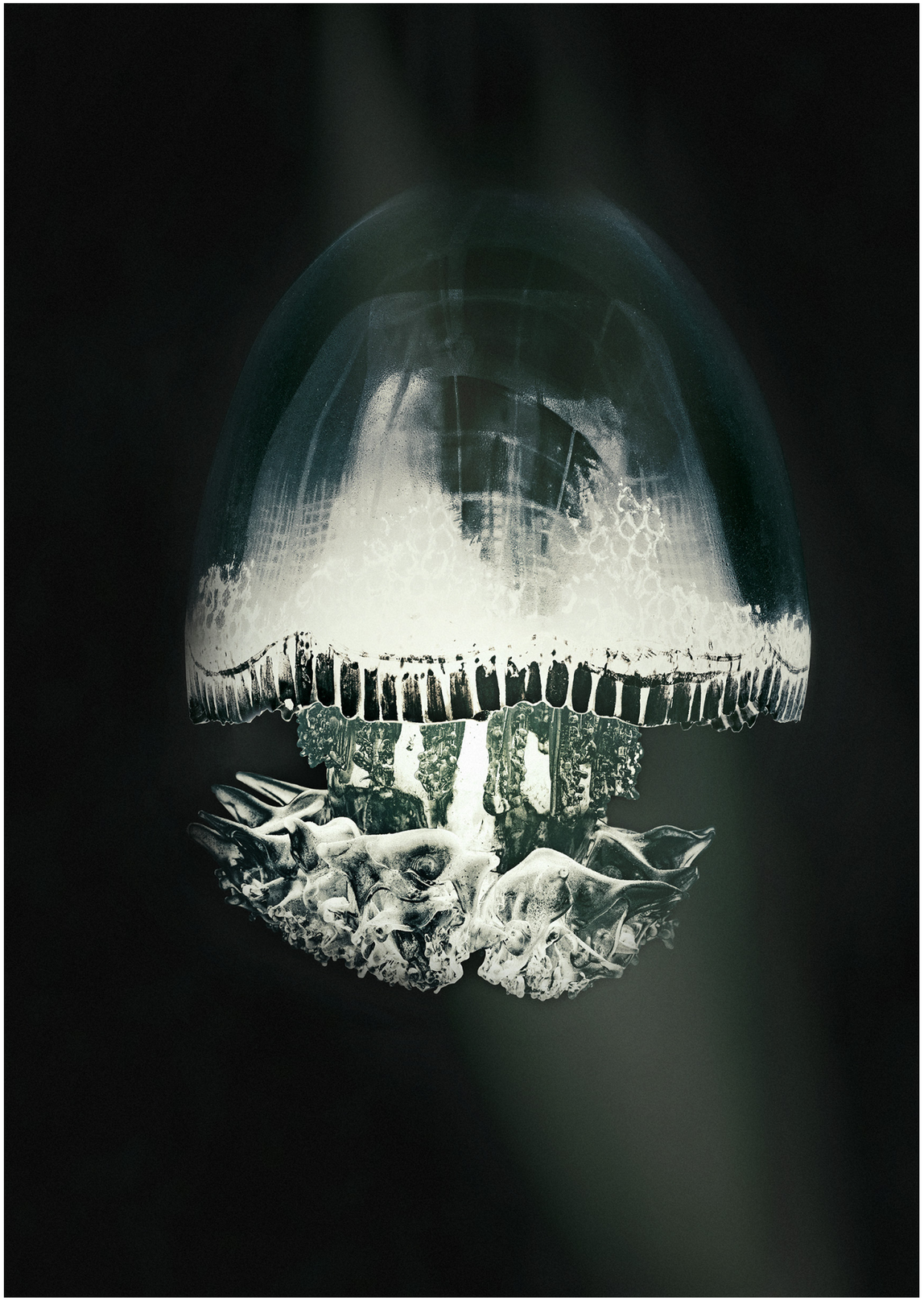
Art students in our own era generally have no idea that this is a constructed separation of art and science and that artists contributed to the invention of mathematics, astronomy, chemistry, physics and biology. The idea that great advances in art and science can be part of the same pursuit has become increasingly difficult to reconcile.

There is a surviving impression that artists have unique abilities to draw together ideas from all quarters in order to represent our collective dreams and aspirations. Art is still expected to summon the human spirit. We depend on artists to predict the future and to answer deep questions about the mysteries of life. Artists are still expected to interpret the world for us.

It is no secret that in the modern world, artists are mostly unemployed. Nevertheless, it would be a grave mistake to extrapolate from the privileged and insular art markets of say, London or New York to gauge potential impacts that the arts can have on society at large. Just as in many cases, the dry, empirical operations of scientific research might lead us to believe that they cannot become importantly poetic, or aesthetically relevant. The scientific search for extra-terrestrial intelligence, interpretation of dreams in Freudian psychoanalysis and mind-bending aspects of quantum physics might be counted as several contrary examples.

So, what kind of background do artists need now to make significant contributions to society? Artists still require broad knowledge.

Ideas about the grand synthesis of knowledge inspired the first universities and centers of learning in medieval Europe, medieval China and Japan. In addition to that, the Royal Societies and great academies of the European "Enlightenment" (the Age of Reason) were also founded thanks to these ideas. These same aspirations have resonated with every historic movement of mind, every intellectual elite, every perestroika of the exact sciences and liberal arts. In fact, the idea that artists have special abilities to reach out across domains may stand as evidence that some kind of unification among them already exists.



Artists don't have to entirely devote themselves to science and technology, but the mandate of Romanticism to disregard all rules but your own has become untenable as well.

Perhaps "Renaissance" is inevitable whenever civilization reaches a point where legacies of war and brutal religious intolerance have been overturned and people find time for scholarship and access to sufficient concentrations of knowledge. Perhaps pursuit of the great unification of knowledge has always been an intrinsic part of human nature.

Many prerequisite elements are already in place. Findings in physics and biology have exponentially expanded the landscape onto which humanity can project its activities. Breath taking profusions of knowledge are now bursting into existence with the potential to accelerate intellectual, social, scientific and technological development worldwide. We have the cognitive apparatus and we have the technological means.

So, what is missing?

66-67. *[Hemikyptha botuli]*

TREEHOPPER
Pollutant-sensitive insect

Bacterial sensor-reporter cells detect pollutants. DNA parts (by direct DNA synthesis) for constructing an inducible sensor-reporter circuit. Production of a fluorescent protein based on the bluelight receptor YtvA protein (from Botulus subtilis). VP64 activation domains. Nuclear localization signals of cells on ventral abdominal region.

68. *[Fantauma cerebrum]*

ETHEREAL JELLYFISH
Electronic entity able to
travel between dimensions.

Pure electricity delivers data to other dimensions. Quantum space messaging capacity.

The culture we reside in must have the capacity to sustain Renaissance. Just as in the Italian Quattrocento, social and institutional structures cannot cope with the consequences of such sweeping changes. In many cases, powerful religious communities and conservative political forces control or completely block universal access to education and to comprehensive education in many of the sciences.

In some of the most technologically advanced societies universal education is available only to individuals of low or moderate income. Even if they are admitted into the classroom or laboratory, it is unlikely they will be able to afford the large financial investment that attending a university will increasingly require.

Previous generations have left us with a deteriorating environment, destabilized international political situations, stumbling top-heavy economies, and dwindling public support for science, art, the humanities and many social services, including education.

As universities turn to sources of private support, many have converted their endowments to become fully diversified international super-corporations with operations and capital investments that reach far beyond traditional mandates to carry on scholarship and research. Businesses work toward profits and university administrators fail to reconcile those interests with the primary mission of creating new knowledge. Relationships of sponsored research with unrestricted enterprise and entrepreneurship are flawed at the expense of innovation and creativity. Advancement of knowledge is all too often subsidiary to technology licensing, profits, market strategies and military and political initiatives. The ways in which research enterprises are supported restrict the nature of scientific investigation, determine the nature of projects undertaken and the realm of possibilities that will be considered for future research. Problems that cannot be solved profitably are likely to be ignored. In Star Trek lingo, we have compromised our university systems with something like "Ferengi economics" and "Rules of Acquisition."

Tragically, no society has ever been more technologically advanced and yet the average person has never been more indifferent to technological developments and scientific principles that make "quality of life" possible. If the Romantic era saw the humanities moving away from the sciences, the Modern era erased hope for the reunion of science and art.

Despite this, signs of change are appearing. In the past decade, many scientific laboratories and whole fields of research have become increasingly interdisciplinary. International conferences and conclaves resonate with these changes and new university programs have been established to coordinate these developments. So far, such initiatives do not formally integrate art and science, but these disciplines too are quietly disengaging from their historic separation.

Keeping in mind that the artistic curriculum of Vitruvius can be dated to the first century BCE, it seems obvious that he might now feel the need to update his list of prerequisites for artists in the 21rst century.

Art can have little relevance or immediacy unless it is constantly rebuilt with increasingly sophisticated sets of actions, forms, and symbols. There are absolutely no reasons why artistic practice should not be just as precise and rigorous as the practice of physics, chemistry, philosophy or mathematics.

71. *[Passeridae temperatio]*

IBIS

Drought-and frost-resistant bird

Long talons made with silicon-28
with an improved cell wall strength of 1%
lethylvinylsiloxane units (R= CH3 —; R' = CH2 = CH—) 95-99% purity. Molecular weight, (3-8) x 105; density, 960-980 kg/m3 (0.96-0.98 g/cm3). Temperature resistance: from -30°C up to +700°C.

More than ever before, the future of innovation in both art and science depends on fluency in multiple fields and strong, multidisciplinary mindsets. Some artists may be too impatient to wait for art to fully recover its former scope and they may instead opt to explore a role that still remains unknown to us: neither as an artist nor as a scientist, but rather as an artist-scientist, both free enough to tackle absurd questions and disciplined enough to be scientifically rigorous about the way the work is carried out. There is a chance, where it is possible to both dream and act, that the centuries of opposition between art and science can finally be resolved.

Notes

* Galilei's discovery is well documented in his work: the "Sidereus nuncius" (Celestial messenger) published on March 13, 1610 in Venice, one year after the execution of Adam's painting.

** Optical information on Galilei's telescope is a topic that will also affect Caravaggio.

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ISSN 2704-7547
ISBN 979-12-80005-01-4