

# THE ART OF DECODING

*n*-folded, *n*-visioned, *n*-cultured

by

Mark Guglielmetti

Monash Art Design + Architecture (MADA)

Monash University

mark.guglielmetti@monash.edu

## DECODING: THE NATURAL ORDER

**Artificial life (A-Life) originates, so the accepted narrative goes, from the domain of science.** In this discursive orientation much is underwritten by cybernetics and information theory to generate (evolve) computationally *lifelike* behaviour and the emergence of life, irrespective of material form<sup>3</sup> and to locate “*life-as-we-know-it* within the larger picture of *life-as-it-could-be*.”<sup>4</sup> In this undertaking scientists simulate “biological life to evolve patterns, images, programs and more generally to formulate new strategies of control which are more adequate to the liquid space of informational capitalism.”<sup>5</sup> The complexity of life is measured not by the metaphorical and material relays through which humans are being redefined as posthuman<sup>6</sup> but by observing “abstract mathematical musings”<sup>7</sup> and complex mathematical patterns as they are *seen* to self-organise and emerge in images.

Notwithstanding this scientific account of artificial life, there are multiple dimensions to examine artificial life.<sup>8 9 10</sup> I explore artificial life itself as constituent of the moving image specifically as visualised in three-dimensional computer generated space (3D space). Of particular interest in this examination is the view or

## A B S T R A C T

*Scientific modelling requires us to suspend disbelief, nowhere is this more palpable than in artificial life, an area of computational research investigating the principles that constitute a living system “without making reference to the materials that constitute it.”*<sup>1</sup>

*This paper investigates artificial life visualisation as both a scientific concern and in relation to media arts. Of interest in this examination is the normative protocol of looking at an artificial life simulation or ‘world.’ Analogous to looking through a telescope or microscope, the view into the artificial life world is monocular and often fixed; in this regime we look at ‘organisms.’ This strategy of looking through the scientific lens to observe a ‘natural world’ enfolds other forms of cultural tactics that require decoding including but not exclusive to Bazin’s ontology of the photographic image, Disney nature films and other “apparatus-based universes which robotize the human being and society.”*<sup>2</sup>

*Subsequent to identifying these protocols in artificial life visualisation I describe a number of works which exploit normative computational procedures to align artificial life image making into optical consistency with other forms of contemporary culture and to celebrate the ‘ocular madness’ found in art forms such as neo-baroque image making and Islamic art.*

‘window,’ from the virtual camera into the artificial life computational model, and how it organises a dense field of expectations. These expectations include how the camera that frames the image is deployed to create the appearance of an unmediated reality into abstracted mathematical models which, when rendered,

generate perceptible images of, what is commonly referred to as, the ‘world.’

Analogous to looking through a telescope or microscope, the view into the artificial life world is monocular and often fixed in the ‘world.’ The success of arti-

cial life visualisation is dependent on observing 'lifelike behaviour' <sup>11</sup> within the image and deciphering emergent patterns in, the 'world'; what is perceived in the 'world' or on the screen is what there is to perceive.

The coded generators of this lifelike behaviour are often referred to as "creatures," <sup>12</sup> "cyberbeasts," <sup>13</sup> and "virtual organisms." <sup>14</sup> These creatures, often 'live,' 'fight,' 'breed,' 'trade' and 'die' in the virtual world; that said, rarely do they 'work,' 'shop,' 'shit,' 'fuck' or afford a 'point of view'; sticky messy descriptions that rarely pervade the imaginative and iterative loop of pattern generation. The anthropomorphic machinations of an A-Life 'world' are described through the discursive framework and nomenclature of science and economics, more so than from a personal intimate perspective of life.

This institutionalised orientation is not exclusive to the nomenclature of artificial life as a journalistic enterprise for scientific journals, academic publications and as filter for the artist's press release, but extends to other taxonomies of A-Life such as the interpretive viewing regime of the A-Life world. The normative viewing protocol through which to view an A-Life 'world' is predominantly filtered through the fixed lens of the virtual camera view into the modelled world. In this regime we look 'at' the aforementioned creatures etcetera. This tactic of looking through the instrumentality of science, the arts of reality, is parallel to looking through André Bazin's <sup>15</sup> 'long take' in cinema and documentary filmmaking in which we look 'at' an unmediated view of reality; in other words in looking 'at' an image of artificial life we look 'through' a non-intrinsic regime of seeing.

In the case of the artificial life, observation vis-à-vis the long take stands in reserve as the de facto protocol which functions to record (shoot) an unmediated reality of the A-Life world, perhaps for good strategic

reason; when "we abandon the notion of a camera as an adversary to the world ... and instead place the accent on its 'natural' connection to the world, we reach another, more orthodox version of a camera. This approach stresses the necessary, scientific links among objects, light rays, and film emulsion [...] A camera comes the bearer of tokens from the world." <sup>16</sup> A natural order is established in service of scientific method, measurement, classification, documentation and re-presentation arbitrates fact from magic, facts are not man made. In the domain of science "it is not I [the experimenter] who says this; it is the machine." <sup>17</sup> Indeed, the epistemological (scientific) framework through which to legitimately measure the world vis-à-vis the camera (virtual or otherwise), originates through the complex matrix of French politics less than 15 years after Nicéphore Niépce's *View from the Window at Le Gras* (1826) was taken, when M. François Arago persuasively reasons to the government of the French July Monarchy, and confirming to the French public that, "the camera lies no more than does the thermometer, the microscope, and hygrometer, and so on." <sup>18</sup>

The window into artificial life worlds evokes nineteenth-century 'scientific' studies or early twentieth-century photoplays than is suggestive of either Friedberg's <sup>19</sup> "new space of mediated vision [which] is post-Cartesian, postperspectival, postcinematic, and posttelevisional" or the "celebration of ocular madness" <sup>20</sup> in other forms of neo-baroque image making. <sup>21</sup> <sup>22</sup>

The advanced expectation from practitioners of artificial life screen-based imaging is the virtual camera itself functions similar to an analogue device, such as the microscope or telescope, in that it impassively frames the 'world' whilst it simultaneously optimises the credibility or factuality of the 'world' and like an analogue camera it records a temporal image of the

'world'; in other words, the virtual camera functions like Vertov's "microscope and telescope of time." <sup>23</sup>

The camera (virtual or otherwise) does not record an unmediated reality or 'world'; all cameras (virtual or otherwise) are devices that create images. That all images "are mediations between the world and human beings" <sup>24</sup> is an important reminder that an image is not a window into a world – it is an image. <sup>25</sup> In this, all image making is rhetorical. Flusser's description of the photographic apparatus is a critical reminder that:

*[the] 'objectivity' of technical images is an illusion. For they are – like all images – not only symbolic but represent even more abstract complexes of symbols than traditional images. They are meta-codes of texts which . . . signify texts, not the world out there.* <sup>26</sup>

Flusser's <sup>27</sup> sombre view that the "photographic universe and all apparatus-based universes robotize the human being and society," is a timely cue that the view into an artificial life world, and indeed into the broader spectrum of scientific and data visualisation, is important.

The investigation into the interpretive regimes and the technical apparatus gives only a partial dimension to the relationship between artificial life and the moving image. Other important factors under consideration are the narratives that accompany artificial life works themselves. Scientists often publish in scientific journals fictive accounts of the artificial life system that simply don't accord with the target system, as illustrated in Watson and Lovelock's <sup>28</sup> scientific study of an "imaginary planet [with] a very simple biosphere" in the project *Daisyworld*. After warning the reader that they "are not trying to model the Earth, but rather a fictional world," Watson and Lovelock <sup>29</sup> go on to describe *Daisyworld*: "Owing to a subtle change of climate,

clouds appear on daisyworld [sic]. The clouds are light in colour. We will assume that the clouds form only over stands of black daisies because of the rising air generated over these warm spots." <sup>30</sup> To state the obvious, stylised descriptions have properties that the models don't <sup>31</sup> and as Michael Renov convincingly argues, all discursive forms are "at least *fictive*, this by virtue of their tropic character (their recourse to tropes or rhetorical figures)." <sup>32</sup>

The stories that migrate in artificial life are contemporary accounts of 'nature' whose genealogy can be traced to Disney filmmaking, specifically, the nature film (to simulate life as we know it vis-à-vis moral and political refractions) and Disney animation, which, as lead Disney animator Art Babbitt observed, "follows the laws of physics – unless it is funnier otherwise." <sup>33</sup> Artificial life 'world building' is formed in the shadow of Disney nature storytelling: cyberbeasts, virtual organisms and agents are organised, optimised and then observed, like the Disney animal kingdom, to trade, fight, breed and die. Moreover, similar to Disney stories that do "something far more than reveal 'nature's mysteries': they [speak] to us of a living and intelligible world beyond the fence of civilization, a world we [can] enter at will and experience in something like human time." <sup>34</sup> Artificial life is of its essence a dramaturgy of the fitness landscape. <sup>35</sup>

### ***n*-FOLDED, *n*-VISIONED, *n*-CULTURED**

A high degree of artifice is involved in scientific visualisation in general, more so in artificial life 'worlds.' Take for example the virtual camera that frames the view into the artificial life world. The term virtual camera itself is shorthand to describe an array of algorithmic functions, some of which are mapped to functions that have equivalence in digital cameras. The virtual camera is also host to a large range of algorithms

that simply do not have physical correspondence to the world such as the 'z-buffer.' The z-buffer is a data structure unique to 3D visualisation; it establishes and determines the logical drawing order of objects and elements in 3D space in relation to the virtual camera. As illustrated in Figures 1-3, objects closer to the camera occlude objects or elements far from the virtual camera, correctly reproducing perspectival depth perception. Though the z-buffer is programmed into 3D software to create a 'realistic map' of the world it is instructive to remind the reader that 'world' is a social concept <sup>36</sup> and mapmaking is rhetorical. The z-buffer is just another algorithm in a database of algorithms; it too can be re-imagined as a rhetorical device. For example in my project *Laboratories of Thought*, the z-buffer is rewired to my subjective experience of the gallery the Trocadero Artspace in Melbourne, Australia. The drawing logic of three-dimensional space is reordered according to criteria other than spatial. Unlinked from conventional spatial logic the z-buffer is reconfigured along subjective lines, in this case emotional valency; what I like most about the Artspace to what I like least.

The project explores the tensions inherent in employing the mathematical rationalisation of pictorial space as a model through which to filter my emotionally and biologically mediated experience of the physical environment. By encoding the virtual camera to reorder the visual field of the 3D scene to 'what I find interesting' (emotional valency) I unpin the grammar of the image from a spatial field to a grammar of potential; what I find interesting dynamically changes from moment to moment. Mapping the grammar of my emotional valency to the visual organisation of space is of course arbitrary; any data can be used to reorder the spatial field, in fact any data could be rewired to many other virtual artefacts not just the virtual camera.

And this is the point. At stake in artificial life image making is agency. Instead of looking at creatures etc, it is incumbent upon us to examine what it means to look *through* an interpretative agent's 'point of view.' Drawing on a media ecological framework Matt Fuller asks, "What arises when two or more standard processes, with their own regimes, codes, modes of use and deployment, systems of transduction, and so on, become conjoined?" <sup>37</sup> Fuller's question can be restated as, what arises when the conventions, processes and protocols from artificial life are conjoined with those from film, cinema and the moving image? The closest reference point that articulates what this interpretative agent might be is situated in the grammar of the moving image – the filmmaker. This merging of discursive practices frames an examination into an artificial life 'filmmaker', as it (the system) searches for interesting themes, selects interesting shots and adapts to evolve the entire parameter space, including the z-buffer, to generate or evolve a new visual grammar or syntax of the moving image.

*Travelogue: A recording of Minute Expressions (Travelogue)* is a generative work that explores this theme. The central motif of the work draws inspiration from Islamic art and Persian carpet making. The metaphor of the Persian carpet orients both *Travelogue* and artificial life, including themes of 'emergence,' self organisation and "lifelike behavior" <sup>38</sup> as *de rigueur*, into the longer genealogy of the human endeavour. Though much has been made of these themes in artificial life, <sup>39</sup> <sup>40</sup> their formation precedes artificial life in that they are well-honed principles in Islamic art and Islamic carpet making. <sup>41</sup> <sup>42</sup>

The Persian carpet is a also metaphor to describe the intercultural traffic in both Islamic art <sup>43</sup> and the overarching research into artificial life and generative art. This seems appropriate given the trade in and migration of epistemological, institutional, financial, re-

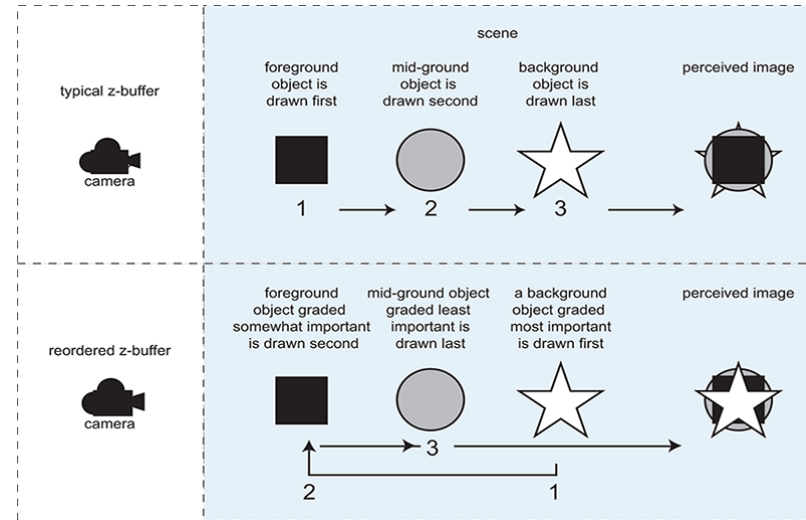


Figure 1. Schematic comparison between a conventional and reordered z-buffer. © Mark Guglielmetti, 2007. Used with permission.

Figure 2. Architectural model of the Trocadero Artspace. © Mark Guglielmetti, 2007. Used with permission.

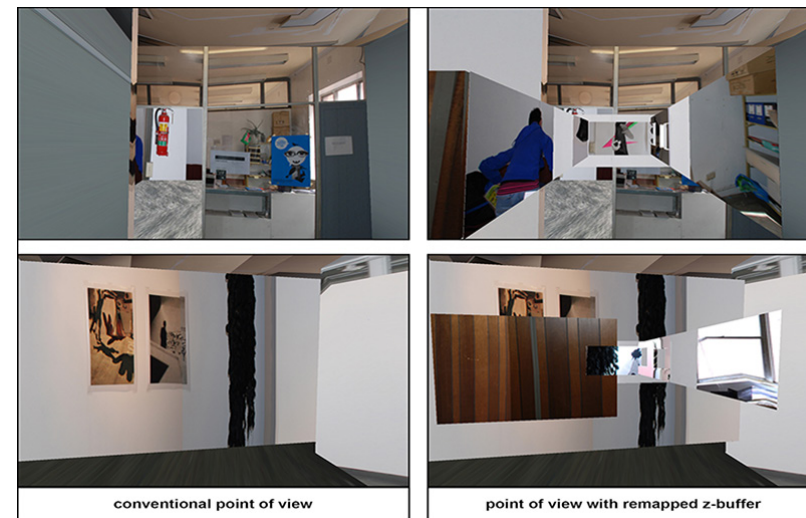
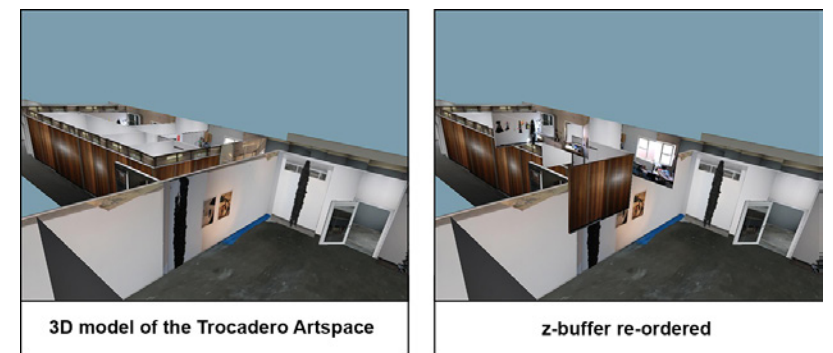


Figure 3. *Laboratories of Thought and Experimentation for Future Forms of Subjectivation*, Mark Guglielmetti, 2007. Software. © Mark Guglielmetti, 2007. Used with permission.



ligious and scientific discourse and artefacts in Islamic culture. In other words, *Travelogue* explores the trade in cultural artefacts, including the migration of encoded grammars and interpretative regimes and, the production of knowing subjects in “an unstill centre of a turning world.”<sup>44</sup>

The ‘world’ in *Travelogue* is seeded or initialised with statistical census data on tourism in Turkey, September 2010. Data from the “monthly number of arriving foreigner visitors” provides the initial resources to populate the work. Other data, such as “\$ spent per foreigner” and “number of foreigners of nationality and group of age-gender” populate other variables in the system, which are used to mathematically describe the drawing ‘agents’ (expressions). During ‘runtime’, the expressions exchange data with other expressions, but this ‘interaction’ is not visualised. The exchange of data between expressions provides various mathematical resources to other expressions, which enable the expressions to change scale, colour, location and number; similar functions enacted in other generative systems without personifying the expressions with slippery terms like ‘fight,’ ‘breed’ and ‘die.’

The work is displayed across multiple screens. One screen displays an orthographic view of the ‘world’, which references Persian carpet design and provides context to the overall system. This visualisation might be described as a re-imagination of the potential enfolding tourist trade in Turkey but just as well as an expression of the system. See Figure 4.

A second screen displays a view as expressed from the virtual camera *in* the ‘world.’ The virtual camera draws from a variety of grammars from the moving image, such as zoom and pan but also reorganises other grammars such as the z-buffer. The virtual camera/filmmaker shoots or *nframes* what is ‘interesting’ to

it – whatever that ‘interesting’ is, of course, immeasurable. See Figure 5. These views into the world render non-perspectival and *non-optical* images of the world, that is, images that do not favour or analogize the camera. See Figure 6.

In this light, the ‘virtual camera’ is, at best, an impoverished metaphor to describe the expressive potential for an *n* array of visual representations into and of 3D space. A more appropriate idiom for the interrelated algorithms that give rise to the view into 3D space might be “cameraless camera”<sup>45</sup> but this also evades the obvious, there is no camera; software mediates the view into virtual space.

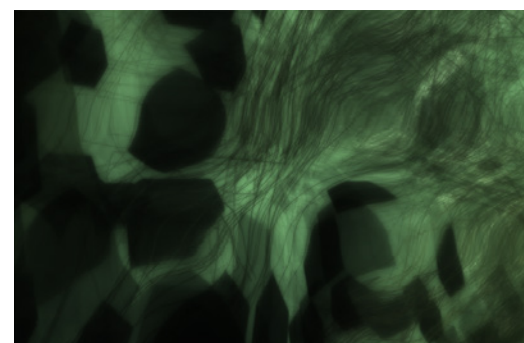
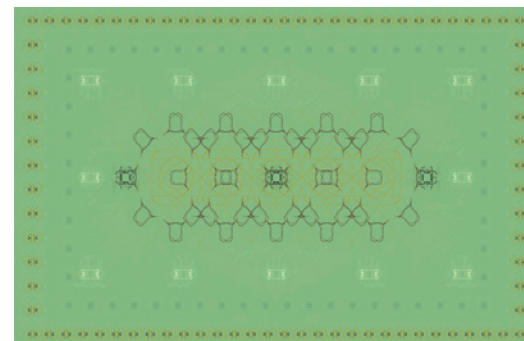
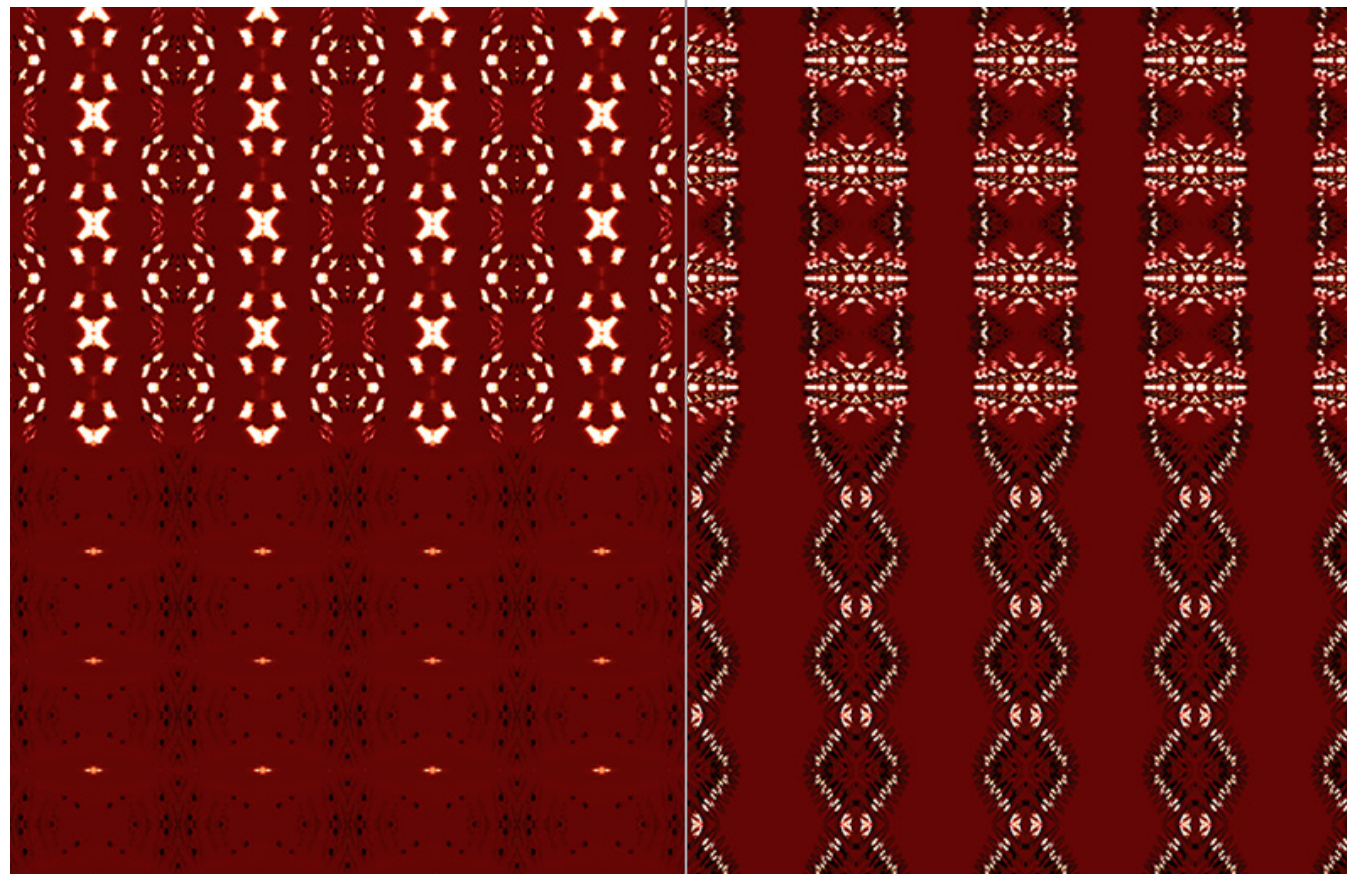


Figure 4, 5, 6. *Travelogue: A Recording of Minute Expressions*, Mark Guglielmetti and Indae Hwang, 2011. Code and software. © Mark Guglielmetti, 2011. Used with permission.

## CONCLUSION

Stan Brakhage understood what is at stake perhaps better than most writing:

*the increased programming potential of the IBM and other electronic machines now capable of inventing imagery from scratch. Considering then the camera eye as almost obsolete, it can at last be viewed objectively and, perhaps, view-pointed with subjective depth as never before. Its life is truly all before it. The future fabricating machine in performance will invent images as patterned after cliché vision as those of the camera, and its results will suffer a similar claim to ‘realism’, IBM being no more God nor even a ‘Thinking machine’ than the camera eye all seeing or capable of creative selectivity, both essentially restricted to ‘yes-no,’ ‘stop-go,’ ‘on-off,’ and instrumentally dedicated to communication of the simplest sort. Yet increased human intervention and control renders any process more capable of balance between sub-and-objective expression, and between those two concepts, somewhere, soul.*<sup>46</sup>

In digital media image making, there is an *n* array of potential to reorganise the visual field. From this array, I examine two, apparently disparate, research fields – artificial life and 3D simulation – both of which employ the virtual camera as the interface to 3D virtual worlds or visualisations. If artificial life is to truly generate life-like behaviour and emergence, what could be more lifelike than organising both the visual field and scopic regime/s, whatever they may be. After all, aligning the interpretive regime of artificial life image making into optical consistency with other forms of contemporary visual culture does no more, or less, than align competencies expressed in artificial life after the human endeavour. ■

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