Beyond space and time: Analysis of the arcane perceptual & cognitive effects in the art of Ivan Vukadinov at the Vatican Museums

Christopher Tyler[1,2], Lora Likova[1]

1. Smith-Kettlewell Eye Research Institute, San Francisco
2. City University of London

Abstract

In 2023, the Modern Art Collection of the venerable Vatican Museums celebrated the 50th anniversary of its founding. An anchorpiece chosen for this celebration is a remarkable work in the encaustic technique by Bulgaria's most famous artist, Ivan Vukadinov. Entitled "In Memory of the Heroes", this work typifies his oeuvre, which is deeply rooted in the rich history of art of the region, Thracia—a region with a cultural legacy predating much of Roman, Greek, and even Egyptian art, while simultaneously being at the cutting edge of modern artistic conceptualizations and inventive techniques. In this work, Vukadinov transcends millennia of existing preconceptions to evoke innovative explorations of deep cultural concepts, both in terms of the iconography and compositional philosophy. It gives the inexorable sense of moving powerfully beyond the bounds of space and time to embody a profound sense of the unstoppable force of the resurrected heroic spirit. Vukadinov transcends millennia of existing preconceptions to evoke highly innovative explorations of deep cultural concepts, both in terms of the iconography and compositional philosophy.
The present analysis delves into the extraordinary interpretative range of this evocative work - "In Memory of the Heroes"- uncovering explicit resonances and powerful contrasts that defy traditional interpretations. Moreover, it explores how, as an adept 'intuitive neuroscientist', Vukadinov also discovers and seamlessly integrates several uncharted perceptuo-cognitive mechanisms, shedding light on the depth and complexity of his artistic vision. [Ivan Vukadinov - Wikipedia](#)

Introduction

The year 2023 marked the 50th anniversary of the establishment of the Modern and Contemporary Art Collection at the esteemed Vatican Museums in 1973. For this celebration, the curators selected 10 keynote pieces from the overall collection of 9000 artworks to be highlighted in a distributed exposition throughout the galleries of the Vatican Museums. Each museum highlighted one of these selected works from the Collection, with the first gallery on the main level, the Gregorian Egyptian Museum, featuring an exceptional work created using the ancient encaustic technique in a unique combination with highly innovative custom techniques by Bulgaria's most renowned living artist, Ivan Vukadinov (Figure 1).

Figure 1. Ivan Vukadinov in 2019

Ivan Borisov Vukadinov (Bulgarian: Иван Борисов Вукадинов), born 19 March 1932, is considered to be "one of the greatest Bulgarian artists"[1], renowned for his deep conceptualizations and inimitable style, emblematic shapes and minimalist compositions. Vukadinov trained with Prof. Nenko Balkanski at the National Academy of Arts in Sofia (1961-1964), after which his style developed an economy of expression,

dense coloration and a Figurative Constructivist approach to explore the confluent influences of the past on present consciousness and cultural aesthetics.

A half-century odyssey

The remarkable story of the first – and so far the only – Bulgarian painting in the Vatican Museums begins with a solo exhibition of Ivan Vukadinov's works at the famous Marguttina Gallery in Rome in 1975, soon after the inauguration of the Vatican Museums' Collection of Modern and Contemporary Art by Pope Paul VI, which has now grown to more than 9000 works. Vukadinov's unique and powerful style is illustrated in the brochure for this exhibition (Figure 2). Following the Marguttina exhibition, the Vatican requested to purchase Vukadinov paintings, but the sale was blocked by the Bulgarian government on the grounds that these paintings were "a national treasure" [2], even though having a Bulgarian artist in the Vatican Museums would have been a great honor not only for the artist, but for the nation as well. To overcome this ban, Vukadinov proposed to donate the works to avoid the need of governmental permissions for a sale, but even this option was blocked by the Bulgarian government. At the same time, in Italy, in recognition of the power of his works, the artist was given the symbolic key to the city of Pisa, and offered a professorship in Rome, which he declined in order not to create political problems for his family.

Figure 2. Brochure for the Vukadinov Exhibition at the Marguttina Gallery, Rome, 1975.

This protest against the governmental restrictions, as a way to preserve his integrity and artistic freedom, changed Vukadinov's life forever, epitomized his unique approach to the artistic metier; art being the passion to which he fully devoted his life. While continuing to work intensively, he chose an ascetic lifestyle to avoid any dependencies, and was refusing to exhibit his paintings in Bulgaria or accept any of the highest medals and other forms of national recognition from the Bulgarian government over the next 40 years. This choice demonstrates his unprecedented integrity and strength of spirit. Despite avoiding the public eye and official recognitions, he has been, and continues to be, regarded as the most enigmatic, great, and mysterious of Bulgarian artists.

Year 2022: Acquisition of the Vukadinov's painting "In Memory of the Heroes" by the Vatican Museums

Now, a half-century after the initial dispute with the Bulgarian Government, the Vatican has successfully acquired Vukadinov's painting, which has become one of the most mesmerizing foci of the jubilee celebration of its founding. Entitled "In Memory of the Heroes," this work in the encaustic technique encapsulates the essence of Vukadinov's artistic vision, which is deeply rooted in the rich history of Thracia—a region with a cultural legacy predating much of Roman, Greek, and even Egyptian art. At the same time, it employs his inventive techniques to push the boundaries of contemporary artistic concepts. The work embodies a profound and dynamic force to exude an irresistible sense of transcending both space and time. Indeed, many perceive it as a modern-day depiction of Lazarus. Our analysis explores the extraordinary interpretative breadth of this evocative masterpiece, traversing realms of perceptual and cognitive allusions.

The artist was unable to attend the acquisition events, but Pope Francis himself met with the family to express his thanks for the Vukadinov's painting (Figure 3). For the official ceremony at the Vatican's Museums, the Director of the Museums, Barbara Jatta (Figure 4, center right) is flanked by Bulgarian officials - the Minister of Culture of Bulgaria and the Bulgarian Ambassador to the Vatican, with family members. In front in the audience are the lead Curator of the Collection, Micol Forti, cardinals, and Vukadinov's biographer.

Figure 3. Pope Francis met with family members to express his thanks for the Vukadinov painting. (Photo: The Vatican)

Figure 4. The formal ceremony at the Vatican Museums for the acquisition of Vukadinov's 'In Memory of Heroes' for the Vatican Collection of Modern and Contemporary Art, 10/10/2022 (Vatican News [3])

Collectible philatelic edition honoring Vukadinov's work

The same year, a further highly significant recognition of this particular artwork came in the form of the issuing of a Collectible Philatelic Edition of a postage stamp honoring Ivan Vukadinov with a reproduction of the "In Memory of the Heroes" (Figure 5).
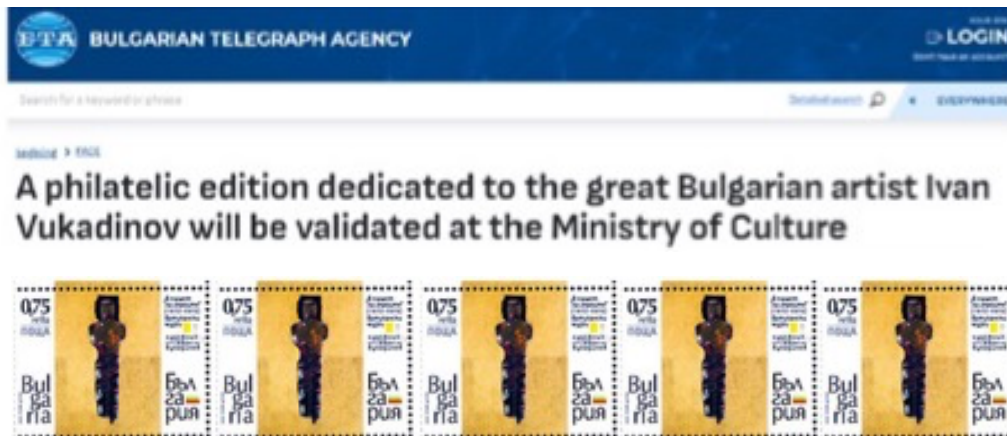

Figure 5. On December 19, 2022, the Ministry of Culture held a ceremony to validate and distribute a postal-philatelic issue on the theme "In Memory of the Heroes" (1973-1975), with a circulation of 5,500 stamps. The publication is dedicated to the painting by Ivan Vukadinov, which became the property of the Vatican Museums. This year, the distinguished Bulgarian artist was honored with the highest award of Ministry of Culture - Golden Age (neck chain). (*After BTA, Dec 2022*).

Year 2023: *Contemporanea 50.* Distributed exhibit of the Modern and Contemporary Art Collection of the Vatican Museums

2023 was an exciting year, marking the 50th anniversary of the historic establishment of the Modern and Contemporary Art Collection. To celebrate it, the Vatican organized a distributed exhibition of 10 keynote pieces from their overall collection of more than 9000 artworks, opened by the Pope himself (Figure 6). Each of the Vatican museums was used to highlight one work from the Collection, with the first museum on the main level, the Gregorian Egyptian Museum, featuring Ivan Vukadinov's exceptional painting "In Memory of Heroes", created with the encaustic technique originated by the ancient Greek painters.

Figure 6. Pope Francis meets artists from all over the world in the Sistine Chapel at the historic celebration of the 50th Anniversary of the Vatican Museums' Modern & Contemporary Art Collection. [4]
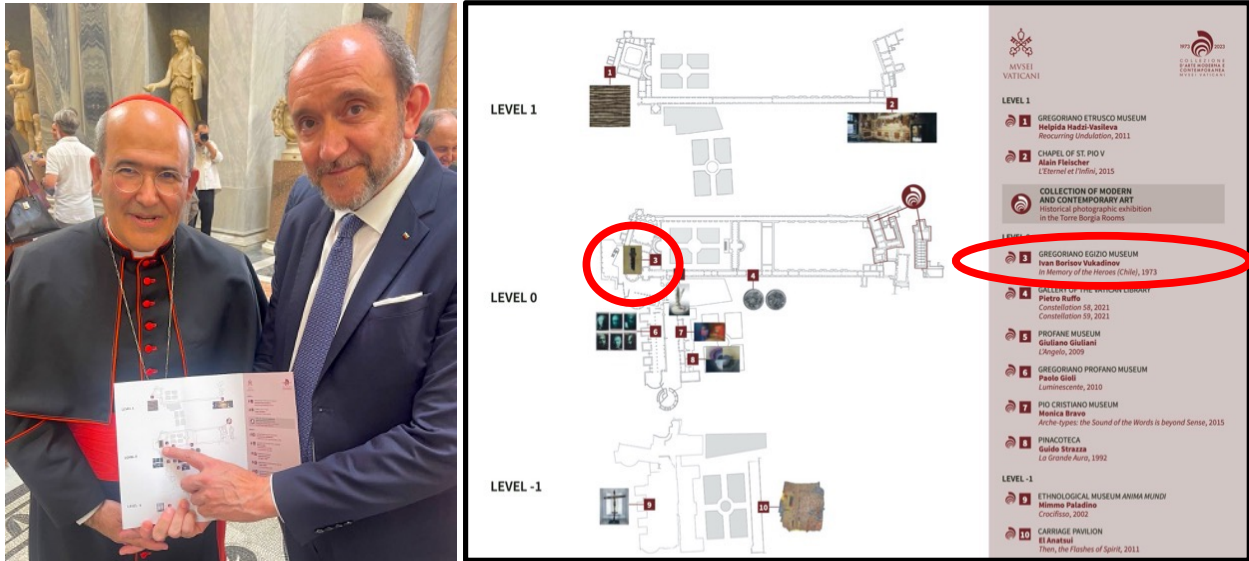
Figure 7. A: A Vatican Cardinal with the Bulgarian Ambassador indicating the location of the painting on the gallery guide. **B:** The gallery map of the entire exhibit. (Photo: The Bulgarian Embassy at the Vatican.)

The "In Memory of the Heroes" exhibit at the Vatican Museums

The distributed layout of the whole exhibition is indicated in Figure 7. The Vukadinov exhibit was mounted in prime position in its most fitting milieu – the Egyptian Museum – with which its ageless and enduring spirit is in haunting resonance. Figure 8 shows the display mounting of the painting *in situ* and its adjacent catalog description and analysis, flanked by a trio of granite Egyptian attendants who seem to be standing at attention to give respect to the heroic figure floating forward from its luminous surround of golden light.

Figure 8 **A.** The Vukadinov painting in its situation in the Egyptian Gallery. **B.** A sample of gallery visitors absorbing the impact of the artwork at close range.

As illustrated in Figure 9, it should be emphasized that it is almost impossible to capture the full sensory and evocative impact of the work in a photographic reproduction, as it generates such a variety of impressions depending on the lighting direction in relation to the thick impasto molding of the encaustic

medium and the dense granulated texture of the golden background. It has to be noted that no reproduction is comparable with the unforgettable experience of being in front of the painting as it rises above you, with the eternal figure of the Hero 'tornadoing', as it were, from the depth of the past behind the canvas, and pouring through the plane of the canvas forward toward the future, with focused determination.
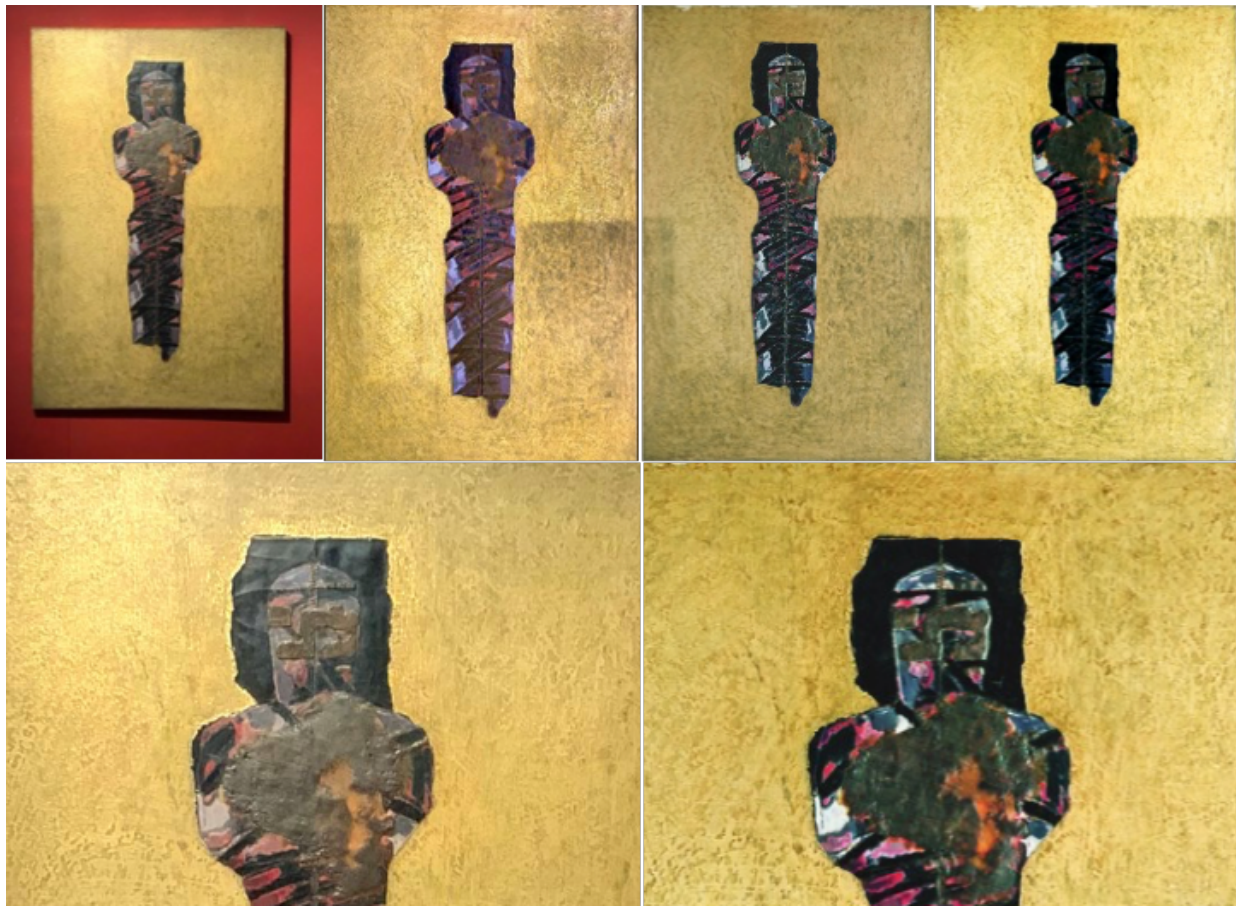

Figure 9. Various reproductions of the 'In Memory of the Heroes' painting illustrating the variety of diverse color and textural impressions captured in the different reproductions. The top row shows four full-length versions, while the lower row shows two details of the head and torso under different lighting directions.

Compositional Analysis

Figural iconography

The center of the canvas is dominated by a human form suspended in space, glowing with the life-force of burning embers, yet enfolded in contrasting funereal bindings (Figure 10). These bindings give the sense of the narrow figure being imprisoned in a form of eternal bondage, like the shackles chaining Prometheus to a rock. Yet the suspended figure gives a sense of *forward* and *upward movement* as it emerges from the golden texture of the encompassing surface. Is this figure elevating? Advancing? Receding? Even rotating? It has an indefinable sense of unfettered motion within the dark cavity in the surrounding rich field of light; a sense of emerging from the menacing past to evolve into a valiant future. These effects are clearly seen even from the photographic reproduction, but are much more strongly felt when the work is viewed in person.
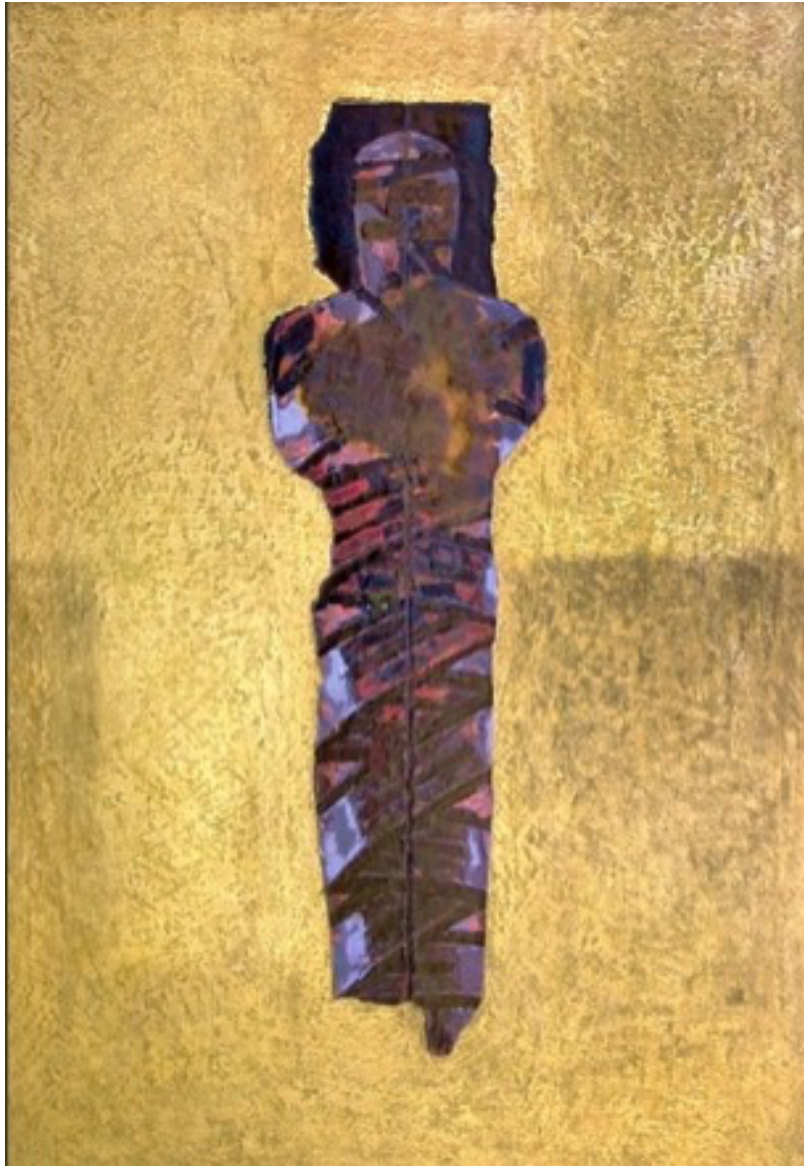
Figure 10. The full view of 'In Memory of the Heroes' by Ivan Vukadinov (1973).

The compositional feature of the golden background is laden with implicit references despite its unadorned simplicity. Like an Orthodox icon, the deliberate removal of any distracting symbolic objects or decorative context serves to highlight the central figure and emphasize the power of its presence, in contrast to in typical Western religious paintings, with their cluttered supporting cast of people and objects surrounding the central figures. Unlike Orthodox icons, however, on closer inspection the golden field is not just a uniform surface but has a rich texture with multiple textural references. In the one hand it evokes the historical gold treasures of the central European Bulgarian empire, the oldest gold artefacts of any human culture, while its granulated patina also brings to mind the sweep of the golden fields of grain that are so characteristic of the Thracian lowlands. Indeed, this aureate field alone would be a primary acquisition in any modern art gallery.

Beyond these material impressions, the resplendent power of this rich background also evokes the ephemeral essence of a light field, even evoking the sense of quantal fluctuations of the modern theory of light structure. Moreover, the golden trail of light behind and to the left of the figure, combined with the

forward step of elongated leg on the opposite side, give the sense that the figure is moving from the past to break through the vast object-free space of golden light of the canvas into the evanescent future.

This is an unprecedented technical achievement to in a painting from any era.

Physiognomic ambiguity

The head of the figure, with its unusual color and the squarish shape of its dark halo (Figure 11), projects further dramatic ambiguities. On the one hand, the head forms a lighter figural element embedded in the deep black surrounding of a mysterious Stargate-like 'portal' centered in the golden light-field, forming an amorphous head wearing a samurai's bandanna, while on the other hand it resembles a window through which you see distant spaces, fields, and objects, under a domed sky scudding with white clouds.

Then again, the percept can switch and the black surround can itself become a figure to form an unusual form of black halo around his head. In this view, it is like a chunk of the black rock to which the hero was chained, with a sense that he broke the rock and is still carrying this heavy black chunk attached to his head. In this way, the *figure can become ground* and the *ground become figure* at multiple levels of interpretation.

Figure 11. Detail of the head of the figure.

The face, too, is a whole painting in itself, rife with ambiguity. The features are lightly sketched to elicit multiple interpretations, appearing at one moment determined, with an unstoppable laser-beam focus of forward movement, *the master of his fate*. At the next, resigned, deflated, but still pressing on regardless of the cost. The more one contemplates the image, the more it is seen to embody its title 'In Memory of the Heroes' in the fullest sense.

In a more literal sense, if attention is focused on the antenna-like spiral along the midline of his forehead, it is infused with a sense of pain and anger as it evokes the sense that the hero has even been exposed to a vicious surgery in an attempt of rulers to gain control over his mind and soul as over his body. Both the idea and the technique expressing it represent further artistic innovations. The pink and red spots with irregular shapes no longer evoke flower gardens but are felt as open bloody wounds, revealed as the yellow-brown pieces of battered and broken bandages are ready to start falling down, revealing the wounded flesh

underneath. If the observer steps back to reflect, they convey the impression of emergence from a trance in which, at some deep level, they establish a phenomenal connection with the soul behind this entirely faceless visage. Indeed, in erasing the features of the face, the torture marks unwittingly sculpt a visage for all heroes, a symbol embodying not just one, but the essence of every nameless hero.

### The Artist as Intuitive Visual Neuroscientist

Formal perceptual analysis & novel perceptuo-cognitive illusions

In terms of formal elements, these evocations seem to derive – at least partially - from the paradoxical contrast between the dark aspects of the figure, which entail seeing it as a *recess*, and the local luminance and color contrast in the banding, which tend to give it a *forward momentum*. The oblique banding, so characteristic of the swaddling constraint of *Egyptian mummy wrappi*ngs, is simultaneously reminiscent of the *dynamic rotatory structure of a tornado* or funnel cloud.

The profound sense of *movement within a stationary aperture* in the painting calls to mind the perceptual effect of the moving stripes in the stationary aperture of the 'Barber-Pole Illusion' **(**Figure 12A**)**, where horizontal rotation of the striped cylinder around its axis produces the paradoxical perception of vertical motion of the oblique stripes (see arrow). This illusory direction of the motion is generated by the narrow vertical extent of the 'pole'. However, the (physical) Barber-Pole movement in this form, which is limited to the two-dimensional plane, is *transcended* by the *implicit 3D movement* in the Vukadinov composition, which drives *forward* into the conceptual future, implying a whole new type of cognitively-driven depth-movement illusion.
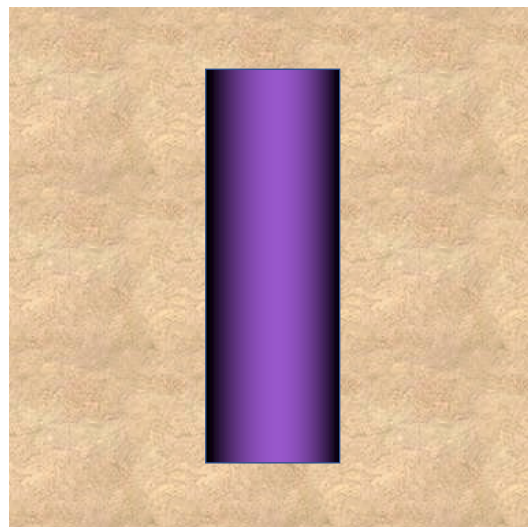
| A. | B. |

Figure 12. A. Barber-pole, in which the rotary motion is seen as upward translation (green arrow) by the aperture effect.
B. Formalized representation of the figure/ground elements of 'In Memory of Heroes' (see text for analysis).

Perceptual organization and triple ambiguities of figure/ground relationships

Global contextual processes such as *figure/ground categorization* have a fundamental importance in theories of shape processing, object recognition, and attention. The region of the visual scene categorized by the brain as a 'figure' tends to appear closer to the observer and usually represents an object, static or moving. The dividing contour 'belongs' to the figure and thus demarcates a shape for the figural region

only, while the ground is 'shapeless' and perceived as extended behind the figure and its contour [5,6]. Thus, delineation of the figure region is a primary requirement for shape recognition. What neural architecture allows local and global information to be combined rapidly, to provide for figure/ground categorization?

Interplay between competing depth-locations of the figure: In the Vukadinov work, the overall spatial composition is structured with a *figure/ground ambiguity* that is formalized into its core essence in Figure 12B. In general, a narrow bar on a uniform background is perceptually parsed as a figure *in front* of its background, but when it is *dark*, the relative brightness cue evokes the interpretation of *a recess or aperture* in the background, creating an interplay between competing depth-locations of the figure.

Depth ambiguity of a rounded form being enclosed in the aperture: Furthermore, to this figure/ground conflict is added the *depth ambiguity* of a rounded form being enclosed in the aperture, which tends *to come forward* as a convex bright 'cylinder-like' object while still remaining *trapped behind* the aperture margins.

Paradoxical subdued self-luminous quality: Moreover, the Vukadinov figure has *a subdued self-luminous qualit***y** despite the fact of its being overall darker than the intense luminous golden ground, an effect that we have attempted to capture in Figure 12B by the violet hue of the enclosed cylindrical form.

The masterful interplay between the *triple ambiguities* of these figure/ground relationships gives the seemingly simple composition a vibrant and dynamic perceptual and emotional impact that is *uniquely powerful* relative to the spectrum of *both contemporary and classical works of art* through the ages.

It is of interest to ask what is the basic neural mechanism of such figure/ground assignments that the artist is engaging. Which brain area designates one region as figure and the rest as ground? How is the border between them assigned to the figure? How are the designated regions differentiated in their assigned representations?
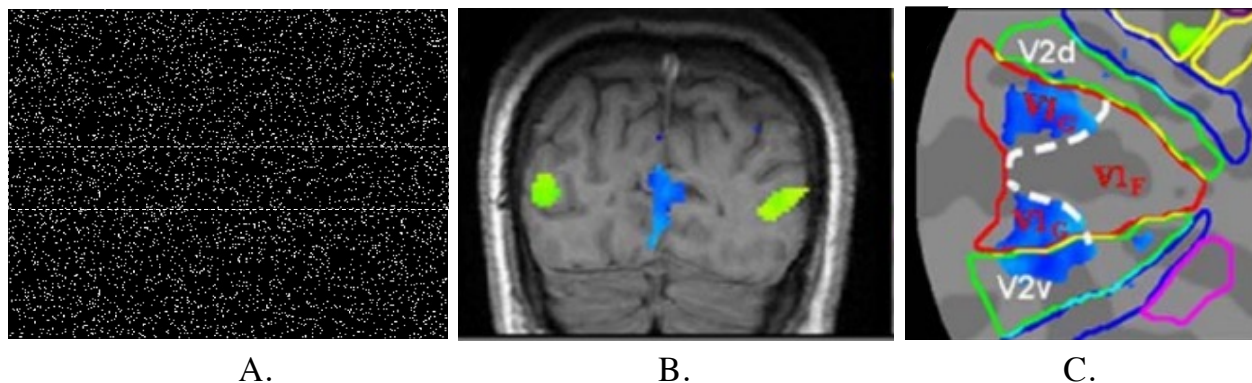

A.   B.   C.

Figure 13. Figure/ground spatial-structure created through temporal-asynchrony. A. Random-noise *figure/ground* configuration achieved solely by asynchronously updating the central (*figure*) region of random dots vs. the upper and lower *ground* regions. (The dashed line does not exist in the stimuli – it is added here to indicate the location of the perceived contour around the figure region.) **B.** Brain slice showing the primary activations to the figure/ground stimulus. Green coloration – positive activation in the classic motion area, hMT+; blue coloration – suppression relative to baseline level in the cortical projection of the ground fields in the primary visual cortex area (V1). **C.** Flatmap of the right occipital cortex showing the hierarchy of retinotopic visual areas V1-V3A/B. Dashed white line delineates the distorted cortical projection of the rectangular figure region in V1. (After [6]).

The first functional Magnetic Resonance Imaging (fMRI) study of figure/ground in human (Likova & Tyler [6]) have revealed a recurrent top-down brain mechanism, operating through neural suppression of the less-relevant retinotopic projection of the ground fields in the primary visual cortex, V1. The fMRI activation projected onto a flattened representation of the occipital cortex (Figure 13 B) shows that in V1 (red outline),

there is neural suppression (blue coloration) for the ground region, and a lack of activation within its figure region (delineated by the dashed white line). This response pattern implies that the brain mechanism of figural salience is *not* enhancement of the cortical representation of the figure region, but inhibition of the cortical representation of the less relevant non-figural (ground) regions. These, then, are just some of the core mechanisms evoked in the human brain when viewing the figure/ground organization in Vukadinov's 'In Memory of Heroes'. Presumably, when the figure *switches* to being seen as an *'aperture'* instead, the brain mechanism of suppression of the *ground region in V1* would be *inverted* to reconfigure as suppression in the *figure region of V1*, as reported in our further study [7].

Historical References

Transcendence resonances with and contrasts from the ancient Hellenistic world

Vukadinov's hero figure evokes the concept of a resurrecting Egyptian mummy from the (late) Hellenistic Fayyum era, but nevertheless makes a striking contrast with it, both - being a dark figure on a light ground, and - most importantly - with a powerful dynamism that is totally absent from the passively-wrapped mummy (Figure 14). The oblique binding of the Vukadinov figure evokes the Egyptian-style funereal wrappings, which were wrapped in a similar diagonal patterns. Here again, Vukadinov *transcends* any similarities, and follows his original and unexpected path. Whereas the Fayyum mummies seem to be swaddled into a narrow confined space, the Vukadinov hero emanates a muscular power of the ability to break through the bonds and take the future in stride.

Figure 14. Comparison of the Vukadinov painting with an Egyptian mummy from the Fayyum period: Adult male excavated by Flinders Petrie; Hawara, Middle Egypt; C.E. 80-120.

The Fayyum mummies have a wrapped body and an inserted facial portrait. In contrast, the Vukadinov hero has no such face/body separation: he is one whole figure, which surprisingly does not make it less but instead *more* dynamic and alive. One possible mechanism maybe that this holistic form avoids cognitive limitations based on knowledge about faces vs. bodies, etc., thus allowing the unfolding of unlimited manifestation of all of the above – and more - perceptual mechanisms and allusions.

Figure dynamics through a unique interplay with the spiral wrapping

Another remarkable difference can be seen by comparing in detail the diagonal wrappings of the two figures in Figure 14. While the Fayyum figure is firmly bound inside the opposing spirals, with its feet oddly visible but tucked securely in at the bottom, Vukadinov *again transcends* millennia of existing preconceptions and uses the bonds of the funereal wrapping *to unbind the figure to life and movem*ent through a unique interplay with the spiral wrapping. The *depth-structure-from-shading* makes appear that we are looking through it, seeing the back curve of the spiral like there is no body inside the wrappings. Moreover, this dynamic transparency *combines* with the unfinished curve of the figure's left leg, which appear like a knee of the leg stepping forward on our right. In conjunction with the depth-structure-from-shading, the result is a multiply ambiguous convex/concave rotational depth-structure *pushing the body forward* from the light field.

References to the raising of Lazarus

The Egyptian mummy references are themselves reminiscent of the Biblical story of the resurrection of Lazarus from his rock tomb, making explicit the concept that he was brought back from the dead to life in the world. Thus, as with the mummies from the Egyptian times, we find that although there is some figural similarity, it is limited to the form of the wrapping (Figure 15). The Vukadinov figure, on the other hand, is powerful, free-moving in space and alive, while the Lazarus figures are waiting passively for Jesus to come and release them from their tomb. They have been resuscitated with external help, while the Vukadinov hero had to bring himself out of his bondage to life and freedom by the power of his own will.

Figure 15. Comparison of 'The Raising of Lazarus' by Giotto (~1305), Duccio di Buoninsegna (~1300), Lippo Memmi (~1325), with the Vukadinov work.

Classical Greek and Roman references

The heroic content of the Vukadinov painting further relates to the classical mythology of the Greek hero of Prometheus, the god of fire and civilization, depicted in Figure 16 creating the first human from a lump of clay in a Roman wall painting. Athena is leaning forward ready to give life to the inanimate clay figurine. In this case, it is the figurine that seems to embody the spirit of the captive, about to break out of its primordial material to proliferate into to the Adamic role of the progenitor of the human race.

Figure 16. Roman fresco of Prometheus molding the human form out of clay, while Athena awaits to animate it with the life force.

(C2nd CE, Via Ostiensis Necropolis, Rome).

A similar theme is found in ancient Egyptian mythology, where the Egyptian god Khnum was depicted making the first human from clay on potter's wheel, assisted by the Frog Goddess Heket (Figure 17A). Like the Vukadinov painting, the clay figurine seems to be suspended in space on a revolving platform, and has an interesting icon floating above its head interpretable as its life spirit. In a similar fashion, the human form in 'In Memory of the Heroes' can be viewed as emerging from its golden chrysalis into an expansive future as the epitome of striving humanity.

A.
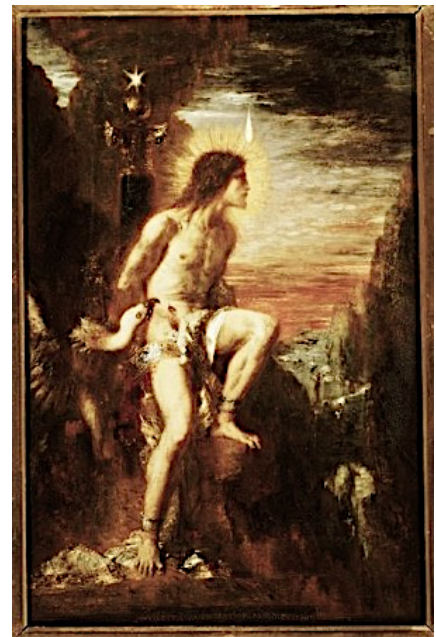
B.

Figure 17. A. The ram-headed Egyptian god Khnum prefiguring the Prometheus story by making first human from clay on potter's wheel assisted by the Frog Goddess Heket. Roman-era bas-relief from the temple of Hathor, Dendara. Photo courtesy of Aidan McRae Thomson. https://www.flickr.com/photos/amthomson/28135599979. **B**. 'Prometheus Bound' by Gustave Moreau (1868).

Did the artist unknowingly paint himself and his future life story?

While combining these artistic, perceptuo-cognitive discoveries of multi-paradoxical formal elements, encaustic and innovative techniques, the painting evokes the grand emotions of its title, depicting one who suffered immensely, but overcame all challenges, broke the chains and victoriously manifested the power of the unquenchable Promethean spirit across space and time (Figure 17B). He seems to emerge from the jagged aperture "bloody but unbowed". In fact, it forms a remarkably apt visual expression of the heroic poem "Invictus" by William Henley (1875):

> In the fell clutch of circumstance
>> I have not winced nor cried aloud.
> Under the bludgeonings of chance
>> My head is bloody, but unbowed.
>
> Beyond this place of wrath and tears
>> Looms but the Horror of the shade,
> And yet the menace of the years
>> Finds and shall find me unafraid.
>
> It matters not how strait the gate,
>> How charged with punishments the scroll,
> I am the master of my fate,
>> I am the captain of my soul.

Conclusions

We have attempted to capture at least a portion of the wealth of references evoked by Vukadinov's 'In Memory of the Heroes' across several ancient cultures. His corpus of work can be seen as going beyond the explicit resonances to powerful contrasts that escape conventional interpretations to evoke highly innovative explorations of deep cultural concepts, both in terms of the iconography and the painting techniques, as well as in terms of discovering and implementing numerous novel perceptual and cognitive illusions.

In this way, Vukadinov transcends millenniums existing preconceptions, such as using binding means like funeral wrapping to unbound back to life and free movement through space and time. As an intuitive neuroscientist, he also discovers and masterfully implements numerous novel perceptual and cognitive illusions in a naturally integrative manner. The resuscitation of his eternal hero – an embodiment of all heroes - happens without external help, to bring himself to life and freedom by the power of his own will. Vukadinov's inimitable genius is evident in the way that this particular painting expresses a profound sense of a personal resurrection of the body through the eternal power of the spirit of the true hero across time and culture to evoke the ageless uplifting of the soul.

Christopher W. Tyler, PhD, DSc*, is Head of the Brain Imaging Center at the Smith-Kettlewell Eye Research Institute, San Francisco, and a second appointment as Professor of Optometry and Vision Science at City University of London, with extensive research and publications in visual neuroscience and the analysis of artworks throughout history. Email: cwt@ski.org.*

Lora T. Likova, Ph.D*., has a multidisciplinary background encompassing studies in cognitive neuroscience, computer science, perception, psychophysics, with patents in the field of magnetic physics and many years of experience in human vision and brain*

imaging. She is the Founder & Director of "Brain Plasticity, Learning & Neurorehabilitation Lab" at Smith-Kettlewell Eye Research Institute in San Francisco. Dr. Likova uses artistic drawing as the cornerstone of her breakthrough methodology for enhancing brain plasticity in blind rehabilitation research, memory, and cognition improvement. She also co-organized the foundational 2008 NSF International Workshop on Art, Creativity, and Learning in Washington DC. Email: lora@ski.org

References

1. Nesheva, N. 'Kilometer queue for the exhibition of Ivan artists, Sofia', National Labor Newspaper, p. 16, Jan 9, 2007. Bulgarian Portal for Art. Encyclopedia. Sept 02, 2013.

2. Bulgarian Portal for Art. Encyclopedia. Sept 02, 2013.

3. https://www.vaticannews.va/en/vatican-city/news/2023-06/50-years-vatican-museums-modern-contemporary-collection.html

4. Ganchev, D. (Димитър Ганчев) Иван Вукадинов, първият български автор в колекцията на Ватиканските музеи (Ivan Vukadinov, the first Bulgarian artist in the collection of the Vatican Museums)".Vatican News, October 10, 2022.

5. Wertheimer M. *Untersuchungen zur Lehre von der Gestalt*, II. *Psychologische Forschung.* 4:301–350. (Translated extract reprinted as "Laws of organization in perceptual forms.") In W. D. Ellis, Ed., A source book of Gestalt psychology (pp. 71–94). London, U. K.: Routledge & Kegan Paul Ltd, 1938.

6. Likova, L.T. and Tyler, C.W. Occipital network for figure/ground organization. Experimental Brain Research, 189, 257-267, 2008.

7. Likova, L.T. and Tyler, C.W. Instantaneous stimulus paradigm: cortical network and dynamics of figure-ground organization. In Human Vision and Electronic Imaging XII 6492, 509-516, 2007.