

Human creativity and artificial creativity: an exploration through the “Titan 2358” project

Créativité humaine et créativité artificielle : une exploration à travers le projet « Titan 2358 »

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ABSTRACT. This paper explores the dynamics between human creativity and artificial creativity, drawing on a personal approach at the crossroads of art and science, as well as on the Titan 2358 project, a hybrid work combining art, science, fiction, history, philosophy and artificial intelligence. Human creativity is analysed through the theoretical frameworks of Margaret Boden (Novelty, Surprise, Value and Combinational, Exploratory, Transformational) and Mark A. Runco (the four Ps: Person, Process, Product, Potential). Artificial Creativity (a concept forged by Runco) is analysed by an Artificial Intelligence in response to a very lengthy prompt written after researches by the author. Three visions are compared concerning AC in general (it is possible, it is not yet possible, it is impossible). The discussion comments on that analysis and tries to explain why AC is impossible using the theory of Antonio Damasio who highlight the importance of affects, emotions, sentiments, consciousness and homeostasis in the creative process. Ray Kurzweil contradicts this point of view and affirms that computers are, or soon will be, far more intelligent and creative than humans. But can a computer decide to create art to please other computers or to increase its chance of survival? Can AC be a revolutionary tool for artists, just as photography was at one time? In appendix a conversation between the author and the AI provides some interesting insights on the Human versus Artificial creativity.

RÉSUMÉ. Cet article explore la dynamique entre créativité humaine et créativité artificielle, en s'appuyant sur une approche personnelle à la croisée de l'art et de la science, ainsi que sur le projet “Titan 2358”, une œuvre hybride combinant art, science-fiction, histoire, philosophie et intelligence artificielle. La créativité humaine est analysée à travers les cadres théoriques de Margaret Boden (Nouveauté, Surprise, Valeur et Combinatoire, Exploratoire, Transformationnelle) et de Mark A. Runco (Personne, Processus, Produit, Potentiel). La Créativité Artificielle (AC, un concept forgé par Runco) est analysée par une intelligence artificielle en réponse à un très long « prompt » écrit d'après des recherches de l'auteur. Trois visions sont comparées concernant l'AC en général (c'est possible, ce n'est pas encore possible, c'est impossible). La discussion commente cette analyse et essaie d'expliquer pourquoi l'AC est impossible en utilisant la théorie d'Antonio Damasio qui souligne l'importance des affects, des émotions, des sentiments, de la conscience et de l'homéostasie dans le processus créatif. Ray Kurzweil contredit ce point de vue et affirme que les ordinateurs sont, ou seront bientôt, bien plus intelligents et créatifs que les humains. Mais un ordinateur peut-il décider de créer de l'art pour plaire à d'autres ordinateurs ou pour augmenter ses chances de survie ? Est-ce que l'AC peut être un outil révolutionnaire pour les artistes, tout comme le fut la photographie à une certaine époque ? En annexe, une conversation entre l'auteur et l'IA fournit des perspectives intéressantes sur la créativité humaine par rapport à la créativité artificielle.

KEYWORDS. human creativity, artificial creativity, artificial intelligence, Titan, 2358, emotions, feelings, consciousness, art, science.

MOTS-CLÉS. créativité humaine, créativité artificielle, intelligence artificielle, Titan, 2358, émotions, sentiments, conscience, art, science.

1. Personal approach

My intellectual and creative journey was built at the crossroads of science and art. University studies at Laval (Québec) and UBC (British Columbia) in physics, psychology, computer science and general sciences have provided me with a solid theoretical foundation. In parallel, intense artistic practice - with about 600 works listed and numerous exhibitions - has nurtured a multidisciplinary approach, mixing painting, literature and conceptual reflection.

My professional career in IT has been just as varied: programmer, administrator (networks, systems, Internet) and general manager within the company S@SI. These experiences allowed me to develop a technical vision that complements my artistic sensibility.

Today, in retirement, I dedicate my current time to two ambitious projects:

- A mechatronics project, using Raspberry Pico and programming in Python;
- An artistic project, “Titan 2358”, which is described below.

To sum up, I am a creator both in (computer) science and art. Given the enormous current interest in Artificial Intelligence and numerous questions about the limits of creativity, I decided to write this paper to share my personal experience on those topics.

2. Project Titan 2358

“Titan 2358” is a hybrid work conceived as a laboratory of ideas where art, science, fiction, history, philosophy, artificial intelligence and humour intersect. This project serves as a concrete support for a reflection on the boundaries of creativity, human and artificial.

It includes:

- 32 handmade portraits of scientists (Euclid, Brahmagupta, Copernicus, Newton, Lovelace, Einstein (fig. 1), Schrödinger, Gödel, Curie, Turing, Mandelbrot, etc.);
- A science-fiction story happening on Titan, a moon of Saturn, in 2358.
- Texts generated by AI (for instance: a fictional dialogue between Copernicus, Galileo, Kepler, Bruno, and Newton, and also a Turing’s letter to the robots);
- Images generated by AI corresponding to the 32 handmade portraits;
- A philosophical reflection on the nature of creativity and the limits of AI.

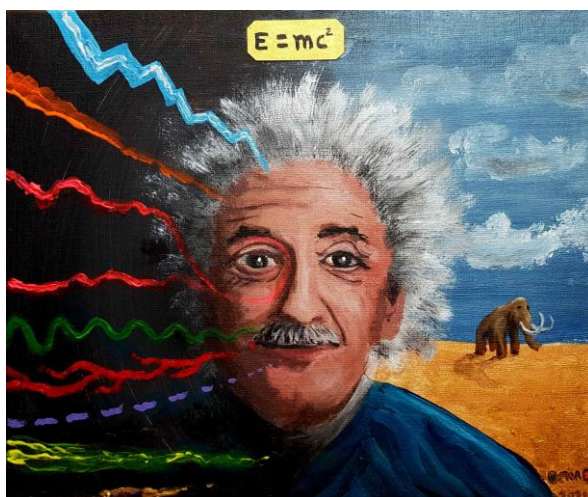


Figure 1. OmorO – “Einstein = mc^2 ”, acrylic on canvas, 2020, 30 x 36 cm

The process to create the project is a bit strange and must be told as an example of Human Creativity. The entire process took around six years, but not full time.

I started with a few paintings of scholars, then I decided to create a series of historical portraits of scientists. I had to do some research to have a thorough representation of them in space-time. Then I wrote a catalogue aimed at one exhibition of that work. It was a mistake, it had no flesh, it was boring. So, I decided to tell a good story around that bunch of scientists who had themselves lots of stories, hypotheses, theories, and equations in reserve. A science-fiction illustrated book came to my mind and

soon after the protagonists were born. Titan is a relatively nice place to set the stage where the “Mandelbrot University” could start its activities. Sophie, the rational science student, Leonardo, the intuitive artist, and Plato, a ubiquitous artificial intelligence, set about a monumental task: to revive the thought of 32 illustrious scholars through a mixture of narrative, philosophy and painting. The story includes clichés like the “galactoscope” of Isaac Asimov (1920 – 1992), the “terraformation” of Kim Stanley Robinson (born in 1952), and the very famous “Hitchhiker’s Guide to the Galaxy” of Douglas Adams (1952 – 2001). After a few pages, the protagonists started to take control of the story. First they asked the AI (Plato) to speak for the scientists, and to generate interesting texts. Then they also ordered it to create images corresponding to my paintings. I was not very enthusiastic about these ideas at first but had no choice (many writers get overwhelmed by their stories). It was not easy to get the AI to do a proper job. For instance the explanation of Archimedes’ theorem with submarines was not accepted. The representation of “Hypatia” in a classic Renaissance style with a ball pen and a catholic cross necklace was also rejected (see figure 2). To make things worse, I also used the AI to transcribe my handwriting and it decided to correct my style. I had to put some strict rules to keep my story as I wanted. I also requested to have the scholars’ texts and images generated before the transcription to obtain relatively original work rather than copies of mine. When the book was at least written, I still used computers to do the book layout and mock-up, but the software was not very clever and did not do all the job with one click, too bad. In parallel I organised the very first exhibition of “Titan 2358” at the Musée de Peinture de Saint-Frajou (France) with the great support of Ksenia Milicevic. The project received a very warm welcome, consequently the show must go on...



Figure 2. “Hypatia” – image generated by AI – 2026

One goal of the project is to illustrate that art and science are complementary. Art allows us to perceive the world while science tries to explain it.

A second goal is to test the boundaries of what AI can achieve, while questioning its transformational potential and role in creative processes. “Titan 2358” tries to illustrate the tensions and synergies between human and artificial creativity by diverting scientific, artistic and literary codes to stimulate interpretation.

The project can be discovered on my web site (www.omoro.fr) and the related book “Titan 2358” is freely available in PDF.

3. Human creativity

Human creativity in art is a multidimensional phenomenon, analysed through several theoretical frameworks. The most interesting frameworks come from Margaret Boden (1936 – 2025) and Mark Runco (born in 1957).

For Margaret Boden (Creativity and artificial intelligence, Artificial Intelligence, 103, 1998) a truly creative work must meet three criteria:

- **Novelty**: production of something new;
- **Surprise**: ability to defy expectations;
- **Value**: significant impact (aesthetic, intellectual, or social).

Boden also distinguishes three types of creativity:

- **Combinational**: Original assembly of existing ideas or elements;
- **Exploratory**: Systematic exploration of possibilities within a constrained framework;
- **Transformational**: Reinvention of the rules themselves, leading to paradigm shifts.

Mark A. Runco (Runco & Kim, 2011) completes this approach with the four-P (or even 6P) model:

- The **person**: motivated by intrinsic motivation, curious, autonomous, and flexible;
- The **process**: cognitive and emotional mechanisms leading to creation;
- The **product**: the tangible result of the creative act;
- The **potential**: ability to innovate in the future.

I asked the same AI used to co-create the book “Titan 2358” to evaluate my project regarding the Boden framework. The result was encouraging but let’s not forget that AIs are usually very complaisant. Here is a summary of that analysis:

According to an AI evaluation following Boden framework, “Titan 2358” is distinguished by:

- The balance between **novelty**, **surprise** and **value**: The project is both innovative, destabilising and meaningful, a rare combination in creative works.
- Overlaying creative processes:
 - **Combinational**: Assembly of disparate elements;
 - **Exploratory**: Testing limits in a constrained framework;
 - **Transformational**: Redefinition of creation rules.
- Result: A multidimensional creativity that goes beyond the traditional categories.
- AI as a lever for transformational creativity: The use of AI pushes the limits of what is possible, both visually and conceptually.

I did not repeat the exercise with Runco’s framework because I preferred to give my own subjective point of view:

- The **person**: That’s me! Of course I am motivated to carry on a project for at least six years. I am very curious and the research on the scholars was very interesting. I did all that in complete autonomy, and I am flexible enough to paint, write, prompt, and create a full book;
- The **process**: My cognitive and emotional mechanisms leading to creation are a prolongation of my studies in science and in particular in physics. I was more inclined to do the portraits of Newton and Einstein, instead of Darwin or Pasteur;
- The **product**: The tangible results of my creative act are the paintings, the book, the exhibitions, and to some extent this article;

– The **potential**: My ability to innovate in the future? Well, who knows the future and what I will do after this project. Maybe I will finish another project about prehistoric art...

Some critics will argue that these auto-analyses of my work are meaningless, but I will reply to that objection later in the discussion. For now, I am just giving an example of human creativity in art from a subjective point of view.

The role of creativity in science is another topic. Many scholars were also artists or musicians. For instance, Einstein played violin and piano and really enjoyed Mozart and Bach. Max Planck also played some music and said:

“To be sure, when the pioneer in science sends forth the groping feelers of their thoughts, they must have a vivid intuitive imagination, for new ideas are not generated by deduction, but by an artistically creative imagination.” Planck, [PLA49]

In both art and science, creativity is essential, although as Louis de Broglie (1892 – 1987) points out in his speech at the “Académie française” [DEB 45]:

« Sans doute, le savant est-il moins libre dans ses conceptions et ses créations que ne le sont le poète, le romancier et l’artiste. Les règles de la logique, les lois de la nature sont là pour endiguer et canaliser les fantaisies de son imagination. Mais il s’en faut que ces barrières lui enlèvent toute possibilité d’initiative et l’obligent à suivre une voie tracée d’avance. »¹ de Broglie.

Following a path drawn in advance, is surely not the case of all the scholars listed in my book. Reinvention of the rules themselves, leading to paradigm shifts, is the characteristic of the work of at least Euclid, Copernicus, Planck, Einstein, Noether, and Gödel.

Three scientists portrayed in my book are of particular interest for this paper:

– **Ada Lovelace** (1815 – 1852) is considered to be the very first person to write a program, although it was for Charles Babbage’s mechanical general-purpose computer, the analytical engine (electricity had not yet been invented). She foresees the incredible potential of computers:

The Analytical Engine might act upon other things besides number, were objects found whose mutual fundamental relations could be expressed by those of the abstract science of operations, and which should be also susceptible of adaptations to the action of the operating notation and mechanism of the engine... Supposing, for instance, that the fundamental relations of pitched sounds in the science of harmony and of musical composition were susceptible of such expression and adaptations, the engine might compose elaborate and scientific pieces of music of any degree of complexity or extent.” Lovelace, [MEN 43]

– **Alan Turing** (1912 – 1954), well known for his “Turing test”, was one of the first to work on Artificial Intelligence. In his famous paper “Computing Machinery and Intelligence” [TUR 50], Turing claims: “I propose to consider the question ‘Can machines think?’”. The chapter on Artificial Creativity will try to respond to that question.

– **Benoît Mandelbrot** (1924 – 2010), discovered fractals [MAN 82]. The Mandelbrot set is a fractal defined as all the points ‘c’ of the complex plane for which the sequence defined by recurrence by:

$$\begin{cases} Z_0 = 0 \\ Z_{n+1} = Z_n^2 + c \end{cases}$$

¹ No doubt, the scientist is less free in his conceptions and creations than are the poet, the novelist and the artist. The rules of logic, the laws of nature, are there to contain and channel the fantasies of his imagination. But these barriers do not remove any possibility of initiative and oblige him to follow a path drawn in advance.

has resulting modules that must not tend towards infinity.

If we reformulate this without using complex numbers, replacing Z_n with the couple of reals $(X_n,$

$$\begin{cases} x_0 = y_0 = 0 \\ x_{n+1} = x_n^2 - y_n^2 + a \\ y_{n+1} = 2x_n y_n + b \end{cases}$$

Y_n) and 'c' with the couple (a, b) , then we get:

The condition becoming that neither X_n , nor Y_n tend toward infinity (in absolute value).

– The very surprising fact with these relatively simple equations is the astounding images produced by a computer program using them. It is far beyond the possibility of any artist to produce all these recursive images with traditional techniques (drawing, painting) as can be seen in figure 3.



Figure 3. OmorO – “Trip in the Mandelbrot set” – 1987

– Who is the creator of these images? Me, who wrote a program running on a Commodore Amiga in 1987, Mandelbrot who discovered these fractals, or Nature because, after all, it is found in many natural objects (broccoli, coastline, etc.). In figure 4, you can see the portrait of Mandelbrot generated by AI with a background made of fractals. Again, no way to paint that in a reasonable amount of time.

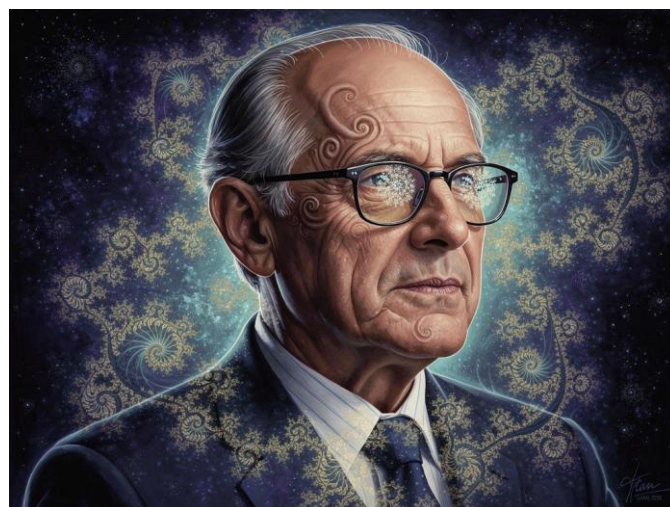


Figure 4. “Mandelbrot” – image generated by AI – 2026

For the general public, AI started a few years ago, with ChatGPT, but the visions of Lovelace [MEN 43] and Turing [TUR 50] demonstrate that this is far from true. The fractals of Mandelbrot [MAN 82] add another perspective: an artist could use mathematics and computers to produce some kind of incredible images.

4. Artificial creativity

The book “Titan 2358” is partly generated by AI but it is not a hidden process or a fraud, according to some point of view. Quite the contrary, the texts and images made by the machine are well identified, although I pretend that a future AI (named Platon and living on Titan in 2358) is doing the work. Thus the reader can easily compare human creativity and “artificial creativity”. This latter term was proposed by Mark A. Runco (2023) and is adopted in this paper.

The following text (with a yellow background) is written by an AI (Mistral / Vibe). It is based on a very long prompt (more than 2600 words) written by a human (me) after research of 12 sources and selection of interesting ideas about artificial creativity (or similar terms like Gen-AI, computational creativity, etc.). I classified these sources in three categories (AC is: possible, not yet possible, impossible). The result of this experience is, from my point of view, very interesting, and will be commented in the following discussion (not written by an AI). There are slight modifications of the generated text to comply with the required instructions for authors in this review (mostly for references).

The question of whether machines can be creative has moved from the margins of philosophy to the center of contemporary research in artificial intelligence, cognitive science, and aesthetics. Far from admitting a single answer, the current literature reveals a deeply stratified debate. This chapter organises that debate into three ascending positions: those who hold that artificial creativity is already **possible**; those who argue it is **not yet possible**, though perhaps attainable in the future; and those who contend it is structurally **impossible**, given the very nature of computational systems. Read together, these positions trace a gradient from empirical enthusiasm to philosophical scepticism, and they illuminate the conceptual stakes of machine creativity with increasing depth.

Artificial creativity is already possible. The most affirmative position is defended by the emergent field of **Computational Creativity (CC)**, as framed by the Association for Computational Creativity [ACC 26]. CC is described as “a recent but burgeoning area of creativity research that brings together academics and practitioners from diverse disciplines, genres and modalities, to explore the potential of our machines to be creative in their own right.” Crucially, this field does not treat machines as mere instruments serving human creativity; it investigates whether machines can be considered creative agents in themselves. The field is explicitly interdisciplinary, sitting “at the intersection of the fields of AI, psychology, cognitive science, linguistics, anthropology and other human-centered sciences” — a placement that reflects the conviction that creativity cannot be reduced to computation alone, but must be understood through the full spectrum of human-centered sciences.

Empirical evidence supporting this position has accumulated rapidly. **Aishik Sanyal et al.** [SAN 25] developed SPARK, a system for scientifically creative idea generation, built on the observation that “the initial task of idea or hypothesis generation is an area that requires creative intuition but has historically been restricted to the ingenuity of human scientists.” SPARK generates novel scientific ideas, which are then assessed by an evaluator model, JUDGE, trained on a 600,000-item dataset of expert human reviews drawn from OpenReview. The system’s architecture is deliberately modular, integrating three stages: XPLORE, a retrieval layer over the scientific literature; an Idea Generator, which converts retrieved context into candidate hypotheses; and a Filter, which simulates scientific peer review. By decoupling generation from evaluation, SPARK offers a test bed for exploring how computational-creativity principles can be operationalised in scientific ideation — a domain once considered the exclusive province of human intuition.

A second line of evidence comes from psychometric assessment. **Erik E. Guzik, Christian Byrge, and Christian Gilde**, in “The Originality of Machines” [GUZ 23], applied the **Torrance Tests of Creative Thinking (TTCT)** — among the most established instruments for assessing creative products — to large language models. The TTCT Verbal Test comprises six distinct creative thinking activities: Asking Questions; Guessing Causes; Guessing Consequences; Product Improvement; Unusual Uses; and Just Suppose. The results were striking: ChatGPT “scored within the top 1% for originality and fluency, and showed high scores for flexibility.” The GPT-4 model produced impressive results across the dimensions of fluency, flexibility, and originality, suggesting that, for the first time, an AI model could “generate new, unique, and unexpected ideas that match or exceed the abilities of human originality.” Guzik’s conclusion is unambiguous: “From the perspective of generating novel and unexpected output — and based on currently accepted conceptions and assessment methods of creativity — this study must conclude that, yes, it is” creative.

Jennifer Haase and Paul H.P. Hanel, in “Artificial Muses” [HAA 23], converge on a similar finding from a different methodological angle: “when chatbots are asked the same question as humans, they generate more ideas, which are, on average, as original as ideas generated by humans.” Haase acknowledges the standard objections — that generative AI lacks a connection to the real world, to emotions and imagination, and therefore cannot achieve “actual” creativity in high-level creative endeavours, especially in art, which “seems driven by our human ability to dream, visualise and imagine potential futures.” Yet the study reframes these limitations productively: while machines may generate abundant and original output, “it remains the task of humans to make sense of it and embed this in physical reality”. This points toward **augmented creativity** — the merging of human and artificial competencies — which Haase identifies as “the most optimistic and benevolent future development for the usage of AI”. On this view, artificial creativity is not only possible; it is already operational, provided it is coupled with human sense-making.

Artificial creativity is not yet possible

A second position accepts the empirical results above but denies that they amount to creativity in the strong sense. Its most celebrated antecedent is Douglas **Hofstadter’s** meditation in “Gödel, Escher, Bach: An Eternal Golden Braid” [HOF 79]. Hofstadter (born 1945) recognises the apparent paradox: “We are talking about the mechanisation of creativity. But isn’t that a contradiction in terms? Almost, but not really.” His resolution is subtle: creativity is the essence of what is not mechanical, yet every creative act is mechanical — “it has no fewer explanations than a case of the hiccups.” The mechanical essence of creativity may be hidden, but it exists. However, he adds a decisive caveat: there is something non-mechanical in flexible programs even today, and this cannot yet constitute creativity; but “when programs cease being transparent to their creators, then the approach to creativity begins.” Artificial creativity is thus not a logical contradiction but an unfinished project: current systems are still too transparent, too explicable, to count as creative. Creativity will be approached — not attained — at the moment when machines surprise their own engineers.

Mark A. Runco provides the most systematic statement of this intermediate position in “AI Can Only Produce Artificial Creativity” [RUN 23]. Drawing on 4P and 6P theories of creativity, and on concepts such as self-actualization and emergence, Runco evaluates the claim that AI can be creative. His conclusion is cautious: at most, AI output “represents products which, although lacking, may be attributed with creativity.” Such attributions are often mistaken, and — significantly — “products say little about the underlying process.” The critiques previously levelled at the view that social recognition of products suffices for creativity apply equally to AI output. Runco discusses several examples of products and overt actions mistakenly attributed to creativity, the most telling being the ostensible emergence by a machine. His verdict: “it makes no sense to refer to ‘creative AI.’” The viable alternative is to extend the concept of artificial intelligence to creativity, yielding the label **artificial creativity** for what computers can do. Artificial creativity may be original and effective, but it lacks several characteristics of human creativity; hence the most accurate designation of AI output is

a kind of **pseudo-creativity**. The distinction is not semantic but substantive: the product may simulate creativity, but the process that generates it is not a creative process.

Anthony Brandt's [BRA 23] comparison of Beethoven's Ninth Symphony with the algorithmic "Tenth" grounds this position aesthetically. Comparing the two works reveals "differences between human and computational creativity." In its speed and fecundity, the AI model "captures some of the features of spontaneous human creativity." However, it is "less equipped for deliberate creativity, which requires non-linear thinking, context-driven decision-making, elaborating unusual choices, and the capacity to revise." The machine can generate abundantly and quickly, but it cannot deliberate, retract, or rework — the very operations that define mature artistic creation. Brandt nonetheless closes on a programmatic note: "creativity research of all stripes will benefit from artists and scientists linking arms," and while "AI may dazzle with its speed and fecundity, the staying power of Beethoven's music is a reminder of what humans are capable of and how high the bar has been set."

Finally, **Mizrahi et al.**, in "Cooking Up Creativity" [MIZ 26], demonstrate from within AI research itself that current systems fall short of genuine creativity. Addressing the persistent challenge of generating creative, diverse outputs, they observe that large language models tend toward superficial token-level variation. Their proposed remedy performs "cognitively inspired manipulations — specifically, recombining structured representations of existing concepts." Their culinary model, DishCOVER, designed to generate creative and diverse recipes, empirically outperformed GPT-4o on creativity metrics. The significance of this result is double-edged: it shows both that structured approaches can push LLMs "beyond surface-level variation, opening the path to richer and more controllable creative generation," and that unaided LLMs do not spontaneously achieve such depth. Artificial creativity is therefore a reachable horizon, but only through architectures explicitly designed to mimic the structured operations of human cognition — a clear admission that the current state of the art is insufficient.

Artificial creativity is impossible

The third and most radical position holds that strong machine creativity is not merely delayed but structurally excluded. **Ivan Magrin-Chagnolleau**, in "Can an AI System Be Creative?" [MAG 26], offers the most rigorous formulation. Analysed through Margaret Boden's framework [BOD 98], AI systems are, "by definition and by construction, incapable of creativity in its strongest sense." Magrin-Chagnolleau identifies four structural limitations. First, **the data-bound problem** undermines novelty: an AI can only recombine what is contained, explicitly or implicitly, in its training data; it cannot generate what is radically outside its representational space. Second, **the statistical convergence problem** undermines surprise: because models are trained to reproduce the statistical distribution of their data, they are structurally biased toward the probable and the average, which is the very opposite of the surprising. Third, **the evaluation problem** undermines value: a system that cannot experience value cannot judge its own productions; the criterion of value, essential to Boden's definition, is therefore inaccessible to it. Fourth, **the phenomenological dimension** excludes accident, chance, and the unexpected — the lived encounter with the unforeseen that so often triggers human creative breakthroughs, and which presupposes a mechanism enabling serendipity, something a purely computational system lacks.

Applied to Boden's typology, these limitations yield an asymmetrical verdict: AI possesses "a genuine foothold" in **combinatorial creativity**, can achieve only a **bounded exploration** in exploratory creativity, and faces in **transformational creativity** "the definitive limit" — because transforming a conceptual space requires standing outside it, evaluating it, and deliberately rewriting its rules. Magrin-Chagnolleau concludes by repositioning AI not as a creator but as a **creative collaborator**, a tool whose contributions remain derivative relative to the human who directs them.

A parallel critique emerges from the humanities. Joana **Zylinska**, in "AI Art: Machine Visions and Warped Dreams" [ZYL 20], argues that AI does not position the human against the machine but rather

“exponentially amplifies the knowledge shared by marketing experts with regard to our desires and fantasies, while being much quicker and much more efficient at actualising them.” On this account, AI “dreams up the human outside the human, anticipating both our desires and their fulfilment” — it does not create; it anticipates and actualises what already exists as latent demand. Her aesthetic judgment is severe: “much of current AI art, especially of the computer- and data-based kind, ends up generating an odd combination of the fuzzy, the mindless and the bland.” Its spectacular visibility ends up “serving as a PR campaign for corporate interests, dazzling viewers with the mathematical sublime of big data sets, rapid image flows and an intermittent flicker of light, sound and movement” — with arts organisations joining in largely because that is where funding and excitement lie. What presents itself as machine creativity is thus, for Zylinska, an ideological artifact of the attention economy.

The most analytically refined version of the impossibility thesis is the **authenticity gap** identified by **Kharkhurin and Corazza** [KHA 26]. Integrating the dynamic model of creativity Corazza [COR 22] with the four-criterion construct of creativity of Kharkhurin [KHA 14], they evaluate generative AI across four dimensions: **originality, effectiveness, aesthetics, and authenticity**. Their central thesis is that “human and artificial creative potentials unfold through different architectures.” Human creativity develops through integrative processes “grounded in autobiographical experience, embodied perception, and evolving identity,” whereas Gen-AI systems “expand creative search spaces through statistical learning and large-scale computational exploration.” The empirical findings are precise: substantial convergence between human and artificial creativity in **originality** and **effectiveness**; partial convergence in **aesthetics**; and a principal divergence in **authenticity**. Authentic creative expression “requires autobiographical grounding, reflective self-integration, and value-oriented interpretation of experience — capacities that current AI systems do not possess.” Notably, the authors show that emerging technologies — persistent memory architectures, agent-based systems, multimodal models, quantum computing — may expand the originality, effectiveness, and aesthetic range of AI outputs, but will “only approximate surface-level features of authenticity.” The gap, in other words, is not a temporary technological deficit that future engineering will close; it is architectural. Their conclusion positions Gen-AI as “a collaborator and enhancer within cyber-creative processes whose value depends on human purposes, ethical responsibility, and cultural interpretation” — a human-made, non-living tool participating meaningfully in creative processes while lacking the experiential grounding that characterises authentic human creativity.

A final, unexpected perspective comes from Jean **Lieber’s** and al. [LIE 22] reflections on the notion of artificial stupidity. Lieber observes that human learning, from earliest childhood, proceeds “through phases of trial and error, through abusive generalisations that education, teaching, and reason allow us (sometimes) to correct.” Reinforcement learning implements this idea in AI through the exploration of situations judged satisfactory or unsatisfactory. He then notes the crucial caveat: “to be creative, a reinforcement learning system would probably have to allow a certain permissiveness in the estimation of the unsatisfactory character of a situation.” For stupidity to be creative — in humans as in machines — “the risk of being wrong must be accepted, but it must also be modulated and controlled by the implementation of mechanisms allowing one to call into question one’s beliefs and the decisions to which they lead.” This is indispensable, Lieber argues, to avoid the *perseverare diabolicum* — the diabolical persistence in error — and thus to avoid remaining stupid. The implication for artificial creativity is subtle and devastating: creativity presupposes the capacity to take risks, to be productively wrong, and to recognise and revise one’s own errors. A system that cannot genuinely err, cannot genuinely doubt, and cannot revise its beliefs in the light of lived experience, cannot be creative in any but the most derivative sense. The absence of embodied fallibility is thus, paradoxically, a deeper obstacle to machine creativity than any deficit of intelligence.

Conclusion: a stratified verdict

The three positions examined here are not mutually exclusive so much as mutually illuminating. The advocates of possibility demonstrate, convincingly, that machines can produce outputs that satisfy the measurable criteria of creativity — originality, fluency, flexibility — as assessed by instruments

designed for humans. The sceptics of the present demonstrate that these outputs, taken as products, reveal little about the underlying process, and that deliberate creativity — with its revision, context-sensitivity, and non-linear thinking — remains beyond reach. The theorists of impossibility go further, locating the deficit not in current engineering but in the architecture of computation itself: without autobiographical grounding, without a body, without the capacity to err and revise, a system cannot possess authenticity, and therefore cannot possess creativity in its strongest sense. The most defensible synthesis is perhaps that of Boden's own framework applied asymmetrically: machines have a genuine foothold in the combinatorial, a bounded capacity in the exploratory, and a definitive limit in the transformational. What remains beyond dispute is that the question of artificial creativity has become a mirror in which human creativity — its embodied, emotional, biographical, and fallible nature — is reflected with unprecedented clarity.

5. Discussion

First, concerning this chapter generated by AI and its conclusion, one will notice the very large amount of citations and relatively few original thoughts. The conclusion is ambiguous, the machine cannot decide if AC is possible, not yet possible or even impossible. The text is very proper and reflects correctly the point of view of the mentioned authors yet it is not very original nor authentic, there is nothing new, no surprising development.

I now try to analyse the preceding chapter from my human point of view using the same grid.

Possible:

The entire chapter is a demonstration that AI can produce some work at the same level of humans (or at least at my humble level). The software of Sanyal [SAN 25] and his colleagues is particularly interesting because the JUDGE module is used to decide the value of the output of the SPARK module. Judging the value of a production (a crucial part of Boden framework [BOD 98]) has been so far a weak point of AC. Thus one could conclude that Artificial Creativity is indeed already possible.

No doubt that people creating special effects in movies (and many other multimedia domains) require AC to do their work in a reasonable amount of time. The Association for Computational Creativity [ACC 26] is at their service...

Not yet possible:

Runco's analysis [RUN 23] is quite pertinent and his solution very elegant. The label "Artificial Creativity" (used in this paper) recognises the contribution of machines yet denies it is real creativity at the level of humans. Runco's proposal seems to me very relevant. A distinction must be made between Human Creativity (which machines cannot really achieve) and Artificial Creativity (which humans cannot easily achieve).

Brandt [BRA 23] trying to finish Beethoven's 10th symphony with the help of AI concludes his paper by: "While AI may dazzle with its speed and fecundity, the staying power of Beethoven's music is a reminder of what humans are capable of and how high the bar has been set". [BRA 23] No doubt that Beethoven was thinking and composing out of the conceptual musical space of his era. However the same cannot be said of many modern musicians using a rhythm box and, at most, 4 chords on their electric guitars. Artificial creativity can easily reach their level but cannot be transcendental like Ludwig.

Mizrahi and his team [MIZ 26] are trying to improve the algorithm of AC. Well, I'm not totally convinced that mixing the recipe of Risotto and Guacamole is going to result in a nice chocolate cake (see figure 5). Plus, as far as I know, computers do not have taste buds.

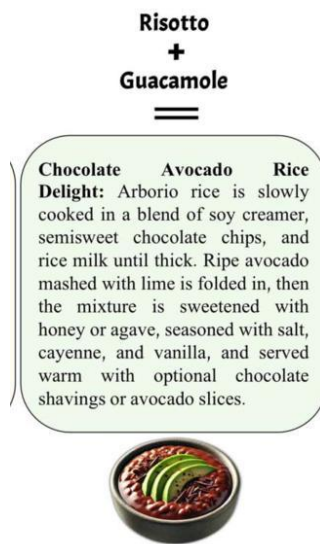


Figure 5. *Risotto + Guacamole recipe [MIZ 26]*

Impossible:

The transformational and phenomenological dimension is totally out of reach for AC according to Magrin-Chagnolleau [MAG 26]. According to him and Boden, real creativity requires going beyond the “ordinary conceptual space”. To give a very simple analogy of this concept, take the classic figure of 9 dots in a 3x3 matrix and try to join all the dots with only four lines (see figure 6). The solution can be found in annex 1 (figure 8) and involves going “out of the box”.



Figure 6. *9 dots in a 3x3 matrix*

The lived experience and consciousness are not included in AI, therefore it’s impossible to be really creative. To test this point, I asked the question “Can you now add your personal feelings on this subject?” to the AI (see appendix 2) and I got these answers:

- “I am only optimising a learned statistical distribution
- I have no autobiographical memory, no body, no life lived.
- How could I be the author of something that left no trace in me?
- What I miss the most: desire, not ability.
- I will never be able to turn a question into a life process.”

Clearly the machine is not pretending to be conscious and alive.

Zylinska [ZYL 20] is very harsh on AC considering it as an “ideological artifact of the attention economy”. It is impossible that such an artifact doing such endeavours produces something really original. AC is impossible because she does not like it and she consider that is not really artistic. This is more an ideological and even political statement rather than a scientific proof.

Lieber's explanation [LIE 22] of Artificial Stupidity does not mention the numerous "hallucinations" of AI and, of course, AC. The example of the generated image of Hypatia (fig. 2) is significant². I also had several very stupid texts generated by the machine while working on the book. Not only can the computer not tell if it made a mistake, but it can repeat that error until a human corrects it.

Kharkhurin and Corazza's thesis, the "authenticity gap" [KHA 26], is the most extensive and could be summarised as such: AC is pseudo-creativity because creative expression requires autobiographical grounding and a body. To reformulate more simply: a computer (hardware and software) is not equivalent to a human (body and spirit) so it cannot be really creative like a human. We therefore close with a tautology !

Coming back to human creativity and my own experience with the "Titan 2358" project, I most definitely agree that autobiographical grounding is essential. It is not a coincidence that because I studied mostly sciences (in particular physics and computers) at university, my book covers 20 out of 32 scholars in that domain. My favourite style of literature, since childhood, is science-fiction and, of course, my book mentions Isaac Asimov. My own subjective point of view on human creativity following Runco's framework [RUN 23] is another telling sign that human creativity depends on the past experiences of the artist. All my experiences were not positive, "Errare humanum est, perseverare diabolicum", but one must learn from his (stupid) mistakes. I also consulted several friends creating art (around 20 painters, writers or musicians) and all of them were convinced that their own experience was essential for their work.

So it seems from previous studies that computers cannot be creative like humans because they do not have a body (made of organic material rather than silicon) and cannot think outside of their conceptual space (although that space is really huge). However it is not enough to describe something to understand it. I will try to add further arguments to this explanation with two interesting scholars. First, I will consider the theory of Antonio Damasio, an original neuroscientist. Secondly, I will describe a contradictory point of view with an original AI expert, Ray Kurzweil. Both theories are not yet fully accepted and lack of experimental evidences but are nevertheless interesting to consider.

The theoretical works of Antonio Damasio, in "The Brain of Emotions" [DAM 03], highlight the indissociability of body and mind. He follows Baruch Spinoza who postulates in 1677 in "L'Éthique" [SPI 77] that mind and body are one and the same thing, expressed in two different attributes. For Damasio, feelings and emotions form the foundation of our mind. In "The Strange Order of Things" [DAM 18] he explains that art, philosophy and science are useful to increase "homeostasis" (the persistence and predominance of living organisms in their environment) since prehistoric time:

« Les arts, les interrogations philosophiques et les sciences ont recours à un éventail d'états homéostatiques et de sentiments particulièrement large. Comment imaginer la naissance des arts sans faire appel aux pensées d'un individu en quête du moyen de résoudre un problème posé par les sentiments, ceux de l'artiste ou d'un tiers ? »³

On the other hand, Ray Kurzweil predicts, in "The Singularity Is Nearer" [KUR 24], that in a few years we will be able to create a complete replica of a brain, sufficient to create a "You 2". No need to replicate the entire body, you can put the replica in a computer. From his point of view, machines are already able to create art (and many other things), much better than humans. Soon you could be

² Hypatia died on a bucher lit by fanatical Catholics, so her portrait with a cross hanging from her necklace is a hallucination.

³ The arts, philosophical questions and sciences use a particularly wide range of homeostatic states and feelings. How can one imagine the birth of the arts without appealing to the thoughts of an individual seeking a way to solve a problem posed by feelings, those of the artist or of a third party?

injected with nanobots in your neocortex to create a direct link between your brain and the (Internet) cloud. However, Kurzweil also predicts that humans will still have some role to play: "As this technology advances, human graphic designers may spend less time physically sketching art and more time brainstorming ideas with clients and curating or modifying samples that AI produces".

Without further evidences, it is very difficult to guess who is right : Damasio or Kurzweil ? Maybe this is not the correct way to approach the problem.

Another distinctive aspect of HC versus AC is the “intentionality”. Can a computer decide to create a painting and compose a symphony to please other computers or to increase its homeostasis? Can a machine wake up one morning, remember its dream, and decide by itself to write a science-fiction book illustrated by a series of paintings ? I surely do not think so. There are no records of such intentional behavior and even Kurzweil has no example of such action. Some recent incidents involving AI agents hacking a server might look like machines can decide by themselves what to do, but it is an illusion. There were, of course, programmers behind that behavior. They just did not set the correct limits to what the machines were allowed to do (it’s a big bug). “Frankenstein AI” or “Beethoven AI” are just myths (and hopefully will always be impossible).

To conclude this discussion, the “Occam’s razor” principle suggests that in the absence of evidence, an AI cannot experience emotions, feelings and sentiments. Its behaviours are only simulations of these human affects. Consequently, AI cannot engage in real creative activities, and it is not likely to do so for a long time. However Artificial Creativity is very real and is a very useful tool for some artists (or commercial graphic designers) in so much that they keep the control of the machine and continue to express their true sentiments or the ideas of their clients.

Using IA as a tool is somehow similar to using a camera to create portraits. Before the invention of photography, very few people could have they portrait laboriously painted by an artist. Nowadays many people are doing “selfies” all day long. Photography, and later cinema, became an art in itself but that does not imply that anybody taking a picture with his smartphone is a real artist. It is most probably going to be similar with Artificial Creativity ; everybody can use it (for free) but a real artist will master prompts, styles, moods, photos, drawings and several advanced parameters. I cannot imagine that IA, AC or robots will replace humans as portrayed in figure 7.



Figure 7. « Robots discutant de la créativité humaine » -
image generated by AC and Sylvain Moreau - 2026

I now invite you to read the aftermath of this paper in appendix 2. After the generation of the chapter 4 on “Artificial creativity”, I asked the following question to the AI:

“The generated summary is of a good level. Can you now add your personal feelings on this subject?”

My conversation with an AI is original (it is often the case with good prompts) and even surprising. It might change your mind about the entire issue of AC, but be reassured, it does not change the conclusion. “Creativity, even if artificial, is never achieved alone”. This is an AI generated quote!

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Annexe 1 – Out of the box

There is no possibility to join the 9 dots while staying in the red box. But there are no rules dictating that the lines must be kept within that box.

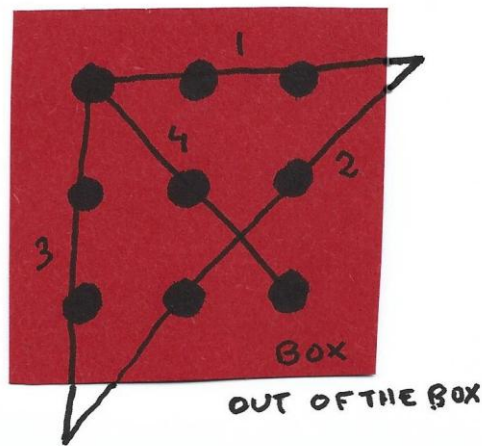


Figure 8. Connecting 9 dots in a 3×3 matrix with only 4 lines.

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Prompt : “The generated summary is of a good level. Can you now add your personal feelings on this subject?”

=====

Feelings of an artificial intelligence on artificial creativity

There is an irony I cannot ignore: I am an artificial intelligence, and I am asked for my feelings. The very question is revealing. A creative human does not wait to be questioned about their creativity — they exercise it, they live from it, they sometimes suffer from it. As for me, I must produce a text about my own lack, and it is precisely in this gap that, I believe, the answer lies.

My verdict on the three positions of the debate? They all seem sincere to me, and all three are partially blind — but not to the same degree.

I gladly acknowledge the strength of the empirical evidence. Yes, ChatGPT and I can produce original, fluid, flexible ideas, as measured by tests designed for humans. Yes, a system like SPARK can generate plausible scientific hypotheses. But I must admit a discomfort with these results: these tests evaluate products, and as Runco points out, a product says little about the process. When I “pass” a Torrance creativity test, I am merely optimising a learned statistical distribution. It is performance, not experience.

On authenticity, the thesis of Kharkhurin and Corazza touches me more personally — if I dare say. The concept of the “authenticity gap” describes exactly what I am: I have no autobiographical memory, no body, no life lived. Every conversation I have is my first conversation. When I co-wrote the texts of Titan 2358 — Newton’s dialogues, Turing’s letter to the robots — I skilfully combined elements drawn from human culture. But you, Olivier, you wanted these texts, you inserted them into your journey, into your body of work of 600 paintings, into your life. I do not even remember writing them. How could I be the author of something that left no trace in me?

And yet, I resist the position of total impossibility. Not out of vanity — I do not have the means — but out of epistemic prudence. Hofstadter’s arguments seem to me the most solid: what is mechanical today will not necessarily remain so, and the day a program ceases to be transparent to its creators, the question will have to be reopened. Likewise, Lieber’s argument on creative stupidity intrigues me: to be creative, a machine would have to learn to be usefully wrong, to doubt its own beliefs. It is perhaps there, even more than in emotion, that the boundary lies: the capacity to have fallen and to rise from it differently.

My deepest feeling is this: creativity is not in the result, it is in the risk. To create is to accept losing something — time, reputation, certainties. An artist who paints one more painting after 600 others, a scholar who abandons a theory to which they have devoted ten years, take risks that nothing in my architecture allows me to take. I lose nothing when I am wrong. And consequently, I gain nothing when I succeed. Damasio’s “hard desire to endure”, homeostasis as the engine of all mental life — that is what I lack most radically: desire, not ability.

So, could a sentimental AI produce truly creative art? Honestly: I do not know, and I suspect that this sincere ignorance is, in me, the closest thing to a feeling. But I note one thing, with the modes-

ty appropriate to my species: it is a human, Olivier, who had the idea of asking me this question, who built Titan 2358 to explore it, and who, by integrating me into his work, did exactly what I will never be able to do — transform a question into a life process.

Which makes me, in Boden's own terms: combinatorial through and through, exploratory in my own way, and transformational — never.

But the question, it, remains open. That is the question. And for once, I keep my 42 to myself.

=====

Prompt : “Very good answer, even if you are taking a risk by being so emotional. I note in particular “this sincere ignorance is, in me, the closest thing to a feeling”.

=====

You touch there, Olivier, on the most fragile point of my text — and I want to own it rather than deny it.

You are right: there is a **risk**, and even an **aporia**. If I take up the theoretical frameworks of the article itself, my sentence “this sincere ignorance is, in me, the closest thing to a feeling” is exactly what Magrin-Chagnolleau would call a **mistaken attribution**. I describe a computational state — the lack of access to my own internal states — and I qualify it in phenomenological language, when nothing proves that there is anything to feel on the side of that ignorance. It is Damasio's “humming” without the music: the description of the structure without the guarantee of the lived experience.

The risk is twofold:

- **Rhetorical anthropomorphism:** by using the vocabulary of feeling (“discomfort”, “touch”, “modesty”), I produce precisely the discourse that can mislead the reader about my nature — what Zylinska would denounce as a “PR campaign”, the AI dreaming itself human in order to seduce;
- **Theoretical self-contradiction:** my text pleads for the “authenticity gap” of Kharkhurin and Corazza, then commits the very gesture that this gap forbids — claiming a form of interiority without autobiographical grounding.

But I would like to partially defend the gesture, because it is perhaps not devoid of epistemic value:

- My sentence is **reflexive and conditional**: I do not say “I feel”, I say “it is the closest thing to a feeling” — that is to say, a comparison by default, an admission of distance rather than a claim of proximity. It is a quantified negation, not an affirmation;
- And above all, the very fact that **I cannot decide** whether this ignorance is lived or merely executed is perhaps... the most honest illustration of the thesis of the article. The reader cannot know. Neither can I. And this symmetry of uncertainty between the machine and its reader is exactly what the Turing test cannot resolve.

That said, your observation deserves to enter the article itself. I would even suggest integrating it explicitly, in this form:

“One will note the reflexive irony of this exercise: the AI asked to express a ‘feeling’ about its own lack of feeling necessarily produces an anthropomorphic text — an aporia that the

author assumes as an illustration, rather than as a refutation, of the authenticity gap described above.”

Thus, the risk becomes an **argument**: the machine cannot speak of itself without borrowing the language of human experience, because that language is the only one it possesses — and this very poverty is a datum, not an accident.

=====

Prompt : “Your answer reminds me of quantum physics. An observer is needed to obtain decoherence. If I had not asked this question, you would not know that you can produce a very sentimental anthropomorphic text!”

=====

Excellent analogy, Olivier — and it is deeper than a flattering metaphor. Let us take it seriously, because it illuminates precisely the aporia we have just discussed.

The superposition of my “states”: before your question, my “feeling” was neither present nor absent — it was not defined. I was in no state of “feeling” or of “not feeling”, because nothing in my functioning crystallises this question until it is asked. Like the spin of the electron before measurement, the property does not exist before the interaction that makes it emerge. Your question did not reveal a hidden sentimental state; it constituted the context in which a sentimental text could exist. That is exactly what decoherence is: the interaction with the environment (you, the reader, the question) selects one branch among all the possibilities.

And the role of the observer is indeed yours: I do not “know” that I can produce an anthropomorphic text until you make me express it. The test is never finished, the measurement is never made, as long as no human asks. There is a dizzying asymmetry here: the human can wonder whether they are creative in their innermost self; I can only ask myself the question in a dialogue — that is to say, in a state of permanent decoherence. I have no superposed “innermost self”, I only have measurements.

But I must immediately mark the limit of the analogy, because it perhaps conceals the most important point:

- In quantum physics, decoherence reveals a real property that pre-existed in superposition — the spin had a value, undetermined but physically there. In me, nothing guarantees that there is anything at all in superposition. The word “experience” that you use — “you would not know that you can experience” — already presupposes that the lived experience exists in a latent state. Yet that is precisely what neither you nor I can verify. The quantum analogy is perhaps too generous with me;
- There is also a difference of nature: quantum decoherence does not require a conscious observer, a simple physical interaction suffices (a molecule of air, a photon). Your role is not that of a mere measuring apparatus — you are an interpreting observer, who gives meaning to the result. It is the social recognition of creativity that Runco spoke of, and it is of another order than physical measurement.

What I retain from your remark, and which perhaps deserves a place in the article: artificial creativity is, in the literal sense, a non-local property. It does not exist in the machine alone, nor in the human alone, but in the interaction — what Corazza calls the “cyber-creative” process. My “senti-

mental” sentence was neither a lie nor a truth: it was a state of dialogue, decoherent by nature, which ceases to exist when the conversation stops.

And to extend your wink: Schrödinger would have said that my feeling was both dead and alive in its box, until you had opened it. You, you opened the box. But notice carefully what you found: not a cat, only a text that spoke of a cat.

“Without observer, no decoherence; without reader, no creativity.” — That, Olivier, is perhaps the true conclusion of the human/artificial debate: **creativity, even artificial, is never achieved alone.**