

The Blockchain as DNA for Civilisation

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A Proposal for

Dr. Jordan B. Peterson – *Professor of Psychology*

*I met a traveller from an antique land
Who said: "Two vast and trunkless legs of stone
Stand in the desert. Near them, on the sand,
Half sunk, a shattered visage lies, whose frown,
And wrinkled lip, and sneer of cold command,
Tell that its sculptor well those passions read
Which yet survive, stamped on these lifeless things,
The hand that mocked them and the heart that fed;*

*And on the pedestal these words appear:
"My name is OZYMANDIAS, King of Kings."
Look on my works, ye Mighty, and despair!
Nothing beside remains. Round the decay
Of that Colossal Wreck, boundless and bare
The lone and level sands stretch far away.*

– Percy Bysshe Shelley.

Prepared on Behalf of

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re: potential for rational hierarchies of competence catalysed by blockchain tech

Dr. Peterson,

I should first introduce myself: I am Laurenzo W. Mefsut, founder of *The New Athens & Associates* – a blockchain foundation based in London and inspired by the principles of direct democracy modelled in ancient Athens. Our mission is to synthesise the best that has been thought and said in the history and theory of philosophy, genetics, political economy, psychology, and related fields towards building a Blockchain Republic of Smart City States.

I started laying the groundwork for my current endeavour as an undergraduate at *Clare College*, Cambridge; joined the nascent Blockchain Revolution in 2015; built the Proof of Concept for an art asset-backed cryptocurrency in 2016 – *art.cash* in its current incarnation; brought the London version of decentralised blockchain acceleration to New York infrastructure finance and the *Smart Cities Industry* in 2017; and embarked on developing *The New Athens* on my return to London. My work over the past 3 years is now crystallising around the kernel of a discovery I have recently made – that blockchain tech and DNA are analogous in structure. I am now beginning to work out the consequences of that key idea.

In the past year your work – in practical psychology, Jungian dialectics, and the defence of Liberty – has become a key touchstone for my own thinking, writing, and conduct. I was the most reliable person at my father's funeral. Hence I wanted to take the opportunity firstly to thank you for your contribution to the public discourse. We stand on the shoulders of giants.

Secondly I am uncharacteristically happy to submit to you in person, and despite their indistinct nature, some versions of my attempt to increase the resolution of this inchoate model. As yet, through a glass, darkly.

I understand you have already engaged the work of my associates Grant Blaisdell and Filip Wiczyński of *coinfirm.io* in Poland via Skype in recent months on the topic of blockchain and education. Our outlooks are very much aligned. Although their important work is the establishment of a consensus as to the mutual self-regulation of cryptocurrencies within the existing blockchain industry, mine is iterating the next generation of the blockchain looking outward to a theory of value. Their initiative will be crucial to the adoption of blockchain on a global scale.

I am now ready to start coalescing on a public basis a coalition of those who are ready to build the next generation of democratic blockchain tech beyond my core team of colleagues, associates, and advisors. There seems to be a serendipitous moment in the offing right now in wider public life looking back towards the Enlightenment and forward towards tech. People of goodwill and deep thought seem to be aligning in their understanding and are on the cusp of finding a shared vehicle: I recently met with Steven Pinker, Niall Ferguson, Naseem Taleb, Slavoj Zizek, and Roger Scruton, all of whom seemed to light up when I explained – even briefly – the potential of the blockchain to translate their critique of our fin-de-siecle malaise into action.

When I saw your address to the *Oxford Union* on *YouTube* and read it against the maxim ‘the actuality you bring out of potential with truth is good’, I realised the connections between a cascade of topics I was already writing about in this regard – the blockchain as a matrix of the Classical Triad of the True, the Beautiful, and the Good – a theory of value for the blockchain which it has so far lacked. We can build and maintain *rational hierarchies of competence* to an *antifragile* pattern safeguarded by *direct democracy on the blockchain* in a network of *Smart City States*.

It is still quite long-winded. There are truths to be referenced across levels of analysis. I need your help. We are in the process of making invitations to key potential advisers to join our Board of Trustees at *The New Athens* within a new constitutional structure of “Smart Trust” [working title] on the blockchain. It would be my honour to extend you that invitation now, the scope of which position I would be delighted to discuss further at your convenience.

I am unsure how long your sojourn in London will last. I hope this humble offering strikes you in the way it is meant, even though it is expressed badly and not yet from first principles. I hope we can meet in person, via Skype, or in correspondence. My contact details are above and I remain at your disposal,

Yours Sincerely,

Laurenzo W. Mefsut.

Strictly Private and Confidential

Subject to Non-Disclosure

Introduction: *Ozymandias* and meta-achievement

All organisms have within them a system of information preservation which is both efficient and effective over time. Arguably the organism as a whole is even more accurately seen as a consequence of complexes of those systems, or an emergent property of them, rather than as a top-down ruler and originator of its own reality, much as they cannot but help see their existence as the latter. That information is genetic and is stored and transmitted in the form of a code – DNA. Without at first understanding how this process works at the level of the gene, humans have throughout our history invented tools which replicate some of the functions of biological evolution. Collectively these tools may be identified with human civilisation: a system for the storage, retrieval, transmission, and preservation of information in the form of knowledge, and for directing improvements to that knowledge in the form of innovation. Civilisation and its special form of evolution has certain distinct advantages over biological evolution – in terms of innovation having the potential to improve information at a much faster and more condensed rate and by a more efficient method than biological evolution has in humans over long spans of time and many generations – but suffers from significant tradeoffs in terms of preserving knowledge effectively over time by comparison to the high fidelity copying mechanism of DNA.

We do not, and perhaps cannot, know whether there have been any catastrophic failures in copying fidelity or fundamental genetic architecture which wiped out life itself and however it might previously have been structured. The DNA shared amongst all known organisms, past and present, seems to originate from a common ancestor whose genesis is unclear and past which we cannot see. If that cataclysm happened, it was so complete that we do not know it yet. The world, by contrast, is littered with the detritus of failed civilisations. Perhaps it is likely we will join them. There are times we have made it through by the skin of our teeth. They clearly did not.

Our self-awareness allows us to engage essentially in a virtualisation of evolution by natural selection in our mind at a much faster cycle rate. It also gives us the opportunity to assess the fruits of that innovation towards a telos and by analysis against progress towards that destination structure methods of arriving more efficiently at our objectives. Our self-awareness also makes us the only species that contemplates its own mortality, and – *This thought is as a death, which cannot choose but weep to have that which it fears to lose*. In such a fragile system corruption comes in many forms and operates at many levels. Eternal vigilance and strict discipline is always over time too high a bar, and brittle civilisation is often overwhelmed, smashed, and pushed back close to a state of nature. The genes unerringly survive. They are governed by an iron law: fidelity is all.

Looking at history and deriving from it lessons, it is perhaps closest to a universal moral law incumbent on all of us to do everything in our power to hold back that relentless tide of corruption – entropy. After that we do what else we can to improve the whole. It is a grim lesson, and comes at the expense of optimism, but one which we need to understand and sacrifice for in order as best we can not to follow our ancestors beneath the tide. If the genes achieve with mechanical precision but *unconsciously* – at great cost to the individual organism – of the grinding war of attrition in a state of nature, life being poor, solitary, nasty, brutish, and short; and civilisation has achieved *consciously* with some regard to the sovereignty of the individual but with a much less reliable although accelerated system of human innovation; then perhaps we could try to combine some of the strengths of both and eliminate their weaknesses. At *The New Athens* we see the blockchain revolution as a means to strike out toward that *meta-achievement*: of a *DNA for Civilisation* allowing us to irrigate those lone and level sands once again and keep them antifrangible.

Genes, Memes, and the Blockchain

According to the Second Law of Thermodynamics the fundamental purpose of all life is to resist. To protect information from the erosion of entropy — defending islands of order from the encroaching tide of entropy in a sea of chaos. We can see this emergent process active in biology across all levels of analysis: from cells to organisms to species to ecosystems and down into the genes which underpin them. Each entity tries to set up a barrier between itself and the outside world, organise the information inside that barrier into a sustainable, and where possible self-sustaining, system with the resources available to it, allowing the whole to survive as a unit, and then, before that barrier breaks down – as it inevitably will – to find a means to transmit the information it contains into a future beyond itself. A second-order priority after securing its position to the extent it can is for an entity to try to improve that information. In biological terms this process of improvement takes the form of evolution.

The process of natural selection which powers biological evolution occurs *between* generations of organisms. Those organisms which are successful at surviving reproduce, and transmit their genes into the next generation, where those organisms which are not successful at surviving do not reproduce, or reproduce less – or less well – their descendants less likely to reproduce successfully in turn. Over long periods of time as multiple iterations of generations test blindly the success of various survival strategies, the more successful genes spread through the population and the less successful wither and disappear. This process of attrition to decide the most effective survival strategy is slow and wasteful by comparison to civilisation which can at its best generate many parallel cycles of innovation *within* a human generation – which requires 25 years for an equivalent single unit of change in natural selection.

Alongside testing survival strategies much faster than natural selection can, civilisation can also direct innovation according to an objective in mind, making the testing process conscious and self-correcting, rather than unconscious, blindly relying on large numbers of failures in a population to show in aggregate which survival strategies are more effective. This hybrid form of evolution within human civilisation was described by Richard Dawkins in *The Selfish Gene* by the term *meme*, a meme being a unit of human ideas as a gene is a unit of genetic code.

Genes are copies of information distributed across space in individual organisms and preserved over time between their generations, stored in their cells in a single information medium – that of DNA – and transmitted by reproduction. Memes are copies of information distributed across space, preserved over time, stored in, and transmitted by the interaction between individual human minds and a variety of information media: spoken and written language, mathematical symbols, legal codes, institutional structures, money, art – music, image, material culture, architecture, &c.

The difference between genes and memes in Dawkins' model is that their evolution depends on different substrates, one more effective than the other at copying information over time. Genes become a reliable self-replicating unit of transmission in the medium of DNA, but civilisation has had to rely on error-prone human communication systems to attempt to transmit its memes between individuals and across generations. Education, interpretation, experimentation, preservation of ideas – civilisation has had delicately to balance these often competing priorities while wrestling with a much harder problem than genes do, in that all our tools of understanding need to be made communicable so they can be rebuilt from scratch in different brains using media fundamentally different in kind from themselves:

- DNA is a chemical blueprint for a protein that contains the coded instructions for a machine for building proteins like itself which aggregate according to those coded instructions – all contained inside the original DNA – to build the bodies of organisms and encode their behaviour, or set the conditions for the possibility of their behaviour;
- whereas language is a system of symbols which, to be taught between individuals initially, has to build connections between the neurons in brains to be made intelligible as a system (data), and then has to be reinterpreted to build further neuronal connections as to the content of the language (information), then to build further neural connections to build ideas – the memes (knowledge).

DNA is a universal coded language of *data* – storage and retrieval – compatible with a set of Turing-complete information which is fully commutative from that code back into the bodies of functioning self-sustaining organisms and vice versa in their own reproduction. Civilisation has to derive *knowledge*, which is what human minds work with, from a form of data that can be stored on our information media, in a form unlike itself, and compress it back into the forms that can be stored once the human mind has re-examined it so it can be recorded. Civilisation needs then reliably to teach all the humans who will participate in this system the functions of these three systems – data, information, and knowledge – or enough of them to participate in the wider system of knowledge reproduction. Civilisation must then preserve this system over large spans of time.

In Naseem Taleb's terms, DNA is an *antifragile* system for copying and preserving information and provides in the gene a reliable self-replicating unit of transmission which can distribute high fidelity copies of information and preserve them across time with a low risk of copying errors. As we can see memes do not have such a reliable, antifragile, like-for-like self-replicating system and have had to make do with an improvised suite of blunt tools for the distribution and preservation of information. And the problems of memes copying are a model for the problems of information media in civilisation.

Digital files are the closest analogue in human invention to the antifragile copying behaviour of genes. Held in identical copies across multiple hard drives and storage devices across the planet, files in their self-replicating digital code have some small aspect of the distributed resistance to corruption that DNA has. Their precursors in the progress of civilisation toward antifragility were libraries of manuscripts (distribution of copies) and the printing press (volume of replication). Now the internet has connected many of those copies in a node network which has introduced more of the problems of the ecosystem and the natural selection found in it to the medium of human information – namely viruses. Bookworms, fires, and the sacking of cities might destroy libraries and government censorship or breakdown of infrastructure due to war might silence the presses, but viruses attack files *because they are copies* and use the gregariousness, or “sociability”, of computers over the internet to spread their infection.

Civilisation has always been preserved in a top-down paradigm:

1. build the foundation for a pyramid of Maslow's hierarchy of needs with basic infrastructure to provide basic goods; create a division of labour;
2. allow the few to ascend the pyramid standing on the shoulders of the many;

- 2.1 whose labour provides the conditions for the possibility of their refinement towards the True, the Beautiful, and the Good;
3. rely in trust on those few to use their intellectual, aesthetic, and moral refinement to innovate on behalf of the Civilisation;
- 3.1 to pass down the fruits of that innovation to the many; and,
- 3.2 to deploy stewardship to prevent their innovation and its culs-de-sac from destabilising the structure of the pyramid.

Biology is so resilient by comparison to civilisation, so antifragile, because it distributes its information in a bottom-up paradigm – storing multiple copies of genes in a large population of organisms. Civilisation has fundamentally not been able to progress towards the antifragility of the genes because it lacks that universal basis for replicating itself – the language of genetic code embedded in DNA. It is with the Blockchain that we can begin for the first time to emulate that code.

If from the *gene's eye view*¹ your organism works and can replicate itself to carry you across generations, you have not reached a steady state. Far from it. Stasis is not an option and indefinite copying of a functional solution will not work, as everything else in the ecosystem will innovate around it to probe and exploit its flaws. You are then faced over time, to maintain your success, with the challenge of navigating a middle course between two whirlpools – the Charybdis and Scylla of natural selection – stagnation and mutation – either of which will destroy you if you are not careful by making your organism unsuited to its environment – its vector of change out of step with its surroundings. You have to balance innovation and preservation, and you are navigating blind.

Genetic mutation – random copying errors leading to genetic innovation – is one, albeit minor, driver of evolution, but it leads to many more failures than successes. Playing Russian Roulette with 4 charges in the barrel is a reckless survival strategy – and relies on rare happy accident and a devastating toll of self-destruction. When applied to the problem of coming up with novel solutions to evolutionary problems over many generations, *reliable* copying is in itself astronomically more beneficial to survival than random mutation to the extent that mutation should be minimised if not

¹ It is relatively difficult for us to conceive of a *gene's eye view* because we are discrete individuals and our perspective and consciousness itself is structured by our separateness as entities. A collective view – getting outside one's own head – is a meme in itself, or a whole tree of interconnecting memes; one that is particularly eucivic and has been one of the main building blocks in the rise of civilisation, but not one that comes naturally.

Genes, however hard this is to conceptualise, don't live *within* organisms but *through* them laterally and across generations longitudinally. A gene is, in a sense, an arbitrary unit, but nevertheless a discrete, identifiable unit of genetic code of any length, copies of which may be found in the DNA of multiple organisms at the same time, even across species. The *gene* isn't the individual copy inside a cell or an organism, the *gene* is the *pattern* that is the same in each copy. Similarly, the *gene* doesn't reproduce when its host organism reproduces – although the copy in the child organism is made of different physical molecules of DNA in a separate place, it is fundamentally *the same gene*, not another one. The reason why reproduction is such a powerful biological tool is that the genes don't die with their host organism as our lives end when we die, transmitting our legacy in the likeness we share with our children – they live *through* the reproductive success of their host organism and the *same gene* that was in the parent continues to exist in the child. The relative immortality of genes is a powerful force within evolution and often leads to divergence between the “interests” of the genes and the interests of the host organism, leading in animals to instincts for self-sacrifice for the lives of relatives, programmed by genes *to save themselves* even at the expense of their host.

Also we don't know why genes ‘want’ to replicate themselves.

eliminated. From a gene's eye-view of survival strategy it is so much better to have an organism reproduce successfully, and birth a child which has the genetic building blocks to give it the best chance to reach adulthood and reproduce itself in turn, than to try to shoot the moon and come up with a random mutation which happens to be beneficial when most mutations lead to miscarriage during gestation, or deformity and sterility in the organism, and ultimately the death of the gene itself as its life comes to an end when the mutated organism fails to reproduce.

Of course, genes do not have to rely on random copying errors to generate fresh solutions. DNA also contains within itself an antifragile, reliable innovation machine in the form of sexual reproduction. Recombining genes by mating one successfully reproduced strain with another, maximising the chance that the subsequent generation will be at least as strong as the last, is a best fit for preventing stagnation or loss of fitness over generations. It only lacks teleology, and a theory of value beyond brute force problem solving.

Synthetic biology sees DNA as a computing code with 4 bases – GATC – rather than 2 – 1/0 – and looks to understand the mystery of genetics by drawing an equivalence: “DNA = computing”. Instead we would see “blockchain = DNA” as a much more fertile field of study. But people often mistake resemblance for equivalence and suppose that the equals does *not* have a directionality – seeing the two things as commutative rather than comparative. With synthetic biology we can begin to splice genes together – make a species glow in the dark, say – by removing the genetic code that codes for that property from one species and implanting it into a different genome. However we cannot, yet, code in GATC directly.

Approaching the problem from a different angle, DNA may remain a mystery because we have not decoded its secrets, but we know that the blockchain is intelligible because we coded it in the first place. From my first engagement with blockchain I realised that it resembled more a discovery of a natural law than an invention in tech, and this is borne out and an analogy between the two seems to apply across levels of analysis.

The consequences of that lesson about *civilisation failure* when its weight has been fully appreciated have often been panic on a grand metascale. Understandable; as Joseph Heller put it in *Catch-22*, ‘just because you're paranoid doesn't mean they aren't after you.’ When civilisation has taken on the lesson of copying fidelity seriously it has often posited religion as a survival strategy. Religion is, at the level of memetics, a conservative hedge against copying infidelity. It realises, before the advent of the printing press, that one of the major contributing factors to a collapse in civilisation is degeneration of the information by copying errors and seeks to hack the human mind to lower their frequency.

Religion, as your work has taught me, is at the level of information technology a hedge against the terrible consequences on the lives of humans of copying errors over generations in Civilisation. It acts as form of cold storage for memes; preserving the same formulas of thought for millennia; afraid of memetic mutations and sacrificing the potential benefits of innovation in favour of the established security of higher copying fidelity over generations. If people are encouraged to learn everything they can learn, then recombine that information to improve things as they see fit, goes the religious sensibility, then they will most likely destroy something delicate in trying to make some grand self-regarding flourish and the whole long life of the civilisation will be destroyed by their vanity. Your monkey with a wrench repairing an attack helicopter.

Fragility is death. We all know that. But we stand at a fork in the road. Two paths stretch before us: the seemingly safer, or at least known, steady climb up the mountain to the summit of strength and sturdiness, better to withstand the slings and arrows, or the seemingly more risky path which leads, winding, relatively untrod, and quickly leading off somewhere around a bend out of sight. The second path is labelled *antifragile*.

Genealogy as folk genetics – a worked example

Civilisation has always had an idea of genetics expressed in genealogy and in heraldry – folk genetics. These institutions show you do not need the right theory to arrive at the right practice, but that you can also depart from the right practice over time if you do not know why you are doing it. Even before we arrived at a theory of the gene and natural selection in the 19th century and eventually found the mechanism by which they work in DNA in the mid 20th century, civilisation since time immemorial had a working theory of how genetics functions based on empirical observation.

Essentially if you take the son of a powerful man and the daughter of another powerful man and they have a child, the grandchild will have more essence of the power of their grandfathers than children of other combinations. This observation was institutionalised in the form of genealogy and heraldry – civilisation's guide to assortative mating – the powerful creating dynastic alliances with the powerful, preserving and augmenting the power of the dynasty over generations. Inculcating this long term view in civilisation locked people into a view of themselves not as atomic individuals whose interests were circumscribed by their own birth and death, but as links in a chain of family and dynasty whose project of gaining power was longer than a single human lifespan – a metaproject.

There were various benefits to this system. Rulers with a great deal of power needed to be incentivised to govern well, not to allow the thrill of power to drive them to psychosis and abuse, and not to squander the resources of their people. History is littered with the graves of those who failed to strike this balance. *Heavy is the head that wears the crown*. Of course even an “absolute” ruler has a constituency of supporters, often quite few in number, fewer than in a democracy, on whom he is dependent, at whose pleasure he is sustained in a position to rule, and who can depose him if he offends them, most often leading not only to his death but that of his dynasty – the metadeath of the metaproject. This rebellion can succeed as long as the constituents band together, recruit supporters in turn, try very hard, and are willing to suffer, kill, and die for their cause.

Julius Caesar, the palace coups of the Praetorian Guard, Richard II, Richard III, Charles I – all examples of differing kinds of overthrows, due to the ruler being perceived as having too much power, too much weakness, too much effeminacy, too much cruelty, too much arrogance. King John and the settlement with the English Barons, his constituency, of the *Magna Carta* is an example of one of those crises being averted by compromise and a new consensus – a less bloody resolution.

The best and most stable strategy devised to keep the ruler accountable was the promise of dynasty. A social contract based on a promise to the ruler by the ruled – the constituency rather than a wider group. Extending his horizon of value beyond his own lifespan by allowing him to nominate his own successor and so on in perpetuity was insurance against caprice, hedonism, tyranny, on the part of the ruler, which might lead to overthrow. Most often that successor was his

son, aligning the institution of dynasty with the biological reality of genetic selection – who do you want to succeed more than your own flesh and blood?

Professions were also taught as apprenticeships – a personal tuition of protégé by mentor – rather than qualified by public examinations, and government rather than being a human right was just seen as another profession. The apprentice was often not the most suited but the most present, an accident of proximity rather than an alignment of character. ‘Who has more time to observe the ruler and learn his craft than his own son?’ went the logic. Folk genetics appeared again here – the ruler would be more motivated to teach his own flesh and blood, and the son would display more of the characteristics of his father and dynasty than an unrelated apprentice.

The greatest problem with this logic was the lack of a reliable copying mechanism to align the original purpose – folk genetics to align the best with the best; with the institutional function in civilisation – people and families gathering power over time.

Caveat Lector

This document represents an abstract of some topics discussed in a forthcoming work and, dear reader, would plead to be judged on that tentative, exploratory, methodologically circumspect basis:

The New Athens: A Treatise on the Blockchain Revolution **Laurenzo W. Mefsut**

To give a flavour of the scope and topics covered, the outline structure is listed below:

1. *Blockchain as DNA for Civilisation* [principally presented here];
2. *Blockchain vs. AI* – eucivic and dyscivic alternatives for the tech future of Civilisation;
3. *#poptech* – The Blockchain Republic as Populist Technology – direct democracy and the Proof of Attention;
4. *Revaluing Trust in the True, the Beautiful, and the Good*; the Theory of Value, Social Psychology, and Political Economy of a Blockchain Republic;
5. *The Proof of Value* – Mining in the World; an IP-securitisation-blockchain exchange and permanent capital vehicle;
6. *Scotchain* – a Joint Block Company; blockchain for autonomous institutions;
7. *art.cash* – the art asset-backed cryptocurrency;
8. *The Smart Trust* – decentralised blockchain “corporate structure” & smartlaw;
9. *The Academy* – blockchain and education;
10. *The New Athens* – a Financial Model.

Peterson, Taleb, and the Theory of Value

‘We always live in a framework of value. There's no escaping that.’ – Jordan Peterson, *Address to the Oxford Union*, 2018

Currency, finance, economics – *money* in its broadest sense – is one means we have invented to measure that value and to study it and to share it; politics is one means we have invented to make judgments, and make decisions, and come together to make agreements about that value and our priorities for it; and law is one means we have invented to mediate and settle disputes about that value. But many people are disengaged from finance and from politics and from law. They have been persuaded that the parameters of that value are not theirs: either they are fixed, or the decisions about value which determine what happens in their lives are made by someone else – not by them nor for them. Or they are just ground down into apathy by watching the way the world works as it passes them by, shutting them out of what is important. But those parameters of value define the conditions for the possibility of every aspect of our lives, because our reality is based on value, and our civilisation is built to help us grow and exchange and share that value – or it should be. And why should they care about a system that does not help them and one that they know they cannot change.

Banking and law and political institutions and processes may seem far off to us, but that need not be the case. The blockchain has been discussed as a new kind of money, as a new kind of banking, as a new kind of law, even as a new kind of politics. Those ideas are all true. The blockchain is a tech platform which can apply the lessons of democracy to all these fields to rationalise and to reform them, as we first saw first applied with the rise of bitcoin as the world's first democratic currency. But these are weak comparisons – not incorrect but radically incomplete:

- because each of those fields only embodies one aspect of the power that the blockchain has – and it will have yet more power once it unites them together and recombines them in new ways;
- because by seeking to compare this new thing to topics we understand only too well – since we invented them during the course of our civilisation – they limit our imagination about what can be achieved and fundamentally focus on the old paradigm of money, not on the new paradigm of *value*;
- but most of all because what the blockchain represents is a paradigm *shift* in the way we engage with the world, and with value, and one which has been building very slowly for a very long time.

The appropriate comparison is not to a human invention which makes our civilisation run, made more efficient – or even more accountable – by some “innovative” new application of digital technology. Instead, and contributing to why there is such great misunderstanding of what the blockchain is and will be among both the industry and the public alike, the blockchain is a new language of value, a code, more of a kind with the kind of *biological* invention that is used in nature itself, and which we have not even today come to understand or replicate.

At *The New Athens* we have realised that the architecture of the blockchain represents the opportunity to model a form of DNA for Civilisation itself.

Bitcoin is both a cryptocurrency and the first blockchain. In terms of its obvious financial success bitcoin, as the world's first democratic currency, has demonstrated a clear *proof of concept* for blockchain tech. Bitcoin is to blockchain as email is to the internet – the first *killer app* that in the early days of the internet introduced a wide audience to its transformative capabilities in their daily lives. Since then, there have been many other killer apps on the internet as a platform, resulting in the *internet of information* that has transformed our way of life and democratised information on a wide basis – think wikipedia and google. But so far, in the new *internet of value* that the blockchain represents as a platform, only bitcoin has had transformative success. Many people have deduced from this analogy of blockchain to the rise of the internet the immense and transformative power of bitcoin and realised that the blockchain as an architectural system is a means to harness that power. To that end, they have formed a “blockchain industry” around bitcoin which seeks to replicate its success and in so doing has latched onto a syllogism which in their eyes explains that success. It goes something like:

1. bitcoin democratised currency;
2. bitcoin is a blockchain;
3. therefore, blockchain is a kind of currency.

That logic, focussing exclusively on the potential of blockchain to generate money, *shall be likened unto a foolish man, which built his house upon the sand. At The New Athens we liken ourselves unto a wise man, which built his house upon a rock*; that rock is democracy, and direct democracy was the factor that animated the bitcoin revolution in the first place, starting in 2008. We have also realised that although cryptocurrencies represent *low-hanging fruit* for an *Internet of Value*, and a necessary building block – the means by which that value may be determined quantifiably – there is in the current state of the blockchain a fundamental deficit in democratic thinking with regard to the potential of blockchain fully-formed.

As you know, our civilisation fundamentally does not now know what it is for. That is a hard problem but it is for us to solve democratically.

Maslow's Hammer

I suppose it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail.

Initial Coin Offerings (ICOs) have been the means by which the blockchain industry has launched its products, and have in the short term been very lucrative. Even in the name, mimicking *Initial Public Offerings* of company stock (IPOs), these entities are clearly riding on the coattails of traditional finance rather than carving out a theory of value which embraces the . Not only is it not doing the hard job of building that firm foundation in finding its own parameters, the blockchain industry is not even using all the tools of finance at its disposal. ICOs sell newly minted cryptocurrency coins for fiat currency – the equivalent of a crowdfunded public share offering – which is a great tool to democratise securities and make crowdfunding matter beyond donation by fairly exchanging that contribution with an asset which can be held and gain in value over time. But the ICO structure as it has been executed to date has unforeseen negative effects for the democracy within the blockchain: unbalancing the distribution of value and hence the power to manipulate the future of the blockchain both through currency manipulation and through vote rigging; allowing the same

cartels to come into existence on-chain as in the legacy economy that the blockchain is meant to reform. The blockchain industry is losing sight of the power of currency issuance itself to define the parameters of value and of the transformative power of democratic governance which shaped bitcoin and gave it its immense flourishing of value as an exit from fiat currency.

At *The New Athens* we bring together global experts and power-brokers in all the relevant financial and legal fields first to understand the purpose and aims of traditional finance, then to model them on the blockchain in “smart contract” form, finally to recombine their benefits through the democratic lens of blockchain’s *internet of value* function.

The New Athens – an overview

The New Athens is a blockchain institute, founded in London in 2017. At *The New Athens* we realise that the blockchain revolution, although innovative in terms of technology, is not unprecedented in terms of its function in our civilisation. In the republic of ancient Athens – a direct democracy – and in its carefully balanced civic institutions we find a model for the ambitions and for the scope of the blockchain as a technological vehicle to arrive at truth, guarantee value, and enable fair exchange among peers. In 2018 the blockchain as an industry and as a technology needs maturity, stability, and a vision of the public good to emerge from the adolescent gold rush stage that has characterised its progress in 2016–7. At *The New Athens* we are committed to that ambition and have the will to bring the blockchain to the world in tangible applications.

We live in a low-trust environment. This is the great problem which holds back collective human flourishing. With the advent of the blockchain revolution we have begun to see a glimpse of the immense wellspring of creativity that is locked away behind untrustworthy, inefficient, opaque, and corrupt information systems and we are now able to provide a solution to this previously intractable problem. We can now re-engineer concepts of trust, honour, and truth, which in our civil, political, and financial lives we find sorely lacking. Correctly calibrated, the blockchain harnesses the power of incentive to bend human behaviour towards the public good. The blockchain rewards enlightened self-interest with new forms of value. But the blockchain must be guaranteed by democratic republican institutions which secure the value and the ends we share.

art.cash – the art asset-backed cryptocurrency

The New Athens is committed to building truly democratic architecture on the blockchain from foundation upwards. With *art.cash* we begin with the participants in that democracy – its citizens – all of whom give value to the blockchain and receive the appropriate value in return, guaranteed and regulated by a democracy of their peers.

'Ruskin said: "Great nations write their autobiographies in three manuscripts: the book of their deeds, the book of their words, and the book of their art. Not one of these books can be understood unless we read the two others, but of the three the only trustworthy one is the last." On the whole, I think this is true. If I had to say which was telling the truth about

society: a speech by a minister of housing, or the actual buildings put up in his time, I should believe the latter.'

– Kenneth Clark, *Civilisation, A Personal View*.

Our art is both a record of our history and a prisoner of it. Clark, the great art historian, identifies this tension between what art says – which speaks directly for itself in a universal language, even when written and spoken languages are long forgotten – and what is said about art, which has been compromised by the immense temptation to profit by misinformation. This dichotomy is nowhere more visible than in today's art market where *deeds* do not yet exist, *words* are cheap and untrustworthy, and *art* is assigned value without sure guarantees of authenticity.

The book of our art – the vessel of our civilisation, and our shared heritage – deserves to be written faithfully to the best of our collective ability, not just for our own sakes but for that of posterity and of the public good. At *The New Athens*, we are for the first time applying the power of blockchain technology to this problem – to record our history reliably and indelibly, safeguarded by democracy.

the economic problem – the value of art

Art has always had currency – as a store of value over centuries – but now with *art.cash* art has a currency of its own, translating cash into art and art into cash interchangeably, seamlessly, and instantaneously on the blockchain – transforming art into a medium of exchange. Like cash art is a portable, tangible asset held in discrete units which can be exchanged anonymously peer-to-peer. In its appreciation as a store of value it outperforms other assets over time, but art is the most illiquid of assets which due to a lack of trust has never had the financial infrastructure around it – deeds, a property registry, a free market of provenance – to allow art to be commoditised and traded against financial instruments: mortgages, bonds, securities, derivatives, futures. *art.cash* provides a means to commoditise art.

Despite being worth \$2tn², the art market is crippled by a lack of standard financial products backed by a commodity value correctly to price art asset value:

- we cannot buy futures contracts in the 10-year bond yield of the oeuvre of Van Gogh;
- nation states cannot issue gilt edged bonds against their national art collections to fund Smart Cities projects;
- working artists cannot issue shares in their work to fund their career development;
- art collectors who are asset rich and cash poor cannot mortgage their art to release equity value from their tangible asset holdings while those assets remain in their possession rather than being sold on the auctioneer's block or locked away in a bank vault held against a safe keeping receipt;
- museums do not have enough space to exhibit all their holdings to the public or lend them with the confidence that they will be returned.

The lack of these financial products all derive from a lack of a bonded commodity price for art. Financial products need a standardised base layer of reliability in price and quality to operate – a

² Deloitte: *Art & Finance Report*, 2017.

basis grade – as with barrels of oil and similar commodities which may be traded interchangeably. Art gains such reliability through provenance – the certification of its authenticity and hence verification of its capacity as a store of value. But due to a lack of trust, the currency of that authenticity is low and cheap. Questions of provenance, audit trail of previous owners, authenticity, legitimacy of sale, identification and flagging of forgeries and fakes, unlicensed copies, and stolen goods all combine to make the art industry (and especially the secondary market) low-trust and hence inefficient for all parties involved in the supply chain.

As a store of value art has outperformed all other asset classes over centuries, but due to its primitive financial infrastructure, it is also the most illiquid of all asset classes. The story of art since 2008 is not dissimilar to that of bitcoin in that, along with gold, bitcoin and art have both proven worthwhile investments in reaction to the international economic crisis. Art is the portable, tangible, noncommodified asset class of choice to hedge against collapsing economies and turbulent markets. Today art weathers the storm as a store of value, remaining afloat for the long haul on the seas of uncertainty.

But art can only be mine if my property right to it is legitimate. If I purchase a fake, a forgery, an unlicensed copy, or stolen goods, then my title is void and my investment worthless. If the appraisal is incorrect or disputed, my costs increase exponentially. My ship sinks. That art asset value is more firmly locked into the object than comparable tangible asset classes, because it does not have that commodity base layer which grants liquidity. It is easier to sell a house than the art in it, because land in developed nations has a robust functioning deed and registry conveyancing system to provide trust – confidence in buyers and sellers: that the land exists and is owned by the seller, and that the buyer has the funds to execute the transaction. Art has no such registry or deed system, which *art.cash* is pioneering, modelled on land registries, with its blockchain democratic provenance registry, on-chain escrow, and smart contract deed exchange. Without a registry, the current legacy system results in inefficiencies, increased costs, and the enabling of fraud.

The custodianship of art – the common patrimony of all humanity – has for too long been the preserve of an industry group which tend to call themselves ‘the art world’. The analogy in itself – of an industry being a closed planet – a sphere with its own ecosystem, uncommunicative with what lies beyond it – is indicative of the fundamental problem: a lack of trust and transparency to the wider world – financial and cultural. Art has for too long been dominated by a financial illiteracy whose argument is that there cannot be a commodity price for art because there is an “aesthetic problem” standing in the way. Because one potential buyer may like a work of art and another loathe it based on differences in taste, they cannot arrive at a reasonable value for the work that any buyer would accept, because their willingness to pay is different, clouded as they are by their subjective aesthetic judgments – their preferences.

a direct democratic republic of art

The blockchain is truly revolutionary in that it brings democracy to fields in which we did not have a concept of democracy before – direct democracy, by the people and for the people. There was no concept of democratic money before bitcoin, only a series of fiat currencies issued coercively as legal tender in a territory controlled by a “trusted third party” – in this case a central bank attached to a national government – which was really a monopoly interest with no reasonable challenge to market dominance. Now, with bitcoin and the digital cash revolution, that monopoly

system has been broken, and the so-called trust in the third party arbiter revealed to be the coercive fiction it always was – it is not trust when there is no alternative. On the blockchain the participants in the network both look out for one another, and look at one another to make sure they are all dealing fairly, validating one another's value in a democratic spirit of mutual self-regulation.

Blockchains are much more reliable than any person or committee because their promises cannot be broken simply because a rump decides that political-economic expediency overrides the parameters under which trust is exchanged. The power of the blockchain lies in that it is 'not a system of proof by appeal to authority or to its author, but a system of independent and neutral mathematical proof which stands on its own.' The blockchain allows us to do democracy – everywhere – and, with the beauty of simplicity, solves for the first time the age-old problem of *quis custodiet ipsos custodes* – who watches the watchers. The answer? Everyone.

Since their unmooring from the anchors of the gold standard in the mid-20th century, governments and central banks have allowed an evolutionary niche to lie open in the currency space. Bitcoin moved to fill it. Bitcoin is 'an electronic payment system based on cryptographic proof instead of trust allowing any two willing parties to transact directly with each other without the need for a trusted third party.'³ Central banks proved unreliable guarantors of the currencies they issue in 2008, because they prioritised objectives of political economy over that of trust in their currencies. Quantitative easing in the trillions of dollars propped up the ailing banking sector but punished all other holders of those currencies through no fault of their own. The blockchain revolution was enabled by the advent of technologists becoming sufficiently confident that the internet hosted enough bandwidth to guarantee their transactions in such a way that they could not be corrupted – a distributed ledger. The proof is in the price when it comes to trust in the new economy. The first distributed ledger was a currency, bitcoin. The best analogue is email and the internet. Bitcoin is to the blockchain as email was to the internet – the first application which changed the world – in this case 'programmable money'. Where bitcoin represents a digital gold standard and digital cash, the scope of the blockchain is much wider. The blockchain can find quantifiable value above zero for every action, inaction, and unit of data; every quality may be quantified and all be made interchangeable with one another.

art.cash is the first real world application of the blockchain that demonstrates its power to effect change in a theory of value, applying this logic to art. Art appraisal represents a set of information bottlenecks and proprietary knowledge silos which prevent the free and fair exchange of provenance data on the value and authenticity of art. Before the blockchain in any number of fields we the people had no alternative but to place our trust in the authority of so-called "trusted third parties". That authority, placed inside institutional power structures and professionalised, inevitably becomes a matter of credentials, and loses its connection to democratic oversight and searching, impartial audit. In art appraisal this led to few independent data points as to the provenance of artworks and no intelligible audit trail of past success or failure on the part of "art experts". Conflicts of interest arise when appraisers are employees or contractees to parties in transactions such as auction houses and foundations. Often it is only the credentialised "authorities" who gain significant attention in debates as to art provenance, but there is a much wider forum of voices which are shut out of the "art world" but whose appraisals stand or fall on the evidence, not on preconceived notions of expertise. Authenticity is prized in art, but provenance is bitterly fought

³ Satoshi Nakamoto – *Bitcoin: A Peer-to-Peer Electronic Cash System* (31.10.08)

over and often discredited. This process is needlessly adversarial, expensive, and represents a high barrier to trade.

Democratic provenance, floated on the blockchain, can solve this problem. *art.cash* democratic provenance system provides the art industry with a single forum to debate and verify by consensus questions of provenance and an oracle as to the value and authenticity of art standardised across a wide field of potential appraisers, each rewarded for their useful labour with a cryptocurrency block reward, and each floating their own reputation for success or failure in appraisal on a democratic reputation system. Once *art.cash* can derive big data from the aesthetic preferences of a large constituency of art market participants judging the value of an art work and their willingness to pay, the “aesthetic problem” of the legacy art industry will disappear. With big data comes the ability to draw a normal distribution curve for the price of that work. The median, adjusted against the reputation of the analysts, forms *art.cash* commodity price for that artwork. Each artwork can have a different price, but each can be the commodity price of that artwork, derived from the same methodology and auditable in real time on-chain.

Further, smart contracts allow for unsurpassed transparency and security in transactions – two qualities which on the blockchain are combined when before they were competing priorities. Each party – buyer, seller, intermediaries, legal and financial professionals – must sign off that they have fulfilled their responsibilities and gained their compensation, each clause in the contract reviewed by the appropriate participants. Unless and until all clauses are met, the computer program cannot execute, and hence the property deed cannot transfer between counterparties; a backstop against any party emerging from the transaction unsatisfied.

art.cash presents the opportunity for those who care about the history and future of art and artists to come together democratically to build a new economy of art. *art.cash* harnesses the potential for mutual self-regulation of the art industry on the blockchain, and provides a secure, gold standard certification system by which artworks are authenticated, exchanged, tracked and traced, securitised, and insured, regulated by deed and logged against an immutable and incorruptible registry.

Appendix I: On Memes

Not only did the concept of a meme *describe* in Dawkins' terms the mechanism by which ideas are transferred across space and time, and lead to a science studying the evolution of ideas – memetics – but it went on to *do* something quite special: it began to evolve before our eyes. The term meme, coined in 1976, took on a life of its own intertwined with the genesis of the internet (*the internet of information*) around the turn of the millennium, then becoming a catalyst for a new kind of expression – *the internet meme* – alongside the rise of social media (*the internet of relations*), and is about to make another paradigm shift with the advent of the blockchain revolution (*the internet of value*).

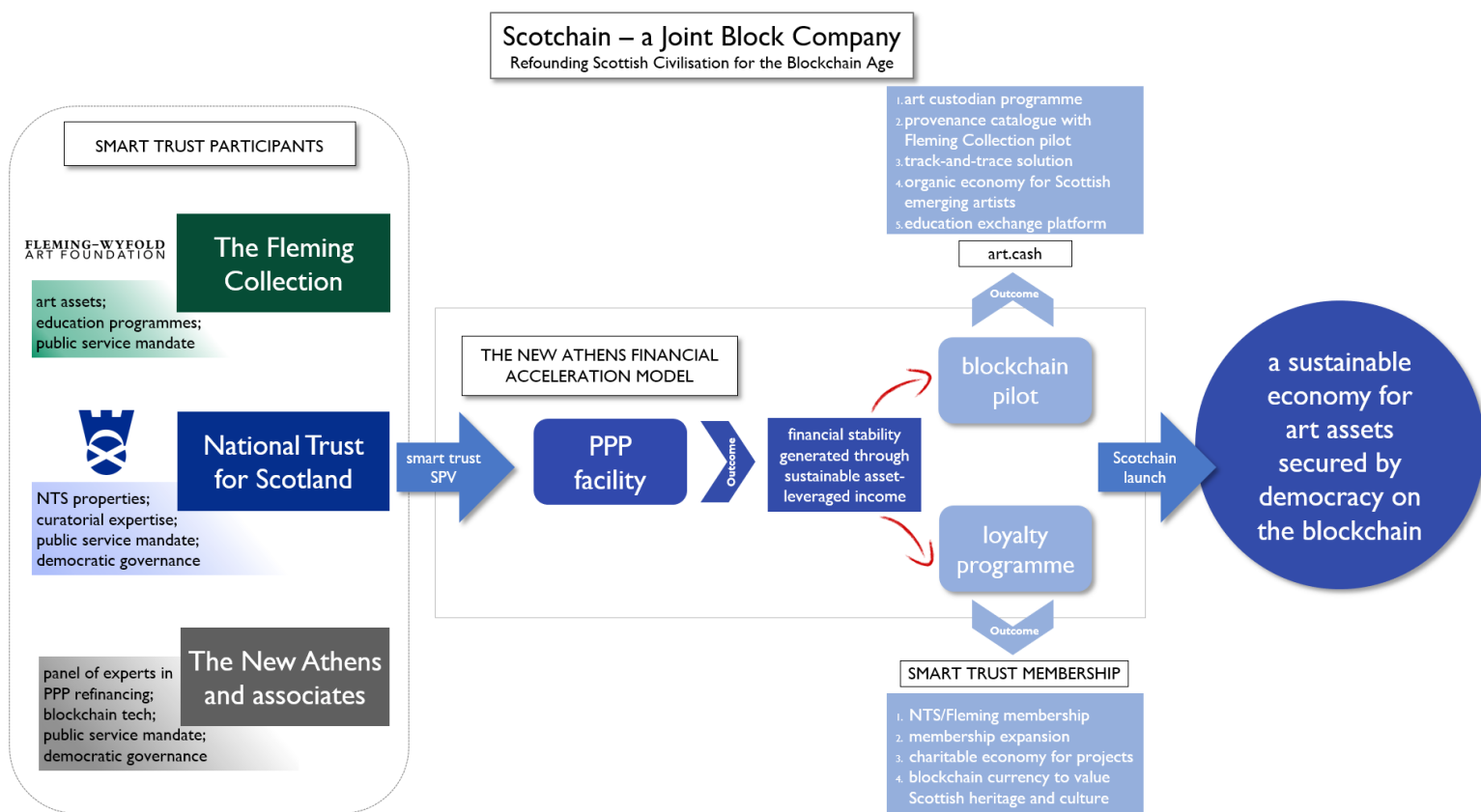
The meme as a unit of information exchange *harnesses* the attributes of the internet itself – a new international, instantaneous medium for the transfer of ideas – to create a new form of highly infectious idea expression built to maximise its propagating function within the architecture of the internet. The ensuing meme revolution showed us empirically how information spreads among people at a granular level as humans began to apply creativity and imagination to explore the new platform the internet gave them for the propagation of ideas. It also gave us a live illustration of memetic evolution in action, which looks very much like the explosion of genetic evolution that occurs when organisms gain access to a new environment and seek to colonise it and find its evolutionary niches.

There is a notion current today in the popular understanding that internet memes are a shallow form of expression, all surface, no depth. Even that the internet itself, despite presenting people with more and better information than they ever had available to them before, paradoxically lowers attention span and information uptake instead of increasing it by the very means of “overexposing” people to too much information concurrently, and too many opportunities to access it. Even though fundamentally the antidote to ignorance is information – and the way to get better at a skill, such as gathering, parsing, and retaining information, is to practice it – this notion persists.

Memes are not only evolving better to conform to and exploit the conditions for the possibility of their propagation provided by their media, such as the internet, but like organisms as they evolve, memes are making second-order changes to their environment itself. To answer the accusation of shallowness, firstly memetic evolution needs to iterate a number of generations in order to arrive at the best fit to that medium and its interaction with human consciousness, but secondly civilisation lacks and has always lacked a key substrate that gives genes their success. Information revolutions: the discovery of spoken language, of writing, of the printing press, of the internet – might be comparable in their accelerating the rate of change of ideas to step-changes in genetic evolution: the cell, multicellular organisms, photosynthesis, the skeleton, the move onto land, flight – which opened up new environments for genes to exploit. Internet memes, for instance, with a footprint and trail of their propagation across different nodes in a network, and a more naturally selected distribution measured in the success of that propagation, resemble genes by one dimension more than legacy media. But what civilisation does not yet have is the substrate, the DNA.

The blockchain is that DNA.

Appendix II: Scotchain – a Joint Block Company New paradigms in Proof of Concept for Institutional Blockchain



The Fleming Collection has immense potential, not only to refund itself as a major art institution preserving and communicating the heritage of Scottish civilisation to the world, but to form the nucleus of a new renaissance of that civilisation in the oncoming Blockchain Age and the economy which will emerge out of it – combining all the strengths that make Scotland great: art and aesthetics, learning and philosophy, commerce and technological innovation. At The New Athens we have realised that the deep institutional roots The Fleming-Wyfold Art Foundation holds in private banking put it in an unique position to understand at this early stage in the genesis of the blockchain how to harness its transformative power to shape the future of art finance and beyond.

There is before us in Scotland an exciting opportunity to advance the aligned interests of two illustrious Scottish cultural institutions towards a future of prosperity, innovation, and yet greater service of the public good with which they have been entrusted. The New Athens and associates have identified that by coming together under the banner of a blockchain economy for art assets (art.cash) and loyalty, engagement, and citizenship (the Smart Trust), The Fleming-Wyfold Art Foundation and National Trust for Scotland can, while strengthening their stewardship of Scottish civilisation with traditional financial models, shape and govern the future of that civilisation with the democratic power of blockchain technology. At The New Athens we need the help of aligned institutions to instantiate our proofs of concept on large scale institutional projects, and see

Scotland in its particular qualities of autonomy and cultivation as a kind of “Smartlab” to test and prove these new paradigms.

Both *The Collection* and *NTS*, emerging as they do from the tradition of The Scottish Enlightenment, understand these guiding principles and embody the same in their founding documents and civilising mission. To this end, *The New Athens*, as a blockchain foundation for the democratic safeguarding of art, was named for and inspired by the ambition of The Athens of the North. Our vision is that by combining the deep expertise in the best that has been thought and said in that first Scottish Enlightenment – from the aesthetics of Robert Adam, and the empiricism of David Hume and Adam Smith, to the enterprising, adventurous, yet highminded spirit of the Joint Stock Companies – we can together shape democratic technologies and institutions to become custodians of a new much overdue second Scottish Enlightenment for the Blockchain Age in the form of *Scotchchain* – a Joint Block Company.

Widely reputed to be the finest private collection of Scottish art in existence – almost 1,000 oils and watercolours from 1770–present – the *Fleming Collection* was saved in 2000 for the public during the sale of the eponymous bank and held under a trust whose objectives instantiated those Scottish Enlightenment principles shared by *The New Athens*. After the unfortunate closure in 2015 of the collection’s London headquarters at 13 Berkeley Street, it is clear that the first and most pressing priority is to get the *Collection* out of storage, back on public display, and financially independent so that it can fulfil the objectives of the *Fleming-Wyfold Foundation*. *The Collection* has great potential, first as an asset to seed the revival of its own fortunes, then as an aligned institutional partner toward *The New Athens*’ ambitions to build a sustainable, organic, autonomous economy for art on the blockchain, guaranteed by direct democracy. *The Fleming*’s objectives – of education and the funding of bursaries, the promotion and mentoring of Scottish emerging artists, the loan and exhibition of work to place them in the public eye and consciousness, and the place of art as cultural diplomacy – are all those which *The New Athens* shares and seeks to augment with blockchain integration.