Chris Lee is a graphic designer and educator based in Lenapehoking (Brooklyn, NY). He is a graduate of OCADU and the Sandberg Instituut. His research/studio practice explores graphic design's entanglement with power and standards through the document. Chris is an Assistant Professor in the Undergraduate Communications Design Department at the Pratt Institute.

• https://cairolexicon.com

FRAUD (Audrey Samson and Francisco Gallardo) is an artist duo whose work has been exhibited internationally. With their spatial practice, they develop forms of art-led enquiry that examine financialisation through extractive practices and cultivate critical cosmologies. Audrey is a professor of more-than-computational art at l'école de recherche graphique (erg) and Francisco contributes to the pedagogy of the MA Art and Science at Central Saint Martins. FRAUD's current investigations can be explored through the EURO–VISION platform.

• https://euro-vision.net

Immutability, Management, Trees
*Chris Lee, FRAUD
(Audrey Samson
and Francisco Gallardo)*

The following presents an asynchronous and tangential exchange between Chris Lee and FRAUD (Audrey Samson and Francisco Gallardo) as they shared a collection of artefacts as a means to explore the resonances of their interests. Their conversation reflects on how documents – a banal artefact – are entangled with statecraft and colonialism, and asks what if documents as such would not centre around logos, websites, books and apps but design education, exemplified by things like money, passports, property deeds, birth certificates and so on?

figure 1

Chris Lee, *To Counterfeit is Death*, 2017. Courtesy of Chris Lee.

Chris Lee

To start, we wanted to provide some sense of what is meant by immutability. This coin (figure 1) was designed to illustrate and narrate some "techniques". It has three

surfaces and suggests at least as many possibilities. The "heads" surface is a reproduction of the relief image at the top of Hammurabi's stele (eighteenth century BCE), one of the earliest records of a comprehensive legal code. Any legal code is inherently contentious and contestable. An inscription on the stele immediately below the relief states that this code is not the invention of a fallible mortal but is rather of divine provenance – handed to Hammurabi (standing) by the Sun God, Shamash (seated with arm extended) – and therefore beyond reproach. Common interpretations of the scene identify the objects in Shamash's hands – a ring and a sceptre – as symbols of power. Other interpretations decipher these forms as a peg and a coil – surveyor's tools akin to the slightly more familiar Gunther's Chain – held by the ultimate adjudicative authority, signifying the divine and exclusively legitimate right to measure.

figure 2

Hammurabi's stele, also known as the Code of Hammurabi. Note the peg and coil (often interpreted as a rod and sceptre) held in the right hand of Shamash (the seated figure on the right). Source: Wikipedia. Courtesy of Rama, cropped image, CC BY-SA 3.0 FR DEED.
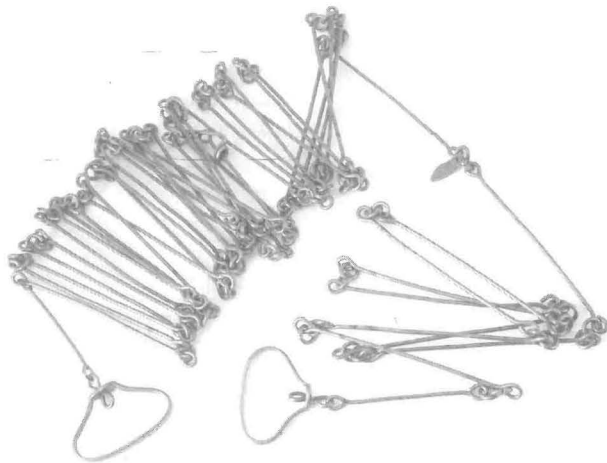
figure 3

Gunter's chain, designed by English clergyman and mathematician Edmund Gunter (1581–1626), was used for land surveying until the early twentieth century. It served as a legal standard for measuring property for judicial and commercial purposes throughout the British Empire and enabled the drawing of enclosures. One whole chain contained one hundred iron links, with three joints between each link for flexibility. Distinctive (brass) tags were placed every ten links for ease of use, measuring 10.06 metres in length. Credit: Preston R. Bassett, National Museum of American History, Smithsonian Institution, Washington, DC. Retrieved September 4, 2023, from https://americanhistory.si.edu/collections/search/object/nmah_1065091

It is also important to underline that this code of laws was inscribed carefully on black diorite and laid out on an orthographic grid, with its chiselled white inscriptions legible against a polished, dark stone substrate – a storage medium capable of transmitting information across millennia. Its securitisation also rests on the establishment of some kind of morphological normativity. The finely chiselled cuneiform inscriptions could not be altered without arousing suspicion of counterfeit authorship. In principle, any attempt to modify the code's inscriptions would be discernible against the deliberately smoothed stone within the tightly planned graphic space.

The "tails" of the coin reproduced the inscription "To Counterfeit is Death", illustrating the use of coercion to protect the value/meaning of an inscription. This is taken directly from early American paper notes printed in and around the time of the Revolutionary War. With a lack of reliable coin, colonial administrators took to printing money to lubricate the local economy. Similar threats are found in other examples of paper money. The first paper money, according to the archaeological record, printed in China includes a warning that basically translates to: "The Emperor punishes counterfeiters; informants will be rewarded." Approximately 500 years later, the engraver Jean-Pierre Droz's design for the Assignat, issued to pay the salaries of French soldiers occupying Netherlands, included a similar admonishment. In all these cases, it was understood that printed paper was highly vulnerable and unstable as a form of money and that the securitisation work done previously by precious metals would instead have to be performed by the state.
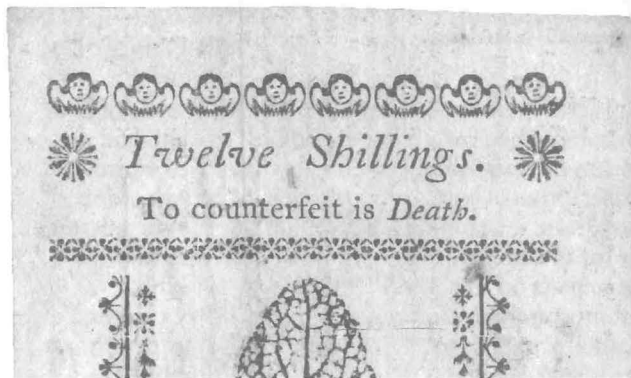
figure 5

Inscriptions that threaten counterfeiters and/or promise to reward those who report on them can be found on some of the earliest examples of paper money from the Ming dynasty (1368–1644), China. The introduction of printing techniques using moveable typography for the production of paper money opened up a vulnerability to the state's exclusive right and capacity to inscribe value. Threats and warnings remind citizens of the state's power to determine whether someone lives or dies. The inscription's securitisation here rests not on the divine authority of a deity but on an appeal to its modern, political iteration. Source: Deutsche Bundesbank.

figure 4

Province of New Jersey, 12 shillings colonial currency (reverse, detail), Friedberg Colonial ref. no. NJ-179, printed by I. Collins, 1776, print, paper, 5.6 × 9.9 cm. Source: Wikipedia. Courtesy of the National Numismatic Collection, Smithsonian Institution, Washington DC, CC BY-SA 3.0.

figure 6

A decommissioned £50 note depicting Matthew Boulton on the left and James Watt on the right. It is protected by various security features ("silent policemen"). Annotations on the image read as follows: 1. Cotton-based paper; 2. Microprinting; 3. Motion threads and randomly dispersed UV threads, visible under UV light, throughout; 4. Metallic thread; 5. EURion field; 6. See-through, register of, "£" symbol; 7. Watermark; and 8. Serial number. Bank of England, 50 Pound banknote, showing Elizabeth II, Matthew Boulton and James Watt. Printed by Thomas de la Rue & Company Ltd. (London), 2011, ink, paper, various security features, 15.6 × 8.5 cm. Courtesy of the Museum of Applied Arts & Sciences, Sydney, ma.as/426371.

The third surface is the coin's edge. We see here a "reeded" or "milled" edge. At a time when coinage was minted in precious metals, there was a criminalised practice called "clipping", whereby the edges of coins would be shaved or clipped to extract some amount of gold or silver while retaining the coin's "face value". Such practices were punished severely, sometimes with death. However, absolute enforcement of the prohibition would be costly both financially and politically. The Soho Mint, established by Matthew Boulton, the early British industrialist and business partner of James Watt, hired various people to develop the mint's ability to inscribe edge designs onto coinage. This feature established a normative condition whereby the presence of the textured edge on a coin gave its receiver greater confidence in the integrity of its face value. The absence of the texture would immediately arouse suspicion and delegitimise the coin.

As a corollary, Boulton's mint was the first to employ steam-powered presses. Minting coinage was, in fact, one of the steam engine's earliest applications. The industrialisation of the process removed the fallibility of human manufacture from key parts of the minting operation. For instance, the machinery included mechanical counters that would track each time a coin was pressed: as a transparency and accountability measure. In an indirect way, this algorithmic computation could be regarded as a primitive antecedent to technologies like blockchain in its application to cryptocurrencies like bitcoin. That is, immutability depended on the displacement of inscription from any form of subjective human intervention. The algorithm (i.e. SHA-256) may be the contemporary instantiation of the divine and state authority, exemplified by the pithy statement favoured by crypto-enthusiasts that "code is law".

My research in the book Immutable: Designing History[1] is thus an initial foray into charting an array of techniques of immutability, that is, techniques for the design of documents. Though this doesn't claim to be a comprehensive and inarguable list, they are Material (e.g. clay or stone), Technical (i.e. printing or reproduction), Homicidal (i.e. "to counterfeit is death"), Orthographic (i.e. grammar or education), Algorithmic (i.e. blockchain), Speed/Displacement (i.e. submarine cable network). Perhaps some of these can be elaborated on in our exchange.

FRAUD

On the one hand, we have design enforcing and normalising standardisation and measurement through a set of recognisable (and reproducible) parameters. Thus, in your formulation, immutability constantly seeks to

[1]   Available at https://www.onomatopee.net/exhibition/immutable.

secure a contingent claim to power. Perhaps, conversely, the challenge to power is found in the contestation of its immutability and the tools that instrumentalise its solidification. Considering contemporaneous claims to truths and the apparent impossibility of proving their veracity, we would like to put forward the notion of narration (a long-time stronghold of design) as a locus of power enaction where design operates in collusion with power towards the domination of a specific narrative by way of shaping and governing truth.
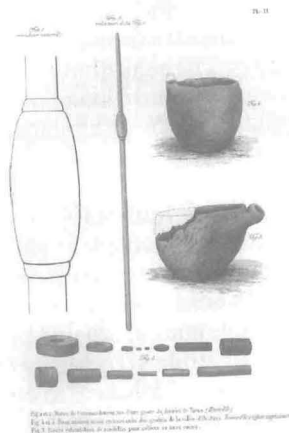

figure 7

The earliest archaeological reports from studies conducted on the Canary Islands are, arguably, those by Sabin Berthelot, in which there is also an attempt to trace commonalities with French artefacts in a move to claim rights of access to the territory. See: Berthelot, S. (1879). *Antiquités canariennes ou annotation sur l'origine des peuples qui occupèrent les iles fortunées, depuis les premier temps jusqu'à l'époque de leur conquête.* Paris: E. Plon et Cia, Plate II.

As you present several archaeological artefacts in your manuscript, such as Hammurabi's code and the calculi, as tools or materialisations of standardisation and claims to power, we offer here an example of mutable

archaeology or the weaponising of archaeological evidences: instrumentalised, in this case, by the Francoist regime.
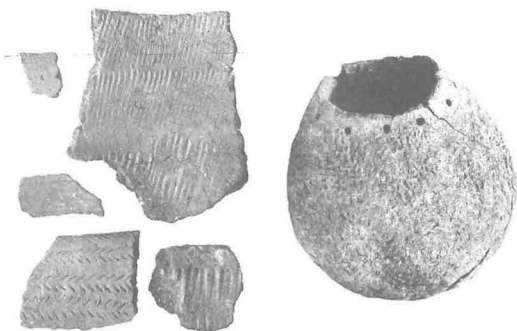

figure 8

Western Sahara ceramics studied by Martinez Santa-Olalla, who – despite evidence to the contrary – affirmed them to be the precursor of the Canarian gánigo to validate the occupation of that territory by Spain. See: Martinez Santa-Olalla, J. (1944). *El Sahara Español Anteislámico (Algunos resultados de la primera expedicion paletnologica al Sahara.* Madrid: Ministerio de Educación Nacional.

Officials like Julio Martinez Santa-Olalla and Martín Almagro Basch formulated archaeological theories that legitimised the Spanish regime's newly "acquired" frontiers by (falsely) claiming that the Canarian Gánigo, a distinct vessel made of clay, which had both domestic and religious functions, bore relations to Saharan ceramics that were buried in desert wadis (seasonal stre ...s) to collect rainwater. The Hispanic claims over the Canary archipelago served to validate the Spanish Protectorate of Morocco and Western Sahara, regions endowed with abundant resources, such as phosphate rock, sand, fisheries and onshore oil deposits. Though the argument of provenance was used to justify the occupation, for Spain, archaeological evidence glowed brightly with extractivism, and it was partly through tourism that these fictional narratives became

normalised. While post-war Europe was being shored up as civilisation du loisir, tourism was incorporated as a strategic export by the propaganda apparatus of the Spanish state. One of the most prominent departments was the Ministry of Information and Tourism, often referred to as the Ministry of Propaganda. Throughout Spain's fascisticised modernity, aggressive disagrarisation was followed by tourism-led development in the Canary Islands, whose characteristic golden sand beaches on the western islands have been effectively made with illicitly imported sand mined in Western Sahara, a practice that has been documented for decades and continues to this day.[2]

figure 9

FRAUD, *Fictions of the Primitive II*, 2020. The glass gánigo was made by melting sand sourced from Playa Mogán (Gran Canarias). These beaches have been replenished   lecades with illicitly mined sand from Western Sahara. Vessel fashioned by glass blowers Torsten Rötzsch and Louise Lang. Photo: Hannah Jung.

The vessel replica we included here (figure 9) is one that glass blowers Torsten Rötzsch and Louise Lang shaped with glass melted from Saharan sand that lines Gran Canaria's Hesperian beaches. Anecdotally, this is the same sand that so delighted German tourists, who were

2 As documented by Western Sahara Resource Watch, https://wsrw. org/en.

the most strongly represented demographic to travel to the Canary Islands in the 1960s, during its period of most dramatic tourism growth. As a testimony to the acceptance of the regime abroad, the presence of foreign tourists and their documented leisurely enjoyment was crucial. It is in this respect that this replica, Fiction of the Primitive II, becomes a testimony to the mutability of narrative mobilised through leisure and its representation in the likes of postcards featuring crowded golden sandy beaches and characteristic ceramics with the obligatory signature greeting: Viele Grüße aus Canaria. What happens when archaeological evidence is itself mutable, and ascribed meanings change with time and regime changes? As we are witnessing similar misreadings resurfacing, can we also understand Immutable as a toolkit with which to counter these phenomena? More than tools for visual literacy based on decoding symbols, is this a pedagogy directed towards ever-changing meta-solidifying powers?

Perhaps this is an apt segue into the technology of blockchain underlying crypto and NFTs mentioned earlier, which was ostensibly meant to contest traditional institutional powers' hold upon currency and the art world. The irony of this ideological defiance being deployed with absolute immutability is certainly not lost on us. In your manuscript, you weave a powerful argument that traces the locus of objectivity from that of divine providence symbolised, for example, in Hammurabi's rod and coil, towards its replacement by inhuman reproduction, which is understood as purely objective, such as the Public Land Survey system. The instrument of power becomes somewhat anonymised and difficult to account for when it no longer lies with the gods but, rather, with the technology of reproduction. Cryptocurrency (and NFTs) operates under the auspices of the immutability of its technology; its very strength

lies in its pledge to deliver an exact sequence, unchanged – the latter guaranteed by the finite limits of computing power, which thus far could only be potentially challenged by quantum computing. In your book, you develop these themes in relation to the measurement standard tracing the locus of its governing authority from a divine providence to the divine objectivity of inhuman reproduction. Could you expand upon this thread as well as your thoughts on the adoption of the immutable by the vectoralist class, the intransigence of blockchain, and where that takes us in the context of your call for a graphic design that embraces contingency, negotiation and entropy?

Chris Lee

Your example of the Francoist mobilisation of archaeology and tourism is quite apt, I think, as an imbrication of design and historiography – or rather, the investment (the dressing up) of artefacts with national origin mythology on the basis of superficial morphological similarities between Saharan and Canarian Gánigo ceramic vessels. I also agree with you about narration being the principal issue here because although the facticity of claims made about a rtefact may be effectively indisputable – it is made out of clay, it was found in Morocco, it is x-number of years old, it has measurements of etc. – it is in the arrangement of these facts that the gap between the objects and the truth(s) they lay claim to becomes discernible. Even if one conceded to the Francoist archaeological premise that the Spanish, Saharan and Canarian ceramics share some direct genealogical relationship, claiming historical political unity on the basis of morphological similarities holds just as much water as the contention that the people who ended up in the Canarias were actually fleeing and attempting to dissociate from their continental cousins. So, perhaps, rather than narrating

a shared mythological origin, these ceramics might be telling a story about an ancient schism.

In any case, what such Francoist or nationalist archaeologically grounded narratives seem to premise their narration on is the idea that provenance is proof. And so, when it comes to something like blockchain technology, you can see that its operational premise is not so different. The other method for actuating immutability that is at play here – as a process meant to deflect the possibilities for contesting an inscription – has to do with the displacement of authorship to some kind of third-party agency. Again, in the Francoist story above, the third-party agency is embodied in the "invisible hand" of iterative creative imitation, habit and perhaps craft (that is, ethnic) tradition. With blockchain, it is the "invisible (algorithmic) hand" that generates through "mining" SHA-256 hashes, enveloping them with other hashes, time stamps and unique nonces, to stabilise claims about the uniqueness of otherwise infinitely reproducible digital artefacts (i.e. bitcoins). The nominal legitimacy (perhaps that phrase is redundant) of blockchain artefacts, such as cryptocurrencies, is premised on this impersonal and, thereby, ostensibly apolitical, autonomous and non-institutional inscription process.

If there is a techno-progressive narration of techniques of immutability, then it is a grim parable that sees as its current apotheosis a universally instantiated autonomous ordinator in the cloud that has evacuated human fallibility and political contingency from its graphical inscriptive process. Far from being an advancement or a marker of progress, this actually takes us to the same place as the investiture of Hammurabi – the dressing of the Babylonian king – with the symbols of the Sun Deity, who alone holds the right to measure and count. According to one translation, the inscription immediately

beneath the relief image reads something to the effect of: "Hammurabi, the king of righteousness, on whom Shamash has conferred right (or law) am I."[3] This is a displacement of authorship and authority onto an irreproachable divinity. Perhaps provenance and displacement are two aspects of the same technique – the appeal to a distant thing, i.e. to a mythical or divine origin.

I'd like to play a bit with the Anglo-French sense of the word "appeal/appeler" and consider where that puts design in relation to the intransigence of blockchain. On the one hand, synonyms for this word include designation (to call/name), nomination (to call upon, entitle), and denomination (to categorise, order) – each of which has, I think, an affinity with the practice of what Paulo Freire calls "naming the world".[4] On the other hand, blockchain is that which is designed precisely to enact a foreclosure on writing and naming, too, for that matter. Writing and naming – as forms of agency – are ceded to a process whereby there is no practical possibility of negotiation, mutation or negation, thus figuring a scenario that is void of the political. In essence, blockchain is an appeal to the autonomous agency of an algorithmic process – a dis̶ ̶sionate, objective and unanswering authority.

This is where I would start locating a ground against which to figure a field of study, perhaps to inaugurate a community of practice oriented towards studying and instantiating forms that, in contrast to the kind of archival indelibility sought by blockchain technology and other documental formats, instantiates knowledge and memory while acknowledging their contingency and negotiability.

3   The Code of Hammurabi (L.W. King, Trans.). (1907). The Avalon Project. Retrieved November 29, 2022, from avalon.law.yale.edu/ancient/hamframe.asp

4   Freire, P. (2005). *Pedagogy of the Oppressed*. Continuum.

One partial illustration of this might be a local demurrage currency issued in Wörgl, Austria, during the Great Depression. The primary feature of this currency was that holders would have to affix a validating stamp to each bill every month in order to be able to spend it. However, each stamp represented an approximately 1% reduction in face value, effectively meaning that the money decreased in value over time, much the same way that natural commodities do. This had the macroeconomic effect of accelerating the relative "velocity" of circulation, meaning that a small number of shillings was able to facilitate an exponentially larger volume of exchange in the same amount of time that the official currency would have been able to. More than anything, the point this illustration makes in our discussion is that entropy as a deliberate design feature generally seems inimical to the progressive orientation of innovation in design.
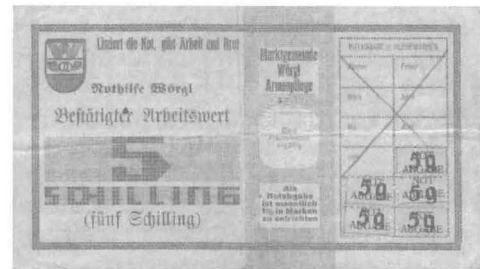

figure 10

A Five (5) Schilling Wörgler Schwundgeld banknote, validated from August 1932 to December 1933. Public Domain.

Other precedents and the potential historiography[5] of such a "design" praxis are to be found within societies whose names have been suppressed or obliterated and

5   See: Azoulay, A. A. (2019). *Potential History: Unlearning Imperialism*. Verso Books.

upon which other names, generated as a matter of course in the administration of this or that colonial entity, have been imposed. To the extent that design might be understood as a field of study and practice that entails the negation of imposed names with what Ariella Aïsha Azoulay calls "potential" ones, it may also include "criminal" practices ranging from counterfeiting to outright destruction. David Graeber has reminded us that since ancient times, every uprising of the underclasses has, in some form or another, included the destruction of the records kept by the oppressive entity.[6] And what is the relevance of such practices to design? Well, when the stakes become clearer, one ought to be ready to abandon the limits of these professional and institutional categories.

Coming back to naming, I'd like to steer us towards the scale of the glyph. In his text "Visualization and Cognition",[7] Bruno Latour advises us to look for the flat surfaces that facilitate "mastery" and "domination". These surfaces, which often fit on a desk (or a screen), are composed of typographic representations – numbers, labels – of the world. Michael Hobart and Zachary Schiffman would call these "investments", dressing things in the world up in ways that make them legible as information and available for management. Similarly, Jonathan Beller would characterise information as the transposition of thick, contextual lives to the dimensions of that which fits into the columns and rows of a spreadsheet – digitisation – to transpose the life

6 Graeber, D. (2011). *Debt: The First 5,000 Years*. Melville House Publishing, p. 82.
7 One of Bruno's seminal texts, "Visualization and Cognition: Drawing Things Together", can be found in: *Knowledge and Society Studies in the Sociology of Culture Past and Present* (H. Kuklick, Ed.). Jai Press, 1–40. This text can be read in full here: http://www.bruno-latour.fr/sites/default/files/21-DRAWING-THINGS-TOGETHER-GB.pdf.

of a lamb to the commodified ontology of mutton. Furthermore, Johanna Drucker cautions us that all (information) visualisations are essentially "arguments made in graphical form".[8]

◇	B	C	I	J	K	L	M
2	–				Real GDP growth		
3					Debt/GDP		
4	Country	Coverage	30 or less	30 to 60	60 to 90	90 or above	30 or less
26			3.7	3.0	3.5	1.7	5.5
27	Minimum		1.6	0.3	1.3	-1.8	0.8
28	Maximum		5.4	4.9	10.2	3.6	13.3
29							
30	US	1946-2009	n.a.	3.4	3.3	-2.0	n.a.
31	UK	1946-2009	n.a.	2.4	2.5	2.4	n.a.
32	Sweden	1946-2009	3.6	2.9	2.7	n.a.	6.3
33	Spain	1946-2009	1.5	3.4	4.2	n.a.	9.9
34	Portugal	1952-2009	4.8	2.5	0.3	n.a.	7.9
35	New Zealand	1948-2009	2.5	2.9	3.9	-7.9	2.6
36	Netherlands	1956-2009	4.1	2.7	1.1	n.a.	6.4
37	Norway	1947-2009	3.4	5.1	n.a.	n.a.	5.4
38	Japan	1946-2009	7.0	4.0	1.0	0.7	7.0
39	Italy	1951-2009	5.4	2.1	1.8	1.0	5.6
40	Ireland	1948-2009	4.4	4.5	4.0	2.4	2.9
41	Greece	1970-2009	4.0	0.3	2.7	2.9	13.3
42	Germany	1946-2009	3.9	0.9	n.a.	n.a.	3.2
43	France	1949-2009	4.9	2.7	3.0	n.a.	5.2
44	Finland	1946-2009	3.8	2.4	5.5	n.a.	7.0
45	Denmark	1950-2009	3.5	1.7	2.4	n.a.	5.6
46	Canada	1951-2009	1.9	3.6	4.1	n.a.	2.2
47	Belgium	1947-2009	n.a.	4.2	3.1	2.6	n.a.
48	Austria	1948-2009	5.2	3.3	-3.8	n.a.	5.7
49	Australia	1951-2009	3.2	4.9	4.0	n.a.	5.9
50							
51			4.1	2.8	2.8	=AVERAGE(L30:L44)	

figure 11

The infamous Reinhart and Rogoff spreadsheet that has been used to justify austerity policies the world over. The argument was premised on a "range error" wherein the researchers failed to include in their calculations data from countries with higher debt-GDP ratios (see cell L:51), leading them to conclude that a high debt-GDP ratio meant reduced growth. This is one of many images circulating on the internet, and we believe it comes from a study by Thomas Herndon, Michael Ash and Robert Pollin of the University of Massachusetts, Amherst; academics who, in trying to reproduce Carmen Reinhart and Kenneth Rogoff's results, ended up discovering their Excel error. See: Herndon, Ash and Pollin (2013), *Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff.* Working paper 322, Political Economy Research Institute, University of Massachusetts at Amherst. Excel screenshot taken from article: Konczal, Mike (2013). *Shocking Paper Claims That Microsoft Excel Coding Error Is Behind The Reinhart-Rogoff Study On Debt.* Businessinsider. Image courtesy of Businessinsider.

I'm wondering if we could try to spin out these ideas of transposition and scaling down to the glyph as

8 Drucker, J. (2014). *Graphesis: Visual Forms of Knowledge Production.* Harvard University Press, p. xi.

techniques of management: whereby things are designated (named), for instance, as a numerical representation, in order to facilitate their availability to governance. We've talked before, a little bit, in different contexts and at different times, about scientific forestry. Perhaps we could pick this up again?

FRAUD

Yes! Indeed, naming as a technique of management bears the tension of erasure, identity prescription and construction, as well as affirmation – a powerful tool in all of these denominations. Scientific forestry and the categorisation of flora and fauna upon which it arguably lies is a rich terrain within which these tensions unfold. For example, when we investigated forestry management in Finland (during the period in which it was ruled by the Swedish crown), we stumbled upon a well-known picture of Linnaeus in Sámi dress. Given that he had categorised indigenous peoples as Homo Monstrosus in his now infamous ordering of nature "Systema Naturae",[9] the embodied nature of this appropriation seemed particularly sordid. In the image, he is holding a shaman drum, which is used for certain rituals, as well as a flower of the species that, in all humility, he renamed after himself: Linnaea borealis. What sort of spectacle is this? Desacralisation?

9   Systema Naturae distinguishes four categories of human species. The other three are: Homo Europaeus, light-skinned, muscular, inventive and governed by laws; Homo Americanus, copper-coloured, choleric and regulated by customs; Homo Africanus, black, phlegmatic, indolent and governed by impulse (Linnaeus, C. (1758). Systema Naturae Per Regna Tria Naturae: Secundum Classes, Ordines, *Genera, Species, Cum Characteribus, Diferentiis, Synonymis, Locis* (10th ed., vol. 1). Impensis Direct. Laurentii Salvii, pp. 20–22). Homo Monstrosus were regarded as degenerate and freakish creatures (Koerner, L. (1999). Daedalus Hyperboreus: Baltic Natural History And Mineralogy In The Enlightenment. *The Sciences In Enlightened Europe* (W. Clark, J. Golinski & S. Schaffer, Eds.). The University Of Chicago Press, p. 416). We have written about this more extensively here: www.hiap.fi/carboniferous-capitalism1.

Domination by designation? Is he wearing the skin of the monstrous human?

figure 12

Carolus Linnaeus in Laponian costume (1853) is a replica painting by Hendrik Hollander of an original portrait by Martin Hoffman, first commissioned by Estate Hartenkamp in 1737. Linnaeus is pictured showing the twinflower (*Linnaea borealis*) in his hand (that Jan Frederik Gronovius named after him), with elements of Sámi dress and a shaman drum. Courtesy of the University of Amsterdam. Public domain.

Linnaeus' nomenclature is an important aspect of the genealogy of nature-as-resource we became interested in. It can help to elucidate the ontological commodifying shift instantiated through the discourse of forest management, the latter often marketed as a necessary response to increasing scarcity and facilitated by scientific designation and representation. We were thinking about how nature

became defined in contradistinction to "civilisation" and how this circumscription modulates our understanding of forests today. Designation and naming are key here, a condemnatory instantiation of which the management of environmental resources presents the valuation of so-called "natural capital". If we understand the financialisation of nature to be economic reasoning and market approaches applied to "nature", our analysis must turn to systems of measurement and categorisation employed in the market economy, namely, how the term "productive" is specifically defined in this context. The subscript, somewhat expectedly, is: what can be productive to commodity trading? But how exactly is that mobilised? Lorenzo Fioramonti brings attention to terms defined by the UN's statistical framework used to integrate economic and environmental data, the System of Environmental-Economic Accounting (SEEA). Effectively directing the governance of ecosystem services, this framework is established upon a terminology that it has itself defined. According to the SEEA, what is deemed productive "must be carried out under the instigation, control and responsibility of some institutional unit that exercises ownership rights over whatever is produced".[10] In How Numbers Rule the World, Fioramonti outlines how this is implemented and shows how devastating such a definition can be. In relation to fish, for example: across the world's oceans and water bodies, if the fish stock is not managed by a proprietary institution or bound by international quotas, natural growth is not counted as production, whereas the growth of fish populations in fish farms is. The latter is defined as production and consequently adds to GDP.[11] The same

logic is applied to forests, where old-growth or wild, uncultivated landscapes are excluded from the realm of production. Industrial forests are thus defined as productive. The extractive nature of the reasoning becomes distressingly tangible when the notion of productivity extends to the deliberate felling of trees in wild forests, which effectively constitutes an increase in the national income of a country. In short, it would not be an oversimplification to state that according to the SEEA, a benchmark of ecosystem services, deforestation is productive. What's more, these definitions are presented to us like the objects in Shamash's hands, incontestable.

And so, design, which has great influence in shaping the narrative and in enacting the capacity to measure and categorise, such as that bestowed by Hammurabi's stele, comes to the fore once again. It may be worth mentioning that we are writing this as we watch the American midterms unfold on the edge of our seats. And yet, even while fears of rigged elections subside and Trumpian rhetoric appears to lose steam as the statistics are periodically updated, we are steeped in percentages and visualisations that communicate a likelihood of narrative. As you mentioned earlier, Drucker reminds us that visualisations are an argument, and the graphs point to a shifting narrative. Perhaps (and we certainly hope this to be so) Trump no longer controls the narrative.[12] This notion of percentage, which holds so much weight in the sway and swing of states and, conceivably, democracy, begs a further consideration of centralisation, returning us to the immutability of blockchain.

10   United Nations. (2009). *System of National Accounts 2008*. United Nations Press, p. 7.
11   Fioramonti, L. (2014). *How Numbers Rule the World: The Use and Abuse of Statistics in Global Politics*. Zed Books, p. 111.

12   For an earlier impact analysis model of Trump's Twitter account during Covid-19, see: Pham, D. P. T., Huynh, N. Q. A. & Duong, D. (2022, December). The impact of US presidents on market returns: Evidence from Trump's tweets. *Research in International Business and Finance, 62*, 101681.

Entropy is facilitated by decentralisation. Certainly, this has been the case for language, standards, measures and worldviews. That said, the computing power of just a few sites is responsible for a large proportion of bitcoin production. Despite its decentralised ideology, mining is very much centralised.[13] This is, of course, reminiscent of Alexander Galloway's argument in Protocol: How Control Exists after Decentralization, where he challenges the simplistic ideology of the internet as a space of freedom by outlining the hierarchical and centralised nature of the Domain Name System (DNS) protocol upon which it is based. Despite the decentralised nature of the world wide web's protocol (TCP/IP), DNS creates a bottleneck that facilitates state control of the service, such as censorship or closure. Galloway reminds us that the technical protocols that scaffold institutional ecologies are far from neutral; they afford centralised intervention, which can advance the political and economic agendas of those who control the switch. Protocols constitute another tool for constraining mutability. Though blockchain allegedly cannot be manipulated, as protests unfold in Iran, we are reminded that a narrative can also be directed by wholesale bandwidth throttling or obliging a country's internet service providers (ISPs) to implement content-control software. Centralisation affords such possibilities, which is one of the reasons why underwater internet cables are so heavily guarded in areas where they are accessible. With all this said, and returning to your call to figure a community of practice and knowledge production that embraces its contingencies, could we think about entropy

13   A breakdown of the mining pool industry shows that it is mostly divided among four main miners: Foundry USA, AntPool, F2Pool and Binance Pool. See: https://btc.com/stats/pool.

through decentralisation as a way to sidestep dictatorial narrative re-writing or coercive scripts and distribution reminiscent of the calculi?

In Immutable, you trace a vital genealogy of the authority over standardisation and the role of reproduction in usurping the "divine objectivity" from what was once divine providence. We could have easily pursued our exchange with many more artefacts, building upon design's complicity in obfuscating instruments of power by constructing myths of neutrality (whether in relation to divinities or the technical apparatus). We have touched on so many points worthy of expansion: the standardisation of language actuated through print and nation-building, the sentinel's gaze of the EURion pattern, the forest made legible through orthographic projection, the management of "natural" resources that bridges standardisation and its enforcement, or the role of monsters in resource cartography. As a non-exhaustive list of our rich discussion spanning from NFTs to shipwrecks, perhaps these various unexpanded threads can gesture towards an overture that embraces contingency.

Chris Lee

It's true. There are so many more threads and tangents we could explore here! It could go anywhere, and we risk frustrating the reader who might have expected this discussion to follow a more familiar trajectory. "Offline", I think we both noted that this "conversation" felt improvisatory, and I've felt like what we've actually done is to put our respective "repertoires" of references into dialogue or play with each other. Hopefully, these will generate new tangents that resonate with readers' repertoires.

Against the linear-progressive modes of narration endemic to conventional histories – which is also how

the contingency of private property is stabilised
through contiguous evidence of provenance[14] – I'm
reflecting on the above as a kind of rehearsal for
the ways that we can write and read (scroll), remember
and narrate in non-linear ways, but also in ways that
enact or perform a critique of immutability, or at least
a deliberate embrace of contingency.

14 "The great enemy of property is oblivion, since the loss of conscious mastery over time and succession leads inevitably to the breakdown of property. Thus the forces of oblivion are antagonistic to the self and property, while all the techniques of mnemonics are their essential allies." (Caffentzis, G. (2021). *Clipped Coins, Abused Words, and Civil Government: John Locke's Philosophy of Money* (P. Rekret, Ed.). Pluto Press, pp. 53–54.)

Read in German