

FORUM

LÉVI-STRAUSS'S "THE MATHEMATICS OF MAN"

In a recent issue (Vol. 67, No. 2), we published a new translation, by Matthew Carey, of Claude Lévi-Strauss's seminal but often overlooked essay "The Mathematics of Man," which was originally published in French in 1956. As Susanne Kűchler suggested in her introduction to the text, Lévi-Strauss's insistence on seeing mathematics as more than just a means of quantification and statistical analysis should be of enduring inspiration to anthropologists interested in how models and other forms of patterned transformation operate within social and cultural life, as well as in how we attempt as anthropologists to gain an analytical handle on them. In continued collaboration with Kűchler, in the present issue we have invited anthropologists whose work speaks to these concerns to comment on the contemporary relevance of Lévi-Strauss's argument, encouraging them to be as explicit about the shortcomings and potential dangers of Lévi-Strauss's call to mathematics as they may be of its enduring insights and promise.

Keywords: algorithms, anthropology and mathematics, computation, Lévi-Strauss, structuralism, topology



STRATEGY AND STRUCTURE

Games on Gases

John Levi Martin

What a treat to have this important essay brought to light and translated! I believe that the significance of this short piece is not merely to boost the flagging spirits of those pursuing a distinctly mathematical approach to the social sciences, so that they may gird their loins to resume the arduous battle against inferential statistics, but to demonstrate Claude Lévi-Strauss's (hereafter CLS) complete acceptance that there was no incompatibility between the program he pursued and one grounded in action.

Let me start with the first. It was clear to André Weil ([1949] 1969) and Harrison White that the kinship structures examined by CLS were amenable to formalization in algebraic terms and that were, as White wrote in his 1963 contribution to the special symposium of the American Academy of Political and Social Sciences (AAPSS), 'Mathematics and the Social Sciences', "beautiful and powerful" (White 1963a: 83).¹ What White (1963b) had done was to treat prescriptive marriage rules as permutation matrices, themselves recast as elements of an algebraic structure. Each rule could be understood as a potential path from one lineage to another (FZD/MBS marriage thus being equivalent to telling male/female ego to marry a female/male from the same patriline to/from which his/her mother married—to "cancel a debt"). White and his colleagues (especially Boorman and White 1976; Lorrain and White 1971; White et al. 1976) then generalized this logic to revolutionize social network analysis, bringing a view of structure that was extremely generative.

But structure was not understood as antithetical to strategy.² As White (2008: 49n23) wrote elsewhere, game theory had tremendous potential to be a basis for social theorizing, and he considered it to be one of the great tragedies that rational choice theory had trivialized it. Indeed, there were a number of important studies regarding "games on networks" that paralleled some of the important work regarding "games in space" that Thomas Schelling (one of the few game theorists White respected) initiated.³

The idea, however, that structuralism à la CLS was incompatible with strategy and agency became widespread. Recognizing not only that actual marriages

were conducted for strategic purposes, but that the same dyads in small societies could be described using very different paths through a kinship structure, was taken to point to the limits of relevance of the structural model to the real world (a bit like saying that the George Washington Bridge shows you the limits of Route 95 to getting you to most of the United States from New England).

Now it may be that there are coherent theoretical approaches that decompose social life into what W. E. B. Du Bois called “lines of rhythm” versus “chance,” this latter Du Bois ([ca. 1905] 2015), like C. S. Peirce, identifying with freedom and will.⁴ Du Bois, however, understood that at any time human beings had the capacity for action and hence the responsibility that comes with that freedom. The rhythms they created were free ones, suggesting that it *had* to be possible to have a structuralist theory of action.

I think it is quite significant—and utterly correct—that CLS points to Louis Guttman’s work on scaling as “potentially revolutionary,” contrasting it to Paul Lazarsfeld’s seemingly more sophisticated and elegant probabilistic approach. The core Guttman scale—a set of items that have a deterministic rank, so that anyone who answers an item positively answers all “easier” items positively as well—seemed to most of the quantitatively oriented social scientists in the 1970s and onward to be ridiculously simple and implausible. But as CLS says, this was revolutionary because—despite its weakness for the task of population *inference*—it allowed the entrance of true mathematics.

The reason lies in the fact that—at least, as a first approximation—mathematics abhors *quantity*. As Don Martindale (1963) pointed out in *his* counterpoised contribution to the aforementioned AAPSS symposium, according to Bertrand Russell’s *Principles of Mathematics*, “pure mathematics is the class of all propositions of the form p implies q , where p and q are propositions containing one or more variables, the same in the two propositions, and neither p nor q contains any constants except logical constants” (1903: 3).⁵ This does not mean that there is no place for probabilistic thinking in mathematics (and certainly not that it cannot be used to *apply* mathematical thought—indeed, Jim Wiley and I precisely used Lazarsfeld’s work to apply a large class of algebraic structures that can be seen as progressive generalizations of Guttman’s approach).^{6,7} But what is generally referred to as “statistics” in most of the social sciences—what might uncharitably be defined as “a set of hallowed and moderately successful techniques for determining whether false statements moderately adequate to describe a set of poorly understood observations might be equally moderately adequate in describing a larger set of observations, were one to go to the trouble of gathering them, which one won’t”—rarely has much to do with mathematics.⁸

But there is a very different way of thinking about statistics (and one that, thanks to the combination of the adoption of Bayesian methods, on the one hand, and the remarkable increase in computing power, on the other,

is increasingly affecting the *avant garde* of social statistics), one that White (1963b: 94) gestured toward in closing his piece: “A statistical mechanics of modern society may be needed.”

The interesting thing about statistical mechanics is that it was actually initially inspired by findings from *social science*.⁹ The Gaussian error distribution that Adolphe Quetelet took from astronomy, and which now forms the basis of *inferential* statistics, had been heralded as a strong *theoretical* argument about large social formations. Analogically, it seemed appropriate to the case of gases, whose molecules were every bit as anonymous as soldiers being subjected to anthropometric scrutiny. The Boltzmann-Gibbs equation could be derived as a probabilistic distribution of overall states of an ensemble in equilibrium by renouncing any attempt to specify the exact momentum of any particular particle (a redundant expression, of course!).

This probabilistic approach has proven extremely useful in social statistics, which, since Nicholas Metropolis and colleagues’ (1953) algorithm, has realized that simulating the transitions between states can allow the solution of maximization problems that otherwise are nearly impossible—the key being that if a transition is made stochastically according to the *ratio* of probabilities of two states, then one need not construct the denominator of either probability, a task that would require somehow adding up over all possible states. These techniques became especially important for processes on networks or in space, as these may induce statistical nonindependence of a complex but specifiable sort.

In the simplest approach, there is a nonzero probability of a transition between any two states, even if it is extremely small. But structure, like logic, is about hard zeros—about what *is not* observed, and not just because you took a small, or slipshod, sample. What could account for such zeros? Imagine that the molecules had the sort of free will that Du Bois envisioned—a capacity, even if rarely used, to do what they choose—and that they are oriented to a technically noncooperative game.¹⁰ “Games on gases” may still be computationally formidable for us as a practical matter, but theoretical exploration of the sorts of *structured* constraints that can shape distributions (e.g., living on a two-dimensional surface versus not) might be an important way of developing the sort of mathematical social science to which CLS was pointing.

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Notes

1. Included were economics, political science, and sociology.
2. It is significant that Boorman's (2024) most recent work is on Sun Tzu!
3. Please remember networks and space, dear reader.
4. Actually, Peirce drove the very idea of will out of his vision of the soul! See Martin (2024).
5. I correct a major typographical error in Martindale's citation that might seem to introduce quantity!
6. A recent resumé of this work can be found in Martin (2023b).
7. Even more, this does not mean there is no room for number in mathematical thinking! As CLS notes, the differences between thinking in threes as opposed to thinking in fours have the greatest weight. Here one may see Martin (2024), a CLS-inspired exploration of the theory of action.
8. I do not deny that important findings have come from statistics; the one I think is the most compelling is the near universal overdispersion of errors (just that aspect of our data that conventional statistics encourages us to ignore): this is equivalent to saying "people are really different from one another in ways we do not understand." That's important!
9. For references, one may see Martin (2023a).
10. This means that they cannot transfer utility, only choose their strategy; allowing cooperation eviscerates game theory.

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THE MATHEMATICS OF MODELS AND THE MATHEMATICS OF MEASURE IN SOUTHERN CALIFORNIA

Nick Seaver and Bill Maurer

From the founding of the University of California (UC), Irvine School of Social Sciences in 1964, anthropologists were supposed to learn math. James March, the founding dean (who would go on to become a major figure in organizational sociology), had joined the campus from the Carnegie Institute of Technology in Pittsburgh (later, Carnegie Mellon), bringing with him its vision of interdisciplinary social science unified by a commitment to mathematics, formal models, cognitive theorizing, and computational methods (Kavanagh 2020). The undergraduate curriculum in the new school required math or statistics every quarter for the first three years of study—nine courses in math, minimum, before graduation. The first year also included a required “Introduction to Analysis” course, which was taught by March himself. This course turned into a textbook, coauthored with founding faculty member Charles Lave: *An Introduction to Models in the Social Sciences* (Lave and March 1975). A copy was given to every new faculty member who joined the school. The course and the book were mathematical in a formal, though not necessarily quantitative, sense: they taught an orientation to social phenomena that would permit their formatting into probabilistic models or computer simulations (Kavanagh 2020: 42). This was not a math of measure; it was a math of models. At least, that was how it all began.

In “The Mathematics of Man,” Claude Lévi-Strauss (1954) makes this distinction between the mathematics of measure and models, calling for a “qualitative” mathematics in the human sciences. Where the encounter between the social and formal sciences had largely involved techniques for quantitative measurement and statistical analysis—Lévi-Strauss points to demography and economics as exemplars—mathematical subfields like set theory, group theory, and topology offered the possibility of rigorously formal models that were not fundamentally quantitative.

A decade later, Lévi-Strauss's vision was (partially) realized in southern California. Doctoral students in sociocultural anthropology at Irvine would have a quantitative methods requirement through the mid-2010s; we were involved in the final years of this requirement as instructor (Maurer) and student (Seaver). In this commentary, we narrate the history of mathematical anthropology at the UC Irvine School of Social Sciences as a way to explore what happened when mathematical commitments like Lévi-Strauss's were put into practice. It is a story that involves interdisciplinarity, computers, and, eventually, the advent of machine learning.

The persistence of all this math generally takes contemporary sociocultural anthropologists by surprise. We tend to imagine that mathematical approaches to culture and society were constrained to the mid-century moment, banished from the field around 1973, the year Clifford Geertz published *The Interpretation of Cultures*. There, Geertz took aim at the “dark sciences” of structural linguistics and computer engineering, insisting that such formal approaches could only ever be “escapes” from the actual stuff of social life. He was reiterating points that had been made periodically over the history of the discipline (for instance, Bronisław Malinowski bemoaning the “bastard algebra” of kinship analysis in 1930 or Hortense Powdermaker worrying that computers would turn anthropologists into “technicians” in 1966; see Seaver 2015), but the rise of interpretive anthropology appeared to be a decisive moment. Ever since, the story goes, quantitative approaches to culture have been suspect and anthropologists have not had to know any math. But that same year, Michael Burton—then a junior faculty member in the school at Irvine—published an *Annual Review* essay on new quantitative techniques, asserting that “this review is written at a time of great activity in mathematical anthropology” (1973: 189) and pointing to an array of work on measurement and spatializing models for anthropological data. While most anthropologists were envisioning a fully qualitative approach to culture, others, like Burton, continued to explore the analytic potential of formal, quantitative, and computational tools.

March had founded the School of Social Sciences without departments, bringing together faculty trained in anthropology, sociology, economics, psychology, and education. His new school would be interdisciplinary, with “mathematics the universal language ... [and] history ... irrelevant” (Jean Lave quoted in Kavanagh 2020: 41). New computer technologies would be integral to research and teaching. As an announcement of the school's academic program stated: “The educational programs in the Division of Social Sciences ... are built upon the new social science of systematic observation, interpretation, and quantitative analysis of human behavior” (UC Irvine 1965–1966). Jean Lave, one of the founding faculty members, and at the time the wife of Charles, remembers her anthropological colleagues Duane Metzger and Volney Steffle

insisting that “all talk across disciplines must be in words of one syllable or at least directly intelligible. No fair retreating into citations of scholarship in your own discipline” (quoted in Kavanagh 2020: 50). Abstract algebra—a language of letters and symbols—went one better by not being syllabic at all.¹

Instead of belonging to departments, faculty elected each year to belong to one of three “Programs.” Program A was the “Program of Formal Models” or the “Program of Mathematical and Computer Models in the Behavioral Sciences.” Program B was “Language and Development.” Program C consisted of those who elected not to belong to either of the main programs. March allocated offices such that faculty members would not be adjacent to others with the same disciplinary training. One founding faculty member who left the school to form another remembered: “Interactions had to be so that there were no organizations by disciplinary focus above all ... if they moved in a direction of what some would call ‘responsible organization’, he [March] would oppose it” (Arnie Binder, quoted in Kavanagh 2020: 47).

We do not know if March was reading Lévi-Strauss. But in 1963, he published Harrison White’s *An Anatomy of Kinship* in his coedited book series *Mathematical Analysis of Social Behavior*, and the book reproduced an appendix written by the mathematician André Weil for Lévi-Strauss’s *Elementary Structures of Kinship* ([1949] 1959)—an algebraic group theoretic analysis of Murngin marriage laws. The first cohorts of faculty March hired at Irvine were definitely reading Lévi-Strauss: some, like the anthropologist John Boyd, extended Lévi-Strauss’s work on “marriage class systems” and the “kinship grammars” of Floyd Lounsbury with “abstract algebra,” that is, nonnumerical, formal models (Boyd 1969: 139). Others, like A. Kimball Romney and Burton, in conversation with cognitive anthropologists, would develop mathematical models for spatially representing the structure of local classification systems (Burton 1968; Romney and D’Andrade 1964).

These spatial models would become a signature technique of the Irvine anthropologists, providing a way to represent culture in a form that felt both intuitive and mathematically rigorous (see Seaver 2021 for a fuller account). They relied on a computational method, developed in the early 1960s at Bell Labs, called “non-metric multidimensional scaling”: where earlier versions of multidimensional scaling (MDS) required numerical measurements as input, nonmetric MDS could generate spatial models from qualitative (albeit formalized) data. This was a “breakthrough,” as Burton put it in a review essay, making it possible “to measure phenomena which have previously seemed too soft and elusive to express quantitatively” (1970: 42, 37).

These models of culture represented a different kind of modeling practice than Lévi-Strauss’s models of kinship structure. Where structuralist models of kinship were algebraic and austere, revealing simpler structures lurking beneath the apparent complexity of the social world, these new models of

cultural spaces moved in the opposite direction. Irvine anthropologists like Burton, Stefflre, Romney, and Boyd developed simple pile-sorting methods, in which respondents arranged tokens into sets (such as professions, medicinal plants, countries, or kinds of snacks). MDS models transformed this sparse data about qualitative comparisons into thick cultural *spaces*, which were imagined to be the cognitive stuff of culture: similarity and difference were treated as spatial qualities, as kinds of cognitive distance. The pile-sorting methods they developed, building on work in psychology, are still taught in some anthropological methods classes and are used more broadly in user experience research.²

Nonmetric MDS was computationally intensive. Unlike earlier techniques in mathematical anthropology, or the axiomatically mathematical approach envisioned by Lévi-Strauss, it could not realistically be done without an electronic computer. Spatial data treatments became the norm in machine learning—the development of elaborately quantitative models from qualitative inputs. Today, the descendants of such approaches to understanding social life are all around us, though generally not developed by anthropologists. If the models for the social sciences that March and his colleagues originally developed homed in on the “properties of relations that pertain between qualitative sets of data” (Küchler and Carey 2023: 84), as Lévi-Strauss had advocated, then the quantitative turn at Irvine and elsewhere eventually tended toward the kind of quantification associated with big data and machine learning.³

Attentive readers will have noticed the presence of Jean Lave in our text. A formative figure in the early days of the Irvine school, and a signal interlocutor for our own work, Lave was a steady, engaged critic of mathematical approaches to anthropology that abstracted mathematics from everyday life. At Irvine, she worked with real housewives of Orange County calculating in the supermarket and, later, Liberian tailors measuring sartorial and social fabrics, arguing that calculation (like cognition more generally) is a situated practice (Lave 2011). Lave, together with Jane Guyer, Helen Verran, and others, offered an entirely different approach to mathematical reasoning that situated it always in cultural contexts, and that saw it as open to alternative systems of numeration, counting, and, yes, measure.

Revisiting Lévi-Strauss’s mid-century vision of a new relationship between anthropologists and mathematics provides an occasion to reconsider our disciplinary common sense about what to do with number, formalism, and computational methods. In our own anthropological trajectories, finding new ways of thinking about calculation has opened up theoretical avenues that, while not strictly mathematical, suggest more generative and less dismissive modes of engagement. For Maurer, reading math ethnographically in the manner of Lave was a lifeline during quantitative anthropology’s final days at UC Irvine. For Seaver, discovering the lineage of linear algebra provided a throughline

to the anthropological analysis of the algorithms that surround us. And for Lévi-Strauss? Perhaps he would find some solace in the fact that the critical qualification of quantification still provides options beyond measure for a human mathematics.

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Notes

1. See, for comparison, Edmund Leach on the usefulness of algebra in *Rethinking Anthropology*: “The merit of putting a statement into algebraic form is that one letter of the alphabet is as good or as bad as any other. Put the same statement into concept language, with words like paternity and filiation stuck in the middle of it, and God help you!” (1961: 17).
2. See <https://www.nngroup.com/articles/card-sorting-definition/> (accessed 1 October 2024).
3. In a fascinating discussion of Lévi-Strauss’s mathematics, Mauro Almeida (1990) discusses the distinction he made between mechanical models and statistical models as two types of “machines,” one of which “keeps the door shut” and the other of which “keeps the door open” on a range of formal and social possibilities (375). Interestingly, one of the commentators on this article was Paul Jorion, a coauthor of UC Irvine quantitative anthropologist Douglas White, both of whom in their publications acknowledge personal communications and support from Lévi-Strauss and Edmund Leach.

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PAIRED BROTHERS OF IATMUL AND THE “MATHEMATICS OF MAN”

Andrew Moutu

Claude Lévi-Strauss proposed an analytical method that privileges the qualitative over the quantitative application of mathematics to social and cultural life: “What we can learn from this new mathematics is the reign of necessity is not necessarily coterminous with that of quantity” (Küchler and Carey 2023: 93). While this leaves us wondering what he might have meant by “the reign of necessity” (physical, logical, or metaphysical), his vision implicates the kind of intellectual freedom of analysis that can be elaborated with relevance, subtlety, and a care for scale and complexity.

As Lévi-Strauss explains in his seminal article, his approach to such a qualitative mathematics was drawn initially from an understanding of kinship and marriage systems. Marriage is not an arithmetic performance of addition and subtraction. If marriage systems are understood as a relation between a finite set of classes, and the relations between those classes are stable and determinate, then the rules of marriage in a society can be transformed into equations and be analyzed with the same rigor of established mathematical methods.

In the anthropological studies of Melanesia, however, the qualitative mathematics envisioned by Lévi-Strauss has echoes that resonate across social and cultural life. For example, it is exemplified in the cybernetic feedback loops of the Naven ceremony described by Gregory Bateson (1958); in various permutations of counting systems (e.g., Mimica 1991); the tracing of graphs in sand drawings in Vanuatu (Ascher 1991); the ideas of the fractal person and holographic worldview theorized by Roy Wagner (1991, 2001); fractals and mero-graphic relations theorized by Marilyn Strathern (1991, 1992, 2018); and the order of chaos discussed in the volume edited by Mark Mosko and Fred Damon (2005). These few examples provide ethnographic and theoretical content by which the mathematics of man might be proved or elaborated.

Indeed, beyond the specifics of Melanesia, we might say more broadly that if the foundation of mathematics was born of numbers, then numbers, like languages, were conceived of man. Wherever and whenever we encounter the proliferation of human social life and culture, numbers abound in a certain

measure of intrigue and complexity. Whatever their origins and orientations, numbers weave an enchanting spell in and across the cultures of the world.

In my own work in the Sepik region of Papua New Guinea, the idea of such a mathematic appears in the Iatmul notions of a pair of brothers, an “elder/younger brother” (see Herle and Moutu 2005; Moutu 2013). Paired brothers appear extensively in various permutations, including for example, in the form of intergenerational sibblingships, inter-clan lineages, villages, moieties, houses, musical instruments, birds and trees, earth and sky, as well as in the pairing of names and in nouns.

The pairings of these kind are also evident in the Iatmul vigesimal counting system. The enumeration is based on five and twenty, which take their line of counting from the interdigitation of fingers and toes such that a pair of hands with ten fingers and a pair of legs with ten toes together make the person “one wood.” The enumeration unfolds as a process that makes the one out of a pair and is extended or completed by yet another pair again (see Strathern 2021).

This sense of pairing might convey an aesthetic of symmetry. But as we can recall from Bateson’s (1958) theory of schismogenesis, the idea of pairing in Iatmul is premised on an alternating asymmetry of active and passive enactments of social relations that afford the view that asymmetry must be as intrinsic to time as symmetry must be to space. Thus seen, Iatmul preoccupations with and celebrations of the number two, manifest in the pervasive appearance and operation of pairs in Iatmul social relations, recall the foundational role given to the number three in Hegelian dialectics. This too, we might say, is a human mathematics that not only holds up and resolves contradictions or oppositions, but also makes them compatible with emerging forms of identities and/or differences.

Iatmul paired brothers and Hegelian dialectics, then, can be seen as cognate formations of the mathematics of man played out in a temporal frame. But this suggests an analytical comparison with potentially far-reaching implications: what difference might it make to think of the dynamic unfolding of relations in terms of the two-based mathematical possibilities that Iatmul pairings point to, as compared to the three-based movement of the familiar model of Hegelian dialectics? And more broadly, what kind of mathematical knowledge might emerge from the alternating power of the “pairs” asymmetry in time?

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ON MYTH AND MATH

Knut Rio

In her introduction to the article by Claude Lévi-Strauss, Susanne Küchler guides us into the many pitfalls of applying calculus to human worlds. She joins Lévi-Strauss in his attempt at formulating a “human mathematics” designed for understanding better social structures and cultural patterns (Küchler and Carey 2023). The question of how to build models becomes crucial—whether by counting and synthesizing observed data or, as Lévi-Strauss suggests in his example of marriage classes, to instead create models by rethinking social categorizations and the relation between them. He proposes attention to sets of small numbers, and we can see how this accords with the trendy mathematical models of set theory that he refers to in 1956, to which his example of marriage classes refers.

Here we are, almost seventy years later. Küchler articulates well the directions followed in anthropology since then. In her final comment, she links this effort to what she calls “indigenizing anthropology.” This will be an attempt to join hands with perspectives from elsewhere than the centers of science. It does not imply “finding” mathematics in Indigenous practices, but to instead rediscover mathematics in other forms. I go along with all her points but will elaborate on one issue that is perhaps missing from Lévi-Strauss’s account of human mathematics. This has to some degree to do with his work after *The Elementary Structures of Kinship* from 1949 and after *Totemism* and *The Savage Mind* from 1962, all three books having very much to do with his 1956 essay on mathematics. These books had, in short, been treatments of social groups as sets of terms and the systematic relations created by human categorization. He was later upset when critics found his approach too mathematical (1981: 634). After that, he continued with a massive body of work on mythology. I do not think one could say that he broke with human mathematics, since algebra, set theory, and binary operators of mythological elements continue to give guidance to his work, but a new direction is given by the sheer mass of mythological descriptive materials. At the end of it, he also relinquished the idea that the study of myth should be as easily assimilated to mathematics as the study of kinship (1981: 635). We can perhaps deduce from his later publications, and its offshoots like Gregory Schrepp’s (1992) work, an interest in a mathematics

“otherwise,” if we follow that lead by K uchler into Indigenous worlds. My little issue here will therefore concern how mythology can be a critique of mathematics, by not accounting for what there is but what there could have been.

When one applies mathematics in a straightforward way in natural or social science, this has often to do with accounting for observable relations between discrete elements out there in the world, such as number of salmon swimming up a river to spawn, measuring the ratio between red and white blood cells, annual yield of rice in a field etc. In mythology, by contrast, counting and measuring take a different meaning and provide in this sense a “counter-mathematics.”

Let me provide one short example from the book *Magical Arrows* by Schrempp (1992: 18–19). He discusses at length the Greek story about the race between the runner Achilles and a tortoise. Even though Achilles is much faster than the tortoise, he can never catch up with it, no matter how fast he runs. The tortoise got a head start and for every distance that Achilles catches up with, the tortoise has again moved ahead. Even though the distance between them becomes infinitely smaller and smaller, the story details a problem that is seemingly real. The story challenges mathematics by manipulating the parameters of measuring time and space. It renders time and movement differently, so that a continuous race of different speeds becomes a material, inert line cut into pieces. Schrempp details how mythology thereby poses questions to our notions of perceived, experienced reality (1992: 28). There have recently been efforts to take inspiration from such tendencies in mythological (or fictional) thought for questioning the necessity of physical laws, like in Quentin Meillassoux’s (2015) critical realism.

But let us get back to the ethnography and a slightly different outcome from new materialisms. What L evi-Strauss gets from the American Indigenous mythology is that the visible discontinuous world is only a momentary eclipse of the non-categorized world. In cosmogonic myths we always move from an original continuity (between heaven and earth, sun and moon, humans and nonhumans, man and woman, etc.) and toward the separation of the world into discrete elements. A universal predicament, for all people, seems to be the pressing realization that the world is in reality continuous and infinite, but as humans enter into the world, they are only given bits and pieces of this infinite totality. Counting and accounting for visible things is only a very limited part of accounting for mythological totality. In short, myth comes before math.

Such a view can also be supported by the ethnography of divination, as in the accounts by Ron Eglash (1997), Marcia Ascher (2002), and Knut Graw (2006). In divination, things are picked up from their apparently random and insignificant belonging inside undistinguished forms of “nature”—such as water, shells, pebbles, bones, and sand. The diviner now gives them meaning as separate entities and puts them into motion through calculus, combination,

and pattern. From this recompositing of materials and alternative mathematics, all sorts of truths about human circumstances, past and future, emerge. Arguably, the work of the diviner goes beneath the numbered visible reality of things and instead finds new relations among unnumbered things. The diviner in Vanuatu, for instance, looks into a bowl of water and splits the water in two with a knife (see Rio 2013).

Ultimately, these accounts from the ethnography of myth and divination reveal an intense dynamic between the zero and the one. In mathematics, it has become commonplace to delegate that dynamic to a digital logic where the alternation between zero and one becomes code for sending messages. But in mythology, the shift from zero to one stands for the cosmogonic moment of a continuous world becoming discontinuous and plural. As noted by Schrempf in his long commentary on mythological cosmogony: “A first separation is attained, and immediately the cosmos fills up with separation” (1992: 96). To illustrate the point, we can take a glimpse at a story about the beginning of life told by the Inuit Apákak to Knud Rasmussen in northern Alaska in 1921. The first life forming on earth was Raven, Tulungersaq. He was there in the darkness when he suddenly became aware of himself. Everything around him was dark, and he could see nothing. Then he felt his way with his fingers, and he felt the shape of the cold earth, and everything around him was inert, lifeless. But by feeling his way with his hands, he found his face, nose, eyes, mouth, arms, legs, and body. Now, he became aware of himself as one entity apart, not tied to his surroundings. He was a human being, alone in the darkness. But one day he found a sparrow, and from that moment, he created all beings, as well as night and day and the underworld and the heavens (Rasmussen 1929: 34–40).

Inside the darkness of the pre-world, there is nothing but also everything. Raven stands out first, with its complete blackness as its founding capacity, but creates, by mere awareness and intention, the human being and everything else that comes with it, including mathematics. But what would the mathematics of Raven be like, if not a mathematics of small numbers as suggested by Lévi-Strauss, from zero to one, and then the little sparrow accounts for everything else.

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FROM “THE MATHEMATICS OF MAN” TO THE MATHEMATICS OF OTHERS

Alonso Rodrigo Zamora Corona

In general, the impression that arises from Claude Lévi-Strauss’s “The Mathematics of Man” (see Küchler and Carey 2023) is that what is interesting about mathematics and science in their relationship to anthropology is not modeling per se, nor the possibility for epistemological reduction (transforming anthropology into a “hard science”), but rather the potential for comparison that arises in the interplay of both disciplines. While theoretical modeling in anthropology must remain a task for anthropologists themselves, comparison across disciplines is possible and can yield fascinating results. Such an approach harkens back directly to Lévi-Strauss, who, in a significant passage from *L’Homme nu* that tends to be overlooked, wrote that “structural analysis ... can only appear in the mind because its model is already present in the body” (1981: 692), sharply differentiating himself from what he called “structuralism-fiction” (1981: 641), that is, the sort of idealistic approach to structural analysis that is often associated with postmodern thought.

Indeed, Lévi-Strauss, in contrast to the common view about him, was always confident that his own thought was not an idealism, but a materialism, not in the sense of a simplistic determinism, but in the sense that, in his own view, certain properties of physical, natural, and social systems can be compared across different levels of organization of what is, in the end, always matter, and that we as humans are not different in an absolute way from any other level of organization of the universe, only possessing a particular complexity, and that, in consequence, certain epistemological strategies and conceptions can be applied in many disciplines, including mathematics, natural sciences, or even linguistics, as he himself did in his analyses of non-Western societies, mostly inspired by linguistics. As mentioned above, this recurrence of “structures” across different levels of organization of the universe does not mean that they are deterministic in nature but rather that they are possible across levels. For example, the fractal structures recognized by Marilyn Strathern ([1991] 2004: xx–xi) as arising within the social are not a deterministic consequence of the “fractal geometry of nature,” to use the famous title of Benoit Mandelbrot’s

(1982) book on fractals, but rather fractal structures are comparable in their manifestation across levels of material organization, which are in the end epistemological levels. This is what Lévi-Strauss meant when he said that homologies between human sciences and natural sciences were not substantial but formal (1981: 643). In my opinion, Lévi-Strauss was right in his assertion regarding a “materialist” structuralism: Strathern could see fractals in social life because there are fractal geometries in nature and because comparison across levels is possible but not because they are the inevitable, deterministic result of a hard-coded natural dynamic, nor merely because they are purely interesting mathematical ideations.

Regarding his passion for mathematical modeling, Lévi-Strauss stands in an interesting place: for anthropologists, many of his models and generalizations are too mathematical and abstract in nature, but for some of those trained in mathematics, like the anthropologist Robert Jaulin, one of his fiercest critics, his models lacked mathematical rigor (Lanternari and Di Paolo 1985: 231). However, a lack of “ultimate” rigor, if that is taken to connote some form of mathematical reductionism, can be seen as a strength: it means that his theorizing remained anthropological and that the usage of mathematical symbols and relationships, as weak as they may seem for some mathematicians, were a means to elucidate problems through a perspective that remained essentially anthropological. They are analogous to Karl Marx’s usage of differential calculus to understand capitalism (cf. Damsma 2019): the structure of many of his formulae was indeed mathematical, but the concepts involved and elucidated through them were not mathematical but economic and social. Again, this is something that a serious reader of Lévi-Strauss should not forget: the “mathematics of man” that pervades the work of Lévi-Strauss in proposals such as the “canonical formula” (Santucci et al. 2020) is a reversal of sorts of the usual roles of mathematics and anthropology (and other disciplines in general) of the kind that he invokes when recalling the example of the socio-statistical work of Louis Guttman (1954).

For example, regarding my own ethnographic work, which certainly has found inspiration in Lévi-Strauss, when faced with the task of explaining how the cosmology of present-day Maya in Guatemala works beyond the usual ethnological topics about them (concepts such as “worldviews,” “spirits,” “gods,” and “rituals”), I was drawn to scientific conceptions such as emergence (Holland 1998), downward causation (Campbell 1974), and Douglas Hofstadter’s (1979) “strange loops,” not in order to achieve a scientific reduction of Indigenous cosmologies within those conceptions but rather to infuse our understanding of cosmological processes beyond the usual anthropological conceptions. I wanted to show how Indigenous cosmologies are “futuristic” in a way, that they are not merely archaic representations to be reduced by our own exoticizing, “primitivizing” anthropological categories. Indeed, classical

anthropological categories tended to contrast the “irrational” although socially “functional” ideas of “ritual,” “religion,” or “magic” to our own “scientific” and “positive” ideas that analyzed them. Instead, I wanted to show that Indigenous conceptions are compelling and complex insights on which certain stumbling blocks of social theory, such as the relationship between “function” and “modeling,” are already overcome through complex theories that involve both quantitative and qualitative reasoning.

Anthropology is a science both of comparison across cultures and within cultures; on the other hand, math, while being a formal discipline, has become the main “tool” to achieve comparative reasonings across levels of nature. Despite their differences, the potential for comparison is an important feature of both, and I still believe in the fruitful character of the relationship of both disciplines. However, we can go even beyond the productive but somewhat still too Westernized relationship between anthropology and math when we realize that “the mathematics of man” is not merely the mathematics of the West but the mathematics of others. Indeed, mathematics and mathematization are not an intellectual patrimony of Western culture but rather a phenomenon that arises among cultures to formalize and model their own comparisons, the math and astronomy of the Maya or the Aztecs being famous examples—but not the only ones. A stunning quote by the controversial polymath Oswald Spengler comes to mind here, when he remarked that the boomerang among Australian Indigenous peoples was not merely a functional invention product of chance or necessity, but something that was only possible because of a powerful and not yet completely understood Indigenous interpretation of space, what he called a mathematical “instinct” (1945: 58), or, as we may affirm today, a product of *another* science, of *other* maths.

Indeed, in recent times, and thanks in no small measure to the so-called “ontological turn” (Holbraad and Pedersen 2017), the tendency of many Indigenous cultures to create innovative cultural comparisons across levels of being have come to the forefront. In general, Western science tends more toward “material” and reductionist comparisons often grounded in the artificial and in what Lévi-Strauss characterized as an “engineer” mentality (1966: 16–36), arising specifically through scientific modeling across natural phenomena. In this respect, I think that we are still lacking an understanding of the relationship between mathematics and ontology in other cultures: how comparisons are achieved through numbers and patterns. As it is well known among Mayanists, for example, the complex calculations of the Maya regarding the apparition of celestial bodies were not merely mechanical in nature: they were ontologically grounded in a vision that considered heavenly bodies such as Venus to be powerful celestial hunters, and were formally grounded in calendrical structures rather than in “pure” mathematics only (Thompson 1972: 62–71). Thus, we are still lacking an understanding of the mathematics behind these Indigenous

comparisons, how what we perceive as formal and as ontological are interrelated in the world of others.

Anthropologists should be fine-tuned to understand the ways in which epistemology is realized in different cultures and what others seek to do with them, and of course we must understand how far we are from a true understanding of other epistemologies. In that regard, for me, as an anthropologist, Western math and physics are as interesting and as valid a material to think about and with as non-Western mathematics, epistemologies, and ontologies are, and this anticipates, of course, the ultimate lack of validity of the "West vs. rest" dichotomy. Lévi-Strauss evoked this state of affairs when talking about the "mathematics of man" of the future, a nonreductive, qualitative mathematics, maybe a return to the general mathematical program of humankind, rather than just that of the West. Thus, now that the tendency of understanding others through the lenses of a reductionist Western knowledge has been generally rejected, we need to understand other epistemologies, the maths of others, if we are truly to understand the human tendency to know in itself. Lévi-Strauss thought, in a pessimistic manner, that this was ultimately impossible for humanity as such, and alluded to this future state of affairs when he talked about humanity and its myths as a voice or a song preceded by and ended in its own silence (1981: 695), but I often think that the end result will be simply another sort of music not yet understood or heard by us, rather than merely extinction, as he tragically envisioned.

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THE DANGERS OF EXTRAPOLATION

Toyin Agbetu

In “Les Mathématiques de l’homme” (1956), Claude Lévi-Strauss rightly calls for a revolutionary synthesis of mathematical methods with contemporary approaches to researching culture. However, his arguments mask a problematic approach that can result in harmful outcomes if applied uncritically to influence real-life processes. Lévi-Strauss’s idea asserts that all the rules of a social system *can* be made into equations. Derived from his structuralist beliefs, this desire for a qualitative form of math is based upon identifying what Lévi-Strauss recognizes as the “essential properties of qualitative wholes.” It is a laudable aim, yet one fraught with danger.

I suggest this as Lévi-Strauss seems to be advocating for a solution based upon fractal, not human, mathematics when seeking to identify a numerical-based method capable of explaining the intricate nature of structural transformations within society. Despite his kind nod to the preoccupation of precolonial societies and Indigenous thinkers with deciphering the value of numbers, Lévi-Strauss provides an interpretation of human culture, structure, and behavior that appears clouded by the power dynamics of “whiteness” inherent in a system from which he derives privileges. It is important to note that he was also part of an academic body that accepted the validity of “race” as a construct with genetic and cultural linkage (Lévi-Strauss 1952: 5–7).

Lévi-Strauss’s proposal seems to seek refuge in the ability of fractal mathematics to extrapolate *upward* and exhibit self-similarity across different scales. We see this when the mathematician Benoit Mandelbrot used fractals to model the financial market (Mandelbrot and Hudson 2006), and scientists model biological structures like blood vessels (e.g., Gabryś et al. 2006). At first glance, Lévi-Strauss’s call for a quantitative process capable of reducing the key attributes of a “very small” set of people into a form with logical-mathematical properties is an efficient approach. Moreover, it appears to be an attempt to escape the despair and potential tyranny of “big numbers.”

Yet, while this can work when depicting social structures in topological and spatial forms, this or any other algebraic approach cannot produce a model that represents the reality of human experience and diversity. For example, in

ignoring the nuance of social interactions at both the micro- and macro-levels, as his suggestion infers, such equations cannot accurately capture the essence of human structures and relationships that are context-dependent, especially those influenced, transformed, and destroyed by acts of violence from external sources like colonization (Smith 1999).

Lévi-Strauss's approach seems primarily based on the idea that numbers and formulas are descriptive and that all aspects of human cultures have shared relationships and systems that can be analyzed, identified, and codified. However, this becomes an attempt at what software developers call "reverse engineering"—that is, observing a phenomenon and creating a new, sometimes more "efficient," alternative system that can reproduce a similar outcome despite not understanding the intricate processes that led to the original's existence, let alone its latent capacity and potential for growth through adaptation.

In extrapolating *upward*, I suggest that no truth is discovered, as humanity's "incommensurable" and "ineffable" character cannot be revealed by facsimile. Instead, while this additional intellectual abstraction of our anthropological observations may assist with our comprehension, it distances us from sharing and experiencing humanistic truths, at least holistically. Therein lies the first problem: in seeking a mathematical formulation of any human phenomenon, we are almost guaranteed to render human behavior, emotions, and social dynamics that are inherently nonlinear in an oversimplified manner. The likely result is the reification of any invisible, preexisting systems of structural violence (Farmer 2004).

However, the second problem with Lévi-Strauss's ideas is far more serious and involves the dangers of extrapolating *downward*—that is, despite his best intention in arguing for a "qualitative math" based upon set or group theory, his call for an "algebra for the human sciences" can simultaneously be construed as an endorsement of the dangerous representation of "stats as facts." Of course, Lévi-Strauss would argue against this and is correct when claiming that in "studying the possibilities and constraints that attach to the number of participants of very small groups ... [there is a role for finding a form of equation]" (1956: 533). As a discipline, this form of extrapolation and theorizing of our ethnographic data is at the heart of how our inquiries are broadly interpreted, especially by those who do not regard anthropological studies as an extension of colonial activity.

Yet, in adopting this approach we would be validating the worst traits of the new mathematics that Lévi-Strauss warns against when applying statistical techniques to large populations. We see this in today's practices through algorithmic technologies that draw upon immense datasets populated with human-produced content and biometric measurements to provide social, commercial, and governmental services (Henley and Booth 2020). Moreover, it is not human-centric anthropologists who decide when the "intimate nature of

the studied phenomenon ... is beyond reason and can even remain completely ignored" (Lévi-Strauss 1956: 532), but software developers and private companies in thrall to the allure of quantitative certainty through dehumanizing statistical analysis.

When Lévi-Strauss asserts that the "reign of necessity is not inevitably confused with that of quantity" (1956: 532), he forcefully reminds us why anthropology must avoid reliance on statistical analysis as a panacea capable of delivering our observations in a more rigorous form. His words are a powerful rebuke to the theories of Francis Galton, who, in the late nineteenth century, advocated the harmful pseudoscience of eugenics and utilized human mathematics as a tool to establish the field of forensic science. Yet, who defines necessity? I ask this question because Galton's (1904) desire to prove his utopian "racialist" ideas simultaneously perpetuated the myth of genetic superiority.

Galton's fondness for using mathematics to substantiate his arguments was only matched by his willingness to selectively include data that was compatible with his beliefs. In his 1857 essay exploring the nature versus nurture debate through a study of twins, he writes: "We have only to take reasonable care in selecting our statistics, and then we may safely ignore the many small differences in nurture which are sure to have characterised each individual" (Galton 2012: 576). This example from the past warns us that applying algebra to solve human problems does not always result in neutral, ethical decisions.

In the twenty-first century, there is a tangible threat of a digitally enabled form of eugenics-styled research returning. Mirko Bagaric and colleagues (2020: 32–38) outline how racism has been a structural problem within the COMPAS system used by American courts in decision-making processes about sentencing. In the United Kingdom, a similar reliance on algorithmic processing in the Horizon IT scandal has resulted in hundreds of innocent sub-post-office operators being convicted and some being jailed (Sweney 2024). It is this reductive approach to data and confidence in its piety in human matters justified by the outcomes of mathematical equations that has resulted in violence occurring against vulnerable and innocent people. Andrew Prahll and Lyn van Swol indicate that this occurs because "humans generally expect automation to be "perfect" (i.e., with an error rate of zero), whereas a human is expected to be imperfect and to make mistakes" (2017: 693). Prahll studies the replacement of humans with various forms of automation, including algorithms.

Lévi-Strauss's error is in presenting mathematics as if it exists outside human mythmaking and systems of coercive power. Indeed, mathematical systems can be and are abused to ensure that numbers lie, even if only for aesthetic and/or commercial reasons. Consider the bias inherent in global perceptions of time and space, best illustrated in the contradictions of the Gregorian calendar system (Abu-Shams and González-Vázquez 2014) and the political distortions within the Mercator projection. As a decolonial scholar, I would argue that it

would be a gross error to assume that we can use the same methodological toolkit as the natural sciences to render social and cultural phenomena. Doing so to later extrapolate and assert some form of generalized truth about the behavior, cultural values, and structural composition of any small-scale “community” would constitute a dehumanizing act of epistemological violence.

In the opening of his essay, Lévi-Strauss reminds us that Plato was concerned with the relevance of mathematics to the human condition. However, in seeking meaning in the metaphysical that transcends mathematical depictions of logic, we also need those poets that Plato wanted out of his republic (Cooper 2019: 14–16). Hence, while I agree with Lévi-Strauss’s proposal for anthropology to adapt and imbibe new mathematical and even computational approaches, we must be wary of any assertion rooted in positivist rhetoric that professes that the inclusion of quantitative data in our studies improves rigor. This is a fallacy.

Much like any other language, mathematics is shaped by power dynamics and influenced by rules, biases, and exclusionary practices, especially when faced with constructs it does not understand. Fortunately, we have options. Kristoffer Albris and colleagues (2021) demonstrate how, with adequate training, datasets can be created from field notes that retain the qualitative depth of their source material while still allowing for the analysis of quantitative trends over time. Such approaches are obvious prerequisites for our discipline if we are to continue producing innovative, ethical research relevant to today’s digitally enhanced world without causing harm.

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Notes

1. “The mathematics of man”
2. This is not a personal attack but more an observation of Lévi-Strauss, who also wrote: “There are many more human cultures than human races, since the first are to be counted in thousands and the second in single units.”
3. “En étudiant les possibilités et les servitudes qui s’attachent au nombre des participants de très petits groupes ... des propriétés logico-mathématiques bien définies s’attachent en effet à ces choix”
4. “alors que la nature intime du phénomène étudié ... est hors de cause et peut même rester complètement ignoré”
5. “le règne de la nécessité ne se confond pas inévitablement avec celui de la quantité”
6. Correctional Offender Management Profiling for Alternative Sanctions

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MATHEMATICAL MOMENTS

Sarah Green

As an anthropologist specializing in bits of Europe (the United Kingdom, the Greek-Albanian border, the Aegean, the Mediterranean), I have regularly noticed that mathematics has been both ubiquitous and obviously had considerable power in European thought. My interest began with statistics, which is the branch of mathematics that Claude Lévi-Strauss refers to when he writes critically about quantitative uses of mathematics in the social sciences. During my research on the Greek-Albanian border, statistics were everywhere, and they held particular power: a population census determined how much funding a village would receive; a census of sheep and goats would determine levels of European Union (EU) subsidy for pastoralists; comparative income statistics would determine whether the region of Epirus, which makes up the northwest corner of mainland Greece, would be classified as sufficiently below the EU's average income and therefore warrant special support from the European Regional Development Fund (ERDF) (Green 2005).

I myself collected enormous amounts of statistics during that research. I went through decades of records of livestock, beehives, and crops for the areas I was focusing on. What I found was repeated efforts by civil servants entering the data to somehow fit the official classifications into actual encounters with people and their sheep, goats, and chickens. For example, I remember seeing a note in the margins of a records book from the 1930s that stated the residents of a particular village were away during the livestock census. This explained how the village appeared to have almost no livestock in that year whereas there were many thousands of animals recorded for the year before: the census for this year was taken during the summer, once the residents, who were transhumant Vlachs, had moved up the mountain with their animals to the summer pastures. Speaking to people in the villages, I became aware of constant efforts to ensure that the official statistics reported what people living in the area thought was fair, rather than any efforts to ensure technical accuracy. For example, the heads of villages regularly bused in former residents who now lived in Athens or elsewhere for the day of the population census, to ensure enough funding for the village to survive.

These ethnographic encounters in Epirus led me to look into the history of statistics and its uses. The results suggested that the development of statistical techniques was inextricably interwoven with the development of the modern nation-state, a history that is embedded in the word itself: “stat-istics,” science of the state (Cohn 1990; Goldman 1991; Hacking 1981; Holt 2000; Urla 1993). There was nothing objective about statistics; there was no view from nowhere that could provide an account of statistics that was free of the ties that bind it to a particular set of historical, political, and geographical particularities.

That in turn made me alert to the possibility that mathematical thinking could be seeping into all kinds of elements of social life without being noticed. Having been an anthropologist of gender and sexuality for many years, I was aware that whatever is socially ubiquitous tends not to be noticed, simply because it is everywhere all at once, which makes it hard to see. That phenomenon is certainly clear in Lévi-Strauss’s essay: from a contemporary standpoint, it was jarring to read Lévi-Strauss’s unreflexively masculine phrasing, despite knowing that this was normal and unquestioned at the time he wrote the piece.

In any case, the implication of this is that the branch of mathematics that Lévi-Strauss identified as the quantitative use of mathematics in the social sciences—i.e., statistics—was always intended to be used by the social sciences as a means to gain knowledge about the people of the state and about the state of the people. The failures that Lévi-Strauss identifies in the use of these techniques for other purposes, such as understanding topics about human behavior and relations that are not easily quantifiable, was not the original point of that branch of mathematics.

To be fair, Lévi-Strauss quickly passes beyond statistics to focus more on the branch of mathematics that he suggested anthropologists and other social scientists should actually train themselves in. Again, he does not explicitly name that branch, but it is obvious he is speaking about set theory. He briefly mentions set theory on page 94, and includes it with group theory and topology, even though all the examples he uses in the text suggest that he is referring to set theory, which is the study of sets of objects and the rules that govern their intersections. It is hardly surprising that this branch of mathematics should have attracted Lévi-Strauss’s attention: he was the founder of structuralism, which specializes in classification systems and how meaning is generated from the rules underlying them. Language, music, myths, and scales of all types—structuralism looks at the formal rules by which the elements are related, separated, and combined generate ways to make coherent sense out of a world full of incompatible things.

That was not all, however. Lévi-Strauss also had a more tactical interest in encouraging anthropologists to pursue set theory. He writes that the social sciences and humanities “have long aspired to mathematical rigor” (93) and that “it is clear that the coming generation of social scientists will require a solid,

modern mathematical education if they are not to be swept aside by the progress of science” (97). What Lévi-Strauss is revealing here is something important about his own historical and social context: those academic disciplines that could do mathematical things with their data were assumed to be more rigorous and implicitly more important and more valid than those disciplines that did not.

All of this implies that another way anthropology could engage with mathematical thinking than that suggested by Lévi-Strauss would be to study the meaning and value placed on the form of mathematics being used in any particular ethnographic context. In her introduction, Susanne Küchler offers some excellent ethnographic examples of how peoples around the world make meaning through a range of different forms of mathematical thinking that are specific to them (Küchler and Carey 2023). Both my proposal and that of Küchler offer something different from the main message of the essay, which was to adopt set theory as a form of anthropological analysis. And it might indeed be worth looking again at that idea, not least because of its emphasis on intersections and as a means to make incommensurable and incompatible things discussable, without necessarily directly comparing them. At the same time, it would also be worth looking at both the historical and contemporary value of the different fields of mathematics: the way that they are deployed, visibly or invisibly, in people’s lives and, in particular, how different branches of mathematics are deployed in the operations of power. From that perspective, it is more than a little ironic that this text, which is full of unreflexive masculinity, was advocating the use of set theory, which specializes in intersections, as the form of mathematics that is most compatible with anthropology, given that it is through feminist scholarship that the term “intersection” has been adopted in the social sciences. It is worth noting here that the word “Man,” when used to refer to both men and women, as is the case in Lévi-Strauss’s essay, is an example of a set theory paradox known as Russell’s paradox: the complete set called Man contains both men and women, which means that it includes objects that are man and not-man. Russell’s paradox suggests that, if a set contains members of itself that are also not members of itself, there is a logical problem: if the object is a member of itself, then it must meet the condition of its not being a member of itself. But if the object is not a member of itself, then it precisely meets the condition of being a member of itself.

This brings me to my final point, which concerns how to think about the ubiquity of digital mathematics in the twenty-first century. The mathematics behind developments in artificial intelligence, machine learning (which Lévi-Strauss mentions), and translators like Google Translate and DeepL are mostly invisible. At most, there is talk of an algorithm, and this algorithm generates a black box (which is actually the title of a 2024 podcast series about artificial intelligence produced by *The Guardian*), out of which comprehensible

statements, images, and sounds emerge. Perhaps one of anthropology's most urgent tasks is to focus on the way that mathematics still lurks behind the magicians' black boxes that give power to some and not to others.

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Notes

1. The translations above are those of Matthew Carey; the page numbers are from Küchler and Carey (2023).
2. <https://www.theguardian.com/technology/series/blackbox> (accessed 30 March 2024).

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