

COSMIC SPREADSHEETS

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“To be rational is, simply, to think in ratios, like the ratios that govern the geometry of the stars.”¹ The American religion professor Alan Jay Levinovitz questions the authority of economics and argues that the discipline is a modern version of astrology. His concerns are particularly resonant in an era saturated with data, and therefore with opportunities to find and interpret ratios between them. What I want to discuss here is how data and ratios have been used and legitimised in a specific type of publication—the almanac. Almanacs are practical guides to the year ahead published since at least the seventeenth century² in areas such as farming, nautical navigation, and finance. I would like to revisit the almanac as a prototype for contemporary data analytics—to use it as a guide to understand the multiple roles played by data today, their connection to the cosmos, and the rationalities that they support.

As artefacts, almanacs reveal broader systems and histories in their tangible design details. By transforming collected data into predictions, they are rudimentary predecessors to the kinds of algorithmic systems at work today. In their pages, I am looking for visible signs of the history of prediction in order to retrace some of the trajectories that led to today’s big data systems. I am not relying only on observation: I am also making an almanac myself to reflect, with first-hand experience, on the production and publication of predictions. My aim is not to reveal how prediction “works” in technical terms, but rather to unpack the cultural space that the almanac has occupied and to question what this space looks like today.

Almanacs have played a major role in the long history of statistics. Technology and politics writer Adrienne LaFrance calls them precursors to the information age, early analogue versions of smartphones with “apps” such as calendars, navigation maps, weather forecasts, and other predictive widgets.³ They presented the cosmos as orderly and rational: “The universe as machine: Once you get the operating instructions, you can tell the future.”⁴ Spots on the surface of the Sun, for example, were thought to have a direct influence over the weather on Earth. Since its first edition in 1792, the *Old Farmer’s Almanac* presented an ideal of order and regularity to farmers whose livelihoods depended on the weather. Aside from looking directly to the stars for guidance, the statistical methods used in astronomy were applied far beyond farming, and have been since as part of the first and second “big-data revolutions”.

Almanacs also include other forms of cosmic imaginaries such as astrology, which interprets the angles and ratios between the Earth, the planets and the stars as vectors for predictions. This geometrical mode of cosmic prediction has roots extending far back into prehistory,⁵ yet it continues to thrive despite the “paradigm shifts” of big data. It survives, for example, in the pages of the *Old Moore’s Almanac*, published since 1697. Far from being outdone by scientific methods, astrology has integrated new tools and technologies, gaining in precision and sophistication. In the west “a new urban astrology appeared which is still with us. More individualistic than before, it succeeded in adapting to consumer capitalist society.”⁶ Today purpose-built software packages use astronomical ephemeris data—the positions of planets for millennia past and future—to compute astrological readings and charts.

Almanacs show different modes of relating the cosmos to events on Earth. They highlight the links between astronomy and early forms of data science—including methods for data collection and computation⁷—while also disseminating folk knowledge of the stars as sources for divination. While these might seem incompatible today, almanacs are documents from a time when their separation was far from clean-cut. They complicate the apparent divide between data science and divination today, when the former increasingly claims to objectively and accurately predict the future.⁸

As a pop culture artefact, the almanac is also an opportunity to consider data science and divination from a graphic design perspective. In recent years a number of art and design projects have explored the interplay between data, divination, and computation. American artist Ingrid Burrington creates astrological charts for the Five Eyes⁹ spy agencies.¹⁰ Artist collective RYBN’s *The Golem* (2017) is a computer that applies ancient kabbalistic hermeneutics to its own processes and daemons.¹¹ Computational poet Allison Parrish teaches a class at NYU’s Interactive Telecommunications Program that

interrogates forms of divination in digitally-mediated environments, “from the casting of lots to computer-generated randomness to the contemporary revival of Tarot; from reading entrails to astrology to data science.”¹² Designer Shing Tat Chung’s *Superstitious Fund* trades on the stock market according to “lunar cycles and numerology” as well as an internal logic of “lucky and unlucky values.”¹³ While stories of divination and magic have long been leveraged to promote the supernatural powers of computers,¹⁴ these critical approaches in art and design have a different objective. They use divination as a reminder that despite dominant narratives of technological progress and computational powers, predicting the future remains an elusive goal. They develop a cultural language to examine opaque technological systems of prediction and control, which were constructed over long, and sometimes murky, histories.

MONISM AND COSMIC ORDER

Almanacs offer glimpses into what geographers Trevor Barnes and Matthew Wilson call “big data’s historical burden”.¹⁵ Specifically, they illustrate how the current fixation with data as a source of predictions is in part founded on monism, “the idea that there is only one set of principles that applies to the explanation of both natural and social worlds”.¹⁶ Breakthroughs in astronomy and physics in the eighteenth-century, such as the first predicted return of Halley’s comet in 1759, reinforced the notion of an underlying order to the natural world. “Social physics” transposed this idea to predict the social world. Belgian astronomer Adolphe Quetelet famously used methods from astronomy to predict marriage, suicide, and crime. In 1830 his statistical construct of an “average man” aimed to “facilitate the recognition of laws analogous to those of celestial mechanics in the domain of society.”¹⁷ Quetelet used Newtonian gravity and Gaussian error curves—later known as “normal” distributions—to predict the behaviours of human populations. As Ian Hacking shows, this involved blatant “jumping to conclusions” but still had a profound influence on “the twentieth-century conceptual scheme of truths and possibilities to which we still subscribe”.¹⁸

Elsewhere, astronomy and its data practices were used to legitimise speculative finance. In nineteenth-century Britain the people doing astronomy and the people doing business were, in some cases, the same upper-class men. Edmond Halley not only gave his name to the famous comet but also authored the first mortality table for use in life insurance. Figures like Francis Baily, John Herschel, and Charles Babbage, dubbed the “business astronomers” by British historian William Ashworth, used scientific techniques of data management, such as double-entry book-keeping, to give finance the veneer of scientific rigour. They anchored their “accountant’s view of the world”¹⁹ in records and tables, the stuff of objective observations rather than speculation, which was seen as immoral.

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TABLE I.
Valeur, à la fin de n années, de 1 franc placé à intérêt composé.
 Valeur à la fin de n années... $(1+r)^n$ fr.

ANNÉES	TAUX DE L'INTÉRÊT r.			
	2 ½	3	3 ½	4
n.	fr	fr	fr	fr
1	1,025 000	1,030 000	1,035 000	1,040 000
2	1,050 025	1,060 090	1,071 223	1,081 600
3	1,076 891	1,092 227	1,108 718	1,124 864
4	1,103 813	1,125 509	1,147 593	1,166 859
5	1,131 408	1,150 274	1,187 686	1,216 653
6	1,159 693	1,194 052	1,229 255	1,265 319
7	1,188 686	1,220 874	1,272 279	1,315 932
8	1,218 403	1,266 278	1,316 899	1,368 569
9	1,248 863	1,304 273	1,363 897	1,423 312
10	1,280 085	1,343 915	1,410 599	1,480 244
11	1,312 087	1,384 234	1,459 970	1,539 454
12	1,344 889	1,425 261	1,511 069	1,601 032
13	1,378 511	1,468 534	1,563 956	1,665 074
14	1,412 071	1,512 390	1,618 665	1,731 676
15	1,448 298	1,557 097	1,675 319	1,800 944
16	1,484 500	1,602 766	1,733 985	1,872 981
17	1,521 618	1,650 878	1,794 676	1,947 900
18	1,559 659	1,702 433	1,857 489	2,025 817
19	1,598 650	1,753 506	1,922 501	2,106 849
20	1,638 616	1,806 111	1,989 789	2,191 133
21	1,679 582	1,860 295	2,059 431	2,278 768
22	1,721 571	1,916 163	2,131 512	2,369 919
23	1,764 611	1,973 582	2,206 144	2,464 716
24	1,808 726	2,032 794	2,283 398	2,563 304
25	1,853 941	2,093 778	2,363 245	2,665 836
26	1,900 293	2,156 591	2,445 929	2,772 470
27	1,947 800	2,221 289	2,531 507	2,883 369
28	1,996 459	2,288 998	2,620 172	2,998 703
29	2,046 287	2,359 666	2,711 898	3,118 651
30	2,097 298	2,432 262	2,806 794	3,243 398
31	2,150 097	2,509 080	2,905 031	3,373 133
32	2,203 757	2,579 083	3,006 798	3,508 059
33	2,258 851	2,652 335	3,111 942	3,648 381
34	2,314 322	2,731 965	3,220 860	3,794 316

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Jours du mois	Lune.						Planètes.					
	PASSAGE au méridien		LEVER.		COUCHER.		LEVER.		COUCHER.		PASSAGE au méridien	
1	h	m	h	m	h	m	h	m	h	m	h	m
2	7	38	4	59	11	54	5	25	2	25	1	22
3	8	51	5	16	0	25	6	38	3	38	2	3
4	9	46	6	13	1	20	7	27	4	30	3	3
5	10	41	6	59	2	28	8	28	5	25	4	22
6	11	36	7	34	3	46	9	29	6	53	5	2
7	0	29	8	1	5	3	10	29	7	31	6	1
8	1	20	8	22	6	25	11	29	8	28	7	0
9	2	9	8	49	7	47	12	29	9	13	8	1
10	3	56	8	55	9	13	13	29	10	35	9	0
11	4	44	9	11	10	35	14	29	11	59	10	3
12	5	26	9	48	11	59	15	29	12	47	11	7
13	6	22	10	14	1	24	16	29	1	24	12	4
14	7	21	10	47	2	54	17	29	2	48	13	3
15	8	22	11	23	3	47	18	29	3	47	14	2
16	9	23	0	23	5	12	19	29	4	23	15	1
17	10	24	1	47	6	2	20	29	5	12	16	0
18	11	15	3	6	6	39	21	29	6	39	17	15
19	—	4	25	7	5	14	22	29	7	5	18	14
20	0	4	5	41	7	24	23	29	8	24	19	13
21	0	50	6	55	7	40	24	29	9	4	20	12
22	1	33	8	5	7	55	25	29	10	16	21	11
23	2	13	9	15	8	7	26	29	11	15	22	10
24	3	54	10	23	8	21	27	29	12	3	23	9
25	3	34	11	33	8	34	28	29	13	33	24	8
26	4	17	—	—	8	50	29	29	14	35	25	7
27	5	1	0	43	9	11	30	29	15	11	26	6
28	5	49	1	34	9	39	31	29	16	34	27	5

N. L. le 6, à 8h 4^m mat. P. L. le 20, à 8h 10^m mat.
P. Q. le 13, à 5h 39^m mat. D. Q. le 28, à 10h 1^m mat.

Bureau des Longitudes (1875) 'Annuaire pour l'an 1875 publié par le Bureau des longitudes'.

We can see monism and the accountant's view of the world quite literally on display in the almanac publications of the time. Tables showing the positions of planets were published alongside interests on loans, using similar layouts and visual language. Almanacs also provided a wide range of unit conversions, standards, population statistics, and so on. In Britain, the almanac was the site of a power grab by the business astronomers. Their newly established Astronomical Society took over the publication of the *Nautical Almanac* from the Board of Longitude, as part of a bigger push against the Royal Society and its focus on natural history.²⁰

These examples show the almanac as part of the foundations of the authority of numbers in society, a focus on counting—and later computing—which draws its legitimacy directly from the cosmos. There is, however, another side to the parallel between almanacs and the information age suggested by Adrienne LaFrance. As Jeff MacGregor states, "Like the Internet itself, the [Farmer's] Almanac has always been a happy grab bag of marginalia."²¹ Unlike the grand promises of big data, almanacs don't take themselves too seriously. A 2017 issue of *The Old Farmer's Almanac* bills itself as "useful with a pleasant degree of humour." Another cover, from 1847, advertises "new,

useful, and entertaining matter.”²² These almanacs mix the scientific, the mundane, and the miscellaneous; alongside the tables mentioned above are remedies, rumours, proverbs, recipes and tips. This translates into a visual vernacular between tradition and prediction, seen for example in the *Old Farmer’s Almanac* calendar, which includes astrological symbols, biblical dates, tides, and baseball.

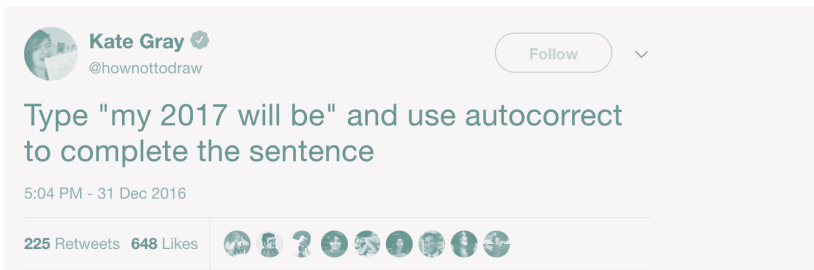
D. M.	D. W.	Dates, Feasts, Fasts, Aspects, Tide Heights	Weather ↓
1	Th.	Circumcision Union Flag raised Cambridge 1776	New ●
2	Fr.	He that fixeth his soul on show, loseth reality.	{10.8 Dig a
3	Sa.	♄♃♉ • Tides {9.5 10.6 •	rift in
4	D	2nd S. a. Ch. • ⊕ at Peri. {9.4 10.3	the
5	M.	N.H. indep. colony 1776 {9.8 9.8	drift.
6	Tu.	Epiph. • ♃ Gr. El. • ♄ on E. 19° • ♃ on Eq. {9.2 9.4	Need
7	W.	Propriety governs the superior man: law, the inferior man.	galoshes
8	Th.	♄ Apo. • in Washington asked Cong. for funds for Capitol 1796	it
9	Fr.	♄♃♉ 1st use safety lamps by coal miners 1816	sloshes.
10	Sa.	Paine’s Common Sense publ. 1776 Tides {8.7 7.9	Mild
11	D	1st S. af. En. • ♄♃♉ {8.7 7.9	still

Old Farmer’s Almanac calendar, Thomas, R. B. (1976) *The Old Farmer’s Almanac*, Boston, Jenkins, Palmer & Co.

Almanacs were, at least in the nineteenth century, at the cutting edge of western scientific rationality. However, as a genre, they also included the very themes—such as astrology and gambling—which science was trying to replace. *The Old Moore’s Almanac*, for example, has more in common with a tabloid newspaper than with a scientific bulletin. *Old Moore’s* lottery *Astro-indicators* illustrate this with a table of predictions of Euro Millions lottery numbers for each astrological sign. While this is precisely the type of “immoral” speculation against which the business astronomers—and many others since—have sought to differentiate themselves, the almanac presents the boundary between legitimate and illegitimate modes of prediction as blurry and porous.

AN ALMANAC FOR THE PETABYTE AGE

If it was designed today, what would an almanac look like? The accountant's view of the world has been amplified to the point of "actuarial saturation"²³ with big data, and monism is taken for granted, as illustrated for example by the long relationship between physics and Wall Street.²⁴ While *The Old Farmer's Almanac*, *Old Moore's Almanac* and others are still being published, they look like quaint relics in the current media landscape. The almanac as a cultural space however, is alive and well. Vast networks and infrastructures are dedicated to storing data, and computing predictions. If almanacs were instruments to navigate an uncertain world, their contemporary equivalent might be the "data dashboards" used in anything from business analytics to city management.²⁵ Instead of tables for the interests on loans, today's almanac includes financial charts and live news-feeds like a Bloomberg Terminal. Instead of a yearly calendar for life advice, the networked almanac relays tips and jokes from continuous feeds such as #astrologymemes.²⁶ With a personalised touch, and "a pleasant degree of humour," it also provides an oracle for the year ahead based on a predictive keyboard trained on the most mundane and intimate writing, emails, SMSes, tweets, and searches. In these examples and potentially many others, the almanac is thriving, not as a single publication but distributed across a wide range of digital media.

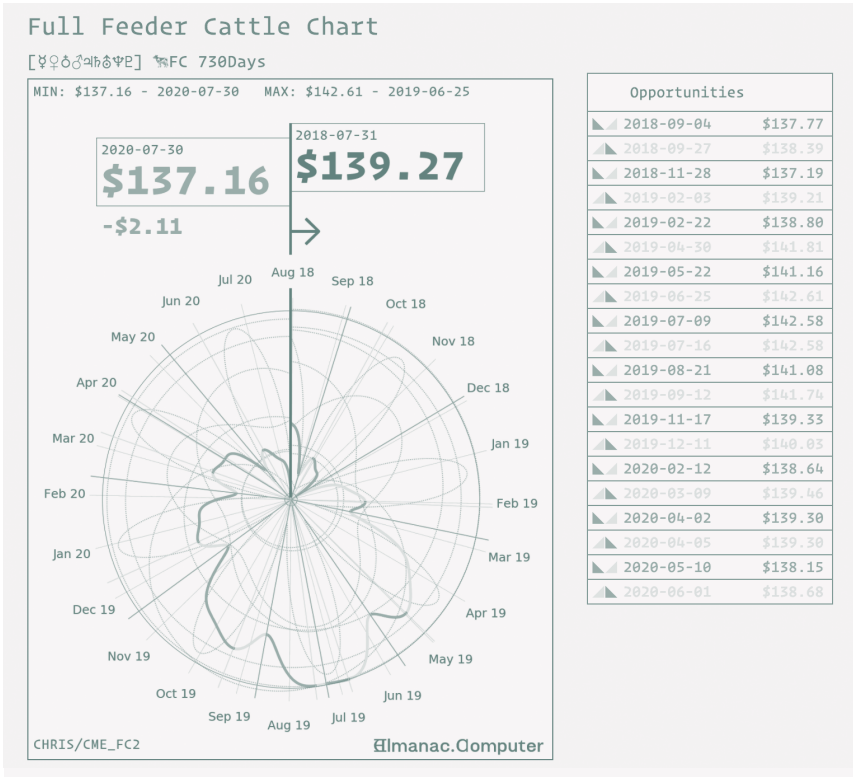


Tweet - Kate Gray (2016)

Revisiting the almanac today is an attempt to bind these scattered sections back together—to bring this peculiar predictive artefact and its history to bear on contemporary modes of algorithmic prediction. I am doing this through digital and critical making.²⁷ Building my own almanac with the tools of data science—including the Python programming language, data visualisation tools such as D3, and publishing formats like the Jupyter notebook. I take monism as a license to experiment with computational belief systems and to build computational diagrams that link the movements of planets with events on earth, such as the fluctuations of financial markets. *The Monistic Almanac* is an automated online publication that is updated daily. It is made up of multiple widgets, each implementing their own predictive rationality.



The Monistic Almanac cover.



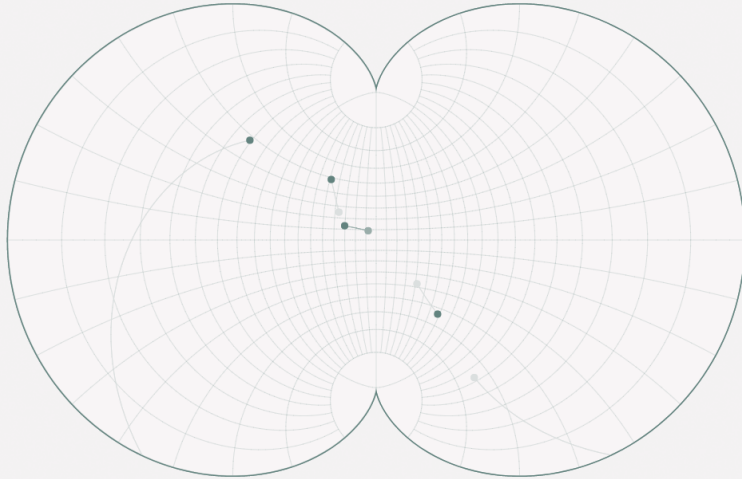
COSMIC COMMODITY CHARTS

Here the price of commodity futures is predicted using the positions of the planets of the Solar System. The relationship between the two is “learned” using regression on historical market data and the planet positions in the DE431 Ephemeris from NASA’s Jet Propulsion Laboratory. The model can then derive future prices from planet positions, provided by the ephemeris until the year 17191.

CRISIS PROXIMITY INDEX

CPI is an astrology based on the 2008 financial crisis. It is based on the reference point of August 9, 2007, when BNP Paribas froze three of its investment funds, triggering the first signs of panic among investors. Daily planet positions are compared to this base vector, using distance as an indicator of a possible new crisis.

Crisis Proximity Index



	♂	♀	♂	♀	CPI
2018-07-25	↑ 0.67	↓ 0.59	↑ 1.49	↑ 2.28	↑ 5.03
2018-07-26	↑ 0.68	↓ 0.59	↑ 1.49	↑ 2.28	↑ 5.04
2018-07-27	↑ 0.68	↓ 0.58	↑ 1.49	↑ 2.28	↑ 5.05
2018-07-28	↑ 0.69	↓ 0.58	↑ 1.49	↑ 2.29	↑ 5.05
2018-07-29	↑ 0.7	↓ 0.57	↑ 1.5	↑ 2.29	↑ 5.06
2018-07-30	↑ 0.71	↓ 0.57	↑ 1.5	↑ 2.29	↑ 5.06
2018-07-31	↑ 0.71	↓ 0.56	↑ 1.5	↑ 2.29	↑ 5.06
2018-08-01	↑ 0.71	↓ 0.56	↑ 1.5	↑ 2.29	↑ 5.06
2018-08-02	↑ 0.72	↓ 0.55	↑ 1.5	↑ 2.29	↑ 5.06
2018-08-03	↑ 0.72	↓ 0.55	↑ 1.5	↑ 2.29	↓ 5.06
2018-08-04	↑ 0.72	↓ 0.55	↑ 1.5	↑ 2.29	↓ 5.06

When to 🏛️ get married 🏛️ in COLOMBO, SRI LANKA

	Jul. 2018	Aug. 2018	Sep. 2018	Oct. 2018
M	30	6 13 20 27	3 10 17 24	1 8 15 22 29
T	31	7 14 21 28	4 11 18 25	2 9 16 23 30
W		1 8 15 22 29	5 12 19 26	3 10 17 24 31
R		2 9 16 23 30	6 13 20 27	4 11 18 25
F		3 10 17 24 31	7 14 21 28	5 12 19 26
S		4 11 18 25	1 8 15 22 29	6 13 20 27
S		5 12 19 26	2 9 16 23 30	7 14 21 28
	Nov. 2018	Dec. 2018	Jan. 2019	Feb. 2019
M	5 12 19 26	3 10 17 24 31	7 14 21 28	4 11 18 25
T	6 13 20 27	4 11 18 25	1 8 15 22 29	5 12 19 26
W	7 14 21 28	5 12 19 26	2 9 16 23 30	6 13 20 27
R	1 8 15 22 29	6 13 20 27	3 10 17 24 31	7 14 21 28
F	2 9 16 23 30	7 14 21 28	4 11 18 25	1 8 15 22
S	3 10 17 24	1 8 15 22 29	5 12 19 26	2 9 16 23
S	4 11 18 25	2 9 16 23 30	6 13 20 27	3 10 17 24
	Mar. 2019	Apr. 2019	May. 2019	Jun. 2019
M	4 11 18 25	1 8 15 22 29	6 13 20 27	3 10 17 24
T	5 12 19 26	2 9 16 23 30	7 14 21 28	4 11 18 25
W	6 13 20 27	3 10 17 24	1 8 15 22 29	5 12 19 26
R	7 14 21 28	4 11 18 25	2 9 16 23 30	6 13 20 27
F	1 8 15 22 29	5 12 19 26	3 10 17 24 31	7 14 21 28
S	2 9 16 23 30	6 13 20 27	4 11 18 25	1 8 15 22 29
S	3 10 17 24 31	7 14 21 28	5 12 19 26	2 9 16 23 30
	Jul. 2019			
M	1 8 15 22 29			
T	2 9 16 23 30			
W	3 10 17 24			
R	4 11 18 25			
F	5 12 19 26			
S	6 13 20 27			
S	7 14 21 28			

ELECTIONAL ASTROLOGY

This type of astrology is forward-looking: it is about finding the best date for a particular task or event, such as planning a meeting, a haircut, or a wedding. I translated the set of criteria for various events found in *Astrology for Dummies* into Python code, which outputs a calendar for a given task or question and location.²⁸

DOWN TO EARTH

Designing and programming *The Monistic Almanac* involves learning to use the tools of data science. This is not, however, with the aim of acquiring technical fluency. Instead, these efforts are a mode of making concerned with what digital humanities scholar Jentery Sayers calls “conceptual matter.”²⁹ While my enquiry into prediction is practice-based, “not knowing all the circuitry may actually spark persuasive interventions from the periphery.”³⁰ I encountered, for example, a Python package called Pandas; an essential part of the data science “stack” that enables the transformation of flat files, the spreadsheets containing data, into vectorised arrays, data as mathematical shapes on which predictive algorithms can operate. With Pandas, the “accountants’ view of the world” mentioned above comes full circle. While the business astronomers transposed data practices from astronomy to finance and business, Pandas originated as a tool to handle data in a hedge fund and is now widely used in the sciences, including astronomy.³¹ Such connections reveal a powerful imaginary of data as a universal substrate in which the future can be read. They emerge through practice, using contemporary tools against the backdrop of the history of prediction.

I started this project out of scepticism towards the promise that data science could predict everything. I was astounded to see “social physics” and its dubious foundations being repackaged as cutting-edge technology after nearly two centuries.³² I wanted to push monism to its absurd extreme, in a similar vein as Tyler Vigen’s *Spurious Correlations*,³³ using the almanac as a stage. However, as I spend time immersed in making *The Monistic Almanac*, I begin to perceive a more intricate diagram of relations between data science and divination. In fact, my initial position has changed through working on this project.

My first impulse was to use astrology to dismiss data science, to imply that they are equally pseudo-rational. Robin James argues this very well in her update of *The Stars Down to Earth*, Adorno’s critique of the *LA Times* astrology column, for the big data era.³⁴ She argues that forecasts from both astrology and data science aestheticise “unfashionable superstitions”³⁵ through charts and tables. Instead of forecasts, they produce conservative prescriptions, “only ever reproduc[ing] society and its most conventional norms, values, and practices.”³⁶ By bringing the stars down to earth, both data science and astrology insist that society, like a planet, must be on a regular and stable orbit. James concludes with a call to “shoot for the stars” instead of bringing them down to fit a conservative view of the future.

One way of achieving this might be, as Joshua Ramey suggests, to take divination seriously as a “generic, even universal dimension of human culture.”³⁷ James may dismiss data science and astrology in equal measure,

but she leaves unanswered the question of how to deal with an unknown future. Ramey argues that humans have had the need to “read chance aloud”³⁸—to relate to it in some way—since ancestral times. These relationships to chance, however are always *mediated*, never direct or apolitical. When the market is presented like an objective divinatory device, it caters to our innate need to cope with chance. It masks neoliberal politics as a neutral force of nature rather than a foreclosing of unprofitable and suboptimal futures. “Shooting for the stars”, in this case, would be to aim for what Ramey calls an *expansive* politics of divination, “marked by curiosity, presumptive generosity, and genuine openness to transformation.”³⁹

With this in mind, the potential for critique through projects like *The Monistic Almanac* or other previously-mentioned examples may not lie in comparisons or analogies between computation and divination. Instead, these works can serve as a reminder that the two have never really been separate. Both are rooted in the ideal of a universal force, logic or code as the key to knowledge about the future. The binary system at the very heart of computing comes, in part, from Gottfried Wilhelm Leibniz’s fascination with the I-Ching divinatory system in the seventeenth century.⁴⁰ Data science and astrology, meanwhile, are both modes of using the cosmos to relate to chance—whether by transposing statistical techniques and ideals of regularity, or by looking directly at the angles between planets. In the western world, far more authority is ascribed to the former than the latter, of course. The “accountants’ view of the world” has a monopoly over the cosmic. Drawing attention to this may be the first step towards restoring the multiplicity of voices we glimpse in almanacs, including those who Isabelle Stengers calls the “story-tellers, quacks, popular customs and creeds, knowledge without credential”;⁴¹ towards countering a data-centric monoculture of imaginaries, and cultivating multiple relationships to chance, while paying attention to the politics of their mediation.

This project is not about romanticising the occult, or challenging scientific knowledge. This is actually what the “big data fundamentalists”⁴² do when they name military intelligence company Palantir after a crystal ball in *The Lord of the Rings*, or proclaim the “end of theory.”⁴³ Instead, it is about keeping a close eye on the credentials assigned to predictions, and about questioning which ones are allowed to remake the world in their image.

Visit *The Monistic Almanac* at <https://almanac.computer>

- 1 Levinovitz, A. J. (2016) 'How economists rode maths to become our era's astrologers', Hasselby, S. (ed), *Aeon* [Online]. Available at <https://aeon.co/essays/how-economists-rode-maths-to-become-our-era-s-astrologers> (Accessed 9 August 2018).
- 2 Almanacs or their equivalent have been used for millennia in cultures across the world. In this article I focus on almanacs as mass-produced publications in the US and Europe as part of the history of statistics and prediction in the western world.
- 3 LaFrance, A. (2015) 'How The Old Farmer's Almanac Previewed the Information Age', *The Atlantic* [Online]. Available at <https://www.theatlantic.com/technology/archive/2015/11/how-the-old-farmers-almanac-previewed-the-information-age/415836/> (Accessed 9 August 2018).
- 4 Tim Clark, executive editor of The Old Farmer's Almanac, interviewed in *The New Yorker* in 1988. Cited in LaFrance (2015).
- 5 Willis, R. G. and Curry, P. (2004) *Astrology, science and culture*, Berg Publishers. p.17
- 6 *ibid.* p.51
- 7 Grier, D. (2007) 'Part I: Astronomy and the Division of Labor', in *When computers were human*, Princeton, N.J. Woodstock, Princeton University Press, p. 9–88.
- 8 See for example:
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