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RESEARCH ARTICLE

History as capture

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Abstract

Myth, hype and industry-captured historiographies of AI, machine learning and computing depict the current moment as a unique and unprecedented confrontation with computational power, paying particular attention to the devastating effects this has on vulnerable communities (better: communities made vulnerable). But automated decision schemes are neither new nor newly urgent; they are the inheritance of almost seventy years of computing history, a history that has never not been entangled with state repression, genocidal and ecocidal violence and racialized expropriation. Carceralilty and artificial intelligence have a shared history, and the entanglements between them remain underappreciated by history writing on computing – despite the near-universal injunction to leverage history as a means to critique and counteract the cultural hegemony of computing. This paper examines some of the tensions underlying such calls for historical critique, calling into question the efficacy of such a project. I offer a study of the complex senses of history and development at work in the 2006 International Congress of Mathematics, discuss recent historiographies of computing (and science) from guild historians, and describe the ways academic history writing reproduces the same relations of dominance and campaigns of creation and conservation that scaffold mathematics and artificial intelligence.

Myth, hype and industry-captured historiography depict this moment as a unique and unprecedented confrontation with computational power and the devastating effects it has on vulnerablized communities.[1] But automated decision schemes are neither new nor newly urgent; they are the inheritance of almost seventy years of computing history, a history that has never not been entangled with state repression, genocidal and ecocidal violence and racialized expropriation.[2] Community archives are replete with evidence of this longer history: press coverage of the US Customs Consolidated Data Network from 1989 promising to 'seal the border', technical papers from as early as 1965 describing the automated apprehension of criminalized targets, and automated screening systems proposed by the Carter administration to appraise welfare and public relief eligibility.[3] Predictive policing, risk assessment algorithms and the robot dogs being deployed at

1 Meredith Whittaker, 'The steep cost of capture', *Interactions* (November 2021) 28, pp. 50–5.

2 Jennifer S. Light, *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America*, Baltimore: Johns Hopkins University Press, 2005.

3 Elizabeth Horwitt, 'Customs net seals U.S. border', *ComputerWorld*, February 1989, p. 8; Andrew Vazsonyi, 'Automated information systems in planning, control and command', *Management Science* (1965) 11, pp. B2–B41; David Burnham, 'The watch on computer privacy', *New York Times*, 15 January 1978, Section E, p. 7.

the southern border to hunt down migrants – in one sense, these technologies are 'new'; in another, they exemplify more of what Ruth Wilson Gilmore articulates as the 'changing same'.[4] Contemporary computing practices descend from (and are informed by) the carceral violence of plantation, reservation and penal science (among others); carcerality and artificial intelligence are mutually reinforcing projects. These artefacts of violent dispossession find use in the work of state repression against racially criminalized and poor communities targeted by the state – of which there are many.

That these histories are deeply intertwined nevertheless remains underappreciated by common-sense historiography, something often attributed to a culture of presentism or anti-historicism that pervades technical communities, radiating outward. This might explain the broad-based calls issued by humanists to leverage history to hold AI to account: 'there is always more to learn about the past that will help us shape the future', writes Mar Hicks. They emphasize that the 'failure stories – not just feel-good narratives that make us feel like things are bound to always get better in the long run – are critically important if we, as citizens and workers, are going to play a productive role in the struggle for a better future'.[5] On one hand, the near-universal injunctions to historicize computing and artificial intelligence make perfect sense: history, argues Manning Marable, is more than a cataloguing of artefacts or the narrativizing of collective experience: 'History is also the architecture of a people's memory, framed by our shared rituals, traditions, and notions of common sense.'[6] History (which I will treat both as the sociohistorical process or 'fact' of past of events, and as our knowledge of that process given the irreducible distinction and overlap between the two), then, becomes political in two senses: in the first instance, it is transmitted through a press of political interests that manifest in 'narrative gaps, strange silences, and lacunae of all kinds [that] litter its interpretive landscape'.[7] In the second, history writing itself offers the potential for profound personal and social reorientations – the effects of seizing 'hold of memory as it flashes up at a moment of danger'.[8] The stakes of history writing have never been low.

History, temporality, our sense of the present and who we are – and how we interpret our past in relation to it – are filtered through layers of ritual. There is no exception for history-writing communities built around domains like science, mathematics or artificial intelligence. Still, those of us outside these communities, who have come to rely on their reservoirs of expertise, put a lot of faith in professionalization and the guild-like cultures of academe to cultivate for us a knowable, usable past: something close to a truth, built, if not by a preponderance of evidence, then by scholarly consensus. It's troubling, then, that, in the history writing produced about computing and its communities, violence is not a formative object of inquiry. Instead, in the scholarly traditions and academic guilds where artificial intelligence, technology, computing, algorithms, media or science are the

4 Ruth Wilson Gilmore, *Golden Gulag: Prisons, Surplus, Crisis, and Opposition in Globalizing California*, Berkeley: University of California Press, 2007.

5 Mar Hicks, 'When did the fire start?', in Thomas S. Mullaney, Benjamin Peters, Mar Hicks and Kavita Philip (eds.), *Your Computer Is on Fire*, Cambridge, MA: MIT Press, 2021, pp. 11–26, 13.

6 Manning Marable, *Living Black History: How Reimagining the African-American Past Can Remake America's Racial Future*, New York: Basic Civitas, 2006, p. 1.

7 Marable, op. cit. (6), p. 21. This irreducibility is not without specificity; as Michel-Rolph Trouillot explains, the semantic ambiguity in the vernacular use of the word 'history' (between history as fact and history as account) indicates the fundamental importance of political intent: 'the overlap and the distance between the two sides of historicity may not be susceptible to a general formula. The ways in which what happened and that which is said to have happened are and are not the same may itself be historical'. Michel-Rolph Trouillot, *Silencing the Past: Power and the Production of History*, Boston, MA: Beacon Press, 2015, pp. 3–4.

8 Walter Benjamin, 'Theses on the philosophy of history', in Benjamin, *Illuminations: Essays and Reflections* (tr. Harry Zohn), New York: Schocken Books, 2007, pp. 253–64, 255.

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determining object of inquiry, 'carceral' enters as a modifier, an aberration, a subgenre of computing – not as co-constitutive of computing – and the violent histories through which these technical artefacts emerge are displaced and banalized.[9]

The history of artificial intelligence, if historicized differently, can recount the history of calculative techniques innovated and refined through regimes of carceral violence. It can thread a line of continuity through carceral geographies: the Middle Passage, the plantation, the reservation, the prison, the housing project, the refugee camp, the detention centre, the border, and so on. Historic and contemporary carceral containment and immobilization share more than the expression of brutality: they share a scientific knowledge of carcerality. Contemporary computing techniques can trace a direct line of descent from the knowledge accrued from plantation management techniques, from the genocidal accounting of the Commission of Indian Affairs tabulating federal larders, from the export mandates that colonizers used to effect famine in Bangladesh, from whatever perverse mathematics makes it possible for oil companies to calculate how much longer they can extract and excrete until the whole thing falls apart.[10] And yet: these remain the unthinkable histories of AI.[11] History-writing communities remain convinced that their political work is to cull from their archives a history of AI; that there is something obscured or hidden to be recovered from this past that can elucidate a strategy for the present. All the while, there is an insistence on deracinating computing, abstracting it from its contexts of emergence, and articulating AI, machine learning and computing as given objects of historical interest.

It's helpful to remind ourselves from time to time that computing and calculative practices are far from universal. Nor are they particularly modern or reducible to mathematical rationalities of the kinds familiar to computing practitioners today. Instead of pursuing a history of AI, this paper begins by declaring that *there is no such thing as AI*. Like similar indictments of 'public safety', 'free markets', and 'humanitarian intervention', such a declaration is an invitation to refuse conscription into political projects that enact war against our people. This is a historiographic posture, one that takes exception with the very practice of stabilizing the artefact of computing, thereby affirming the directives of violent statecraft bound up in the advancement of colonial technologies. This paper offers a study of the always-already political inheritance of computing and its adjacent communities, and cautions against the modes of guild historiography that would have us believe that such politics was ever obscured to begin with. I conclude with a discussion of how an equivocation between 'context' and politics in recent historiography risks displacing historians' potential solidarity with those made vulnerable to marginalizations.

Mathematics as politics: Madrid, 2006

'In sharing mathematical knowledge and experience with those who work around the world, it is the whole mathematical community that benefits, and we make our own contribution to peace and stability through the binding together of peoples by a common language independent of politics, religion, and culture'.[12] With those words, Sir John Ball,

9 Trouillot, op. cit. (7), pp. 96–7.

10 Caitlin Rosenthal, *Accounting for Slavery: Masters and Management*, Cambridge, MA: Harvard University Press, 2019; Meredith Whittaker, 'Origin stories: plantations, computers, and industrial control', *Logic* (May 2023) 19, at https://logicmag.io/supa-dupa-skies/origin-stories-plantations-computers-and-industrial-control (accessed 27 October 2023); Mike Davis, *Late Victorian Holocausts: El Niño Famines and the Making of the Third World*, London and New York: Verso, 2017.

11 Trouillot, op. cit. (7), p. 82.

12 Marta Sanz-Sole, Javier Soria, Juan L. Varona and Joan Verdera (eds.), *Proceedings of the International Congress of Mathematicians, Madrid 2006*, 3 vols., Zurich: EMS Press, 2007, vol. 1, p. 27.

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president of the International Mathematical Union (IMU), opened the 25th International Congress of Mathematicians in Madrid. The year 2006 was an ambitious one for the ICM: over 3,600 participants, representing a record high of 108 countries, were in attendance, including Spain's now *rey emérito* King Juan Carlos, who made an appearance during the opening ceremony.[13]

The year 2006 was a significant one for the ICM, one that marked a subtle shift in how the IMU understood its own history, its position in the world and how it sees its 'science' advancing in future. At the IMU general assembly that year, a resolution was endorsed setting in motion plans for a 'Digital Mathematical Library': a worldwide enduring network of digital mathematical literature.[14] The year 2006 was also the first time the Carl Friedrich Gauss Prize was awarded, a new recognition awarded jointly with the German Mathematical Union and inaugurated in Madrid 'to honor scientists whose mathematical research has had an impact outside mathematics – either in technology, in business, or simply in people's everyday lives'.[15] 'An overwhelming majority of mathematicians would say that mathematics are beautiful in themselves and that they are their own justification. But mathematics are also important, not to say necessary', the Congress Press Kit proclaimed. 'They could be called the invisible science; part of their importance arises from the fact that they are behind many aspects of daily life, at once hidden and essential. They are also the engine of change; there is no aircraft, no robot, no computer … no future technology without mathematics.'[16]

True, this emphasis on the applied and productive potentialities of mathematics was practical: Manuel de León, president of the ICM 2006, described in the published proceedings how the executive committee struggled to

> attract funding from the private sector, which eventually fell short of initial expectations, and which except for organisations such as the Vodafone Foundation, BSCH, the Areces and Enterasys Foundations, as well as Spanish companies and those with their headquarters in Spain, are still a long way from recognizing mathematics as a driving force in research, technological development, and innovation.[17]

But these shared objectives – to upgrade and modernize the ICM, and, in the process, reclaim the rightful territorial inheritance of mathematics – are deeply rooted in the organization's culture. Then emeritus of the Institute of Advanced Study (which he helped organize after almost three decades at Princeton) Oswald Veblen, nephew of Thorstein Veblen, remarked in 1954, 'The series of International Congresses are very loosely held together. They are not congresses of mathematics, that highly organised body of knowledge, but of mathematicians, those rather chaotic individuals who *create and conserve it*'.[18]

Create and conserve. The ICM was, from the first instance, a site of historical production. Held every four years, the conference traces its own origin to an 1893 convening organized by the then newly founded University of Chicago's Faculty of Mathematics as

13 Guillermo Curbera, *Mathematicians of the World, Unite! The International Congress of Mathematicians – A Human Endeavor*, Wellesley, MA: CRC Press, 2009, p. 301.

14 International Mathematical Union, 'Resolutions of the IMU general assembly 2006-08-20', at www.mathunion.org/fileadmin/IMU/Organization/GA/Resolutions/RESOL2006.pdf (accessed 27 October 2023).

15 International Mathematical Union, 'Carl Friedrich Gauss prize', at www.mathunion.org/imu-awards/carl-friedrich-gauss-prize (accessed 27 October 2023).

16 Asociación International Congress of Mathematicians, 'International congress of mathematicians MADRID 2006: dossier', at www.mathunion.org/fileadmin/IMU/ICM2006/offline/icm2006.mathunion.org/press/dossier/index.html#1 (accessed 27 October 2023).

17 Sanz-Sole *et al.*, op. cit. (12), vol. 1, p. 4.

18 Curbera, op. cit. (13), p. xv, emphasis mine.

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part of the World's Columbian Exposition. The opening address that year, 'The present state of mathematics', was delivered by Felix Klein and specified a distinct historicity for mathematicians, a historicity which suggested a process was under way, one very much to intervene against. 'A distinction between the present and the earlier period lies evidently in this: that what was formerly begun by a single mastermind, we now must seek to accomplish by united efforts and cooperation', he argued. 'Our mathematicians must go further still. They must form international unions'.[19]

Over a century later, the hallmarks of that first congress obtain – most especially the self-conscious historicity. ICM 2006 featured several 'cultural activities' alongside the usual plenaries and talks, including 'The life of numbers' (an exhibition of artefacts 'drawn from the world of culture' – Roman coins, pre-Romanic manuscripts, incunabula, Renaissance mercantile arithmetic books with the first recorded usage of the current arithmetic symbols, both celestial and terrestrial maps – offering visitors 'an account of ourselves, using numbers as a tool'), 'History of mathematical knowledge' (a bibliographical exhibition held by Universidad Complutense de Madrid in its Historical Library, one of Europe's oldest libraries, showcasing the development of mathematical science through sixteenth-century texts), and 'ICM through history' curated by Guillermo Curbera, which provided 'a visual chronicle of all the ICMs, emphasising their significance in terms of human endeavour and using the activities of mathematicians at the ICMs as a mirror in which history, culture, technology, fashion and changing attitudes were reflected'.[20] Far from the anti-historicism we often expect from STEM practitioners, the ICM radiated a strong sense of 'historical self-consciousness'.[21]

ICM 2006 also evinced a political awareness. Even setting aside the most blatant indicators – the presence and patronage of Bourbon–Anjou monarchs or the close to 150 press representatives and dozen or so television cameras that flocked to the congress proceedings – something very powerful was being demonstrated at the 2006 ICM in Madrid.[22] The event was saturated by a deliberate concern for power, the distribution of power, and of the political, at multiple scales: geopolitical, cultural – even concern over the politics of knowledge.[23] This isn't anti-politics; quite the opposite.[24] As far as scholarly communities go, the IMU checked all the requisite boxes required for an aesthetically liberal politics: diverse, global, cosmopolitan, filial, cultured, tradition-aware,

19 J.J. O'Connor and E.F. Robertson, '1893 International mathematical congress – Chicago' (January 2020), at https://mathshistory.st-andrews.ac.uk/ICM/ICM_Chicago_1893 (accessed 28 October 2023).

20 Asociación International Congress of Mathematician, 'International congress of mathematicians MADRID 2006: "The life of numbers" exhibition' (June–September 2006), at www.mathunion.org/fileadmin/IMU/ICM2006/offline/icm2006.mathunion.org/culturalactivities/numbers/index.html (accessed 30 October 2023); Sanz-Sole *et al.*, op. cit. (12), p. 9.

21 Computing historian Michael Mahoney, a formative figure in the field whom I will discuss more extensively, described this as a kind of 'historical self-consciousness' that he would often observe in practitioners – though one that is open to error, in his judgement. In a footnote, he adds, as though to demonstrate, 'One has to wonder about an article on software engineering that envisions progress on an industrial model and uses photographs taken from the Great Depression.' Michael Sean Mahoney, *Histories of Computing*, Cambridge, MA: Harvard University Press, 2011, pp. 35, 211.

22 Allyn Jackson, 'International congress of mathematicians 2006', *Notices of the American Mathematical Society* (December 2006) 53 (11), 1336–40.

23 Grigori Perelman, one of the two recipients of the 2006 Fields Medal ('the Nobel Prize of mathematics'), declined to accept. Though he wasn't the first recipient to do so, he explicitly expressed his dismay over the lax ethics in the international mathematics community. See Sylvia Nasar and David Gruber, 'Manifold destiny: a legendary problem and the battle over who solved it', *New Yorker*, 28 August 2006, at www.newyorker.com/magazine/2006/08/28/manifold-destiny (accessed 29 October 2023).

24 James W. Malazita and Korryn Resetar, 'Infrastructures of abstraction: how computer science education produces anti-political subjects', *Digital Creativity* (October 2019) 30, pp. 300–12.

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showing an openness and appreciation for interdisciplinary dialogue and specific tolerance of difference, but one that nonetheless echoes the kind of 'agonistic politics' implied in the nostalgic political fantasy writings of Fred Turner.[25]

ICM 2006's programme was carefully designed around three axial themes imagined by the programme committee to reflect 'the geo-strategic situation of Spain in history and in the world, in particular in relation to Europe'.[26] The premise was to position Spain as a meeting point for these three axes, as well as to build programming specific to the perceived needs of the mathematical community in each region (with Spain fulfilling the role of benefactor). The Latin American axis, 'which seeks to encourage participation from mathematicians belonging to countries in this region as a contribution to their development and to increase scientific collaboration', inspired new travel bursaries and financial aid to 'stimulate attendance from these countries and strengthen research relations, which, although they exist, are not as strong or as numerous as we would like them to be. There is still a great deal to do, and Latin America is a natural area of collaboration with Spain'.[27] In a similarly development-oriented vein, the Mediterranean axis imagined Spain as 'a bridge between Africa, the Near East, and Europe', and signalled 'the intention of increasing mathematical co-operation in this sphere'. Accordingly, the ICM convened a pre-conference, the Mathematics for Peace and Development School, which brought

> young mathematicians from Arab countries (including Palestine), [as well as] Latin America, Europe, and Israel [who] attended eight courses given at the Universidad de Córdoba by prestigious mathematicians from different countries. The aim was to draw attention to mathematics as an effective means of contributing to the progress of peoples, as well as its use as a universal language for mutual understanding among different cultures.

President de León contended that

> co-operation is not only a matter of sending medical teams or providing financial aid. It is also necessary to co-operate in research. Arab mathematicians are starting to appear in Spanish universities, some with grants and others who are here on a more permanent basis. This is something we want to encourage; they belong to countries that need this support.[28]

The European axis, a reflection of Spain's position in Europe, occasioned a lighter tone: it was signified by the choice of venue for the 2006 IMU general assembly, which was held in Santiago de Compostela, a UNESCO heritage site in Galicia and a historic destination for

25 For Turner, 'agonistic politics' becomes coterminous with the New Left: 'The New Communalists parsed this dilemma by fusing the technocentrism and celebration of knowledge and experimentation common to the cold war research world with their individual quests to create alternative communities. As they turned away from the agonistic politics of the New Left, the New Communalists turned toward what they imagined to be a world interlinked by invisible systems.' Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*, Chicago: The University of Chicago Press, 2008, p. 244. It's also worth noting that, commensurate with that ethos, the entire discussion of racial politics is designated less than one-third of a page in Turner's canonical text – a mention of the temporal overlap between the *Whole Earth Catalog* and the freedom struggles of the Panthers and AIM (American Indian Movement) and the anaemic attempts 'to deal with race'; racial politics for Turner is subsumed by 'questions of gender, race, and class', which in turn is subsumed by 'agonistic politics'. Turner, op. cit., p. 97.

26 Sanz-Sole *et al.*, op. cit. (12), p. 5.

27 Asociación International Congress of Mathematicians, op. cit. (16).

28 Asociación International Congress of Mathematicians, op. cit. (16).

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Catholic pilgrimage along the Camino de Santiago, or Road to Santiago, 'a channel for culture and science in the Middle Ages'.[29] In other words, what Spain felt it could offer the European mathematical community was a sense of history (historic *culture*, more precisely).

There's a lot to unpack with regard to the kind of STEM diplomacy that the ICM 2006 executive committee was trying to effect through its 'geo-strategic' axes, not to mention the absurd Eurocentric posturing of it all – although there is that, and that too is significant. That too has its topological likeness to frontier thinking and conquest. 'The violence and paranoia of the Inquisition', writes Charles Hirschkind, is 'alive and well in fortress Europe … The continuous erasure of this inheritance, its transformation into a museum piece by modern historical discourse, are ideological procedures designed to shore up Europe's temporal and geographic borders'.[30] Those topologies of conquest are finding new meaning in the context of contemporary pan-Europeanism: in 1987, the European Council inaugurated its Cultural Routes of the Council of Europe (CRCE) initiative by issuing the the Santiago de Compostela Declaration certifying the Camino de Santiago – the ICM's symbolic gesture to its European axis – as its first 'European Cultural Route'.[31] The CRCE programme was enabled by the 1954 European Cultural Convention, which authorized projects of common action 'designed to safeguard and encourage the development of European culture'.[32] Since 1987, the council has verified over thirty so-called cultural routes, the perimeters of which extend beyond the EU and into North Africa and the Middle East, to allegedly offer a model 'for transnational cultural and tourism management'.[33] This is, quite literally, a conservation scheme of roads white people once walked on, one that nonetheless finds coherence in an era of bordering regimes that abolitionist and migrant justice organizer Harsha Walia astutely terms 'an empire of [border] externalization'.[34] Imperial habits are hard to break.

During the opening proceedings of the ICM Madrid, mayor of Madrid Alberto Ruiz Gallardón openly declared, 'Under the auspices of the Crown, and in keeping with the scientific and cultural progress that this Institution has enabled in Spain, Madrid bears today the honour and the responsibility of being the world capital of mathematical science.'[35] The IMU's overture toward Latin American STEM communities that year is not an isolated gesture; it follows and is followed by a range of policies that strategically position Spain as a conduit for EU regional expansionism: the Ibero-American Summit, EU Regional Development and structural adjustment schemes, and multiple integration programmes that target Latin American intellectual communities – which includes the EU's Erasmus Mundus programme that launched in the same year as the 2006 ICM.[36] Mathematics

29 Sanz-Sole *et al.*, op. cit. (12), pp. 5, 7, 17, 27.

30 Charles Hirschkind, *The Feeling of History: Islam, Romanticism, and Andalusia*, Chicago: The University of Chicago Press, 2020, pp. 2–3.

31 The Council of Europe, 'The Santiago de Compostela declaration' (23 October 1987), at https://rm.coe.int/16806f57d6 (accessed 29 October 2023).

32 The Council of Europe, 'European cultural convention' (19 December 1954), at https://rm.coe.int/168006457e (accessed 28 October 2023).

33 The Council of Europe, 'Cultural routes of the Council of Europe programme', at www.coe.int/en/web/cultural-routes/about (accessed 28 October 2023).

34 Harsha Walia, *Border and Rule: Global Migration, Capitalism, and the Rise of Racist Nationalism*, Chicago: Haymarket Books, 2021.

35 Sanz-Sole *et al.*, op. cit. (12), p. 30.

36 Secretaría General Iberoamerica, 'Ibero-American summits', *SEGIB* (n.d.), at www.segib.org/en/ibero-american-summits (accessed 29 October 2023); Gabriele Tondl, *Trade, Integration and Economic Development: The EU and Latin America*, New York: Springer, 2008; Roberto Dominguez, *EU Foreign Policy towards Latin America*, New York: Palgrave Macmillan, 2015, pp. 41–2; Regina Cortina and María Teresa Sánchez, 'Spanish bilateral initiatives for education in Latin America', *PROSPECTS* (June 2007) 37, pp. 267–81.

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education has been a feature of this cultural neo-expansion since the early twentieth century.[37]

Spain's resurgent influence in its former colonial interests is not going unnoticed: this year, amid the first summit of (some of) the Americas the US has hosted since 1994, President Biden intimated plans for a migrant relocation agreement with Spain (alongside Mexico, Guatemala and Canada), who made commitments to 'expand labor pathways' to their country.[38] Replaying the all-too-familiar 'dynamics of capital accumulation, labor control, and citizenship regulation in relation to migration', the agreement promises to be doubly beneficial: Spain is able to address its low-wage labour shortage, while the Biden administration manages a brief respite from the Democrats' own intractable crisis, one driven by the contradictory drives of courting a disaffected middle-class immigrant voter base and its more fundamental commitment to a race-supremacist carceral border politics articulated through constantly updating technofascistic modalities.[39] The years 2006 and 2022 are inextricably bound.

As are the years 2006 and 1492. Recall once more the choice of venue for the general assembly, Santiago de Compostela – a 'crystallization' of ICM 2006's 'support for the European space of higher education and research'. Santiago de Compostela rose to prominence in the European imaginary in the second half of the eleventh century after the papacy took a colonial interest in the region, inspiring the forty-day siege and massacre of Barbastro in 1064: the 'crusade before the Crusades', which 'made manifest that French knights could reap substantial spiritual and material rewards by taking part in the wars in Spain', and established a decisive spiritual, political and economic template for the Catalan crusades and European expansionism more broadly.[40] The Camino de Santiago comprises a network of pilgrimage routes leading to the shrine of the Apostle James/

37 Michael J. Barany, 'Fellow travelers and traveling fellows: the intercontinental shaping of modern mathematics in mid-twentieth century Latin America', *Historical Studies in the Natural Sciences* (November 2016) 46(5), pp. 669–709.

38 Matt Spetalnick, 'Cuba, Nicaragua, Venezuela's Maduro government unlikely to be invited to regional summit – U.S.', *Reuters*, 27 April 2022, at www.reuters.com/world/americas/cuba-nicaragua-venezuela-maduro-government-unlikely-be-invited-regional-summit-2022-04-27 (accessed 29 October 2023); Stef W. Kight, 'Scoop: Biden set to secure historic refugee deal with Spain', *Axios*, 1 June 2022, at www.axios.com/2022/06/02/biden-summit-americas-spain-canada-immigration-refugees (accessed 29 October 2023); US Department of State, 'Joint statement on the meeting of the U.S.–Spain working group on Central America', 26 May 2022, at www.state.gov/joint-statement-on-the-meeting-of-the-u-s-spain-working-group-on-central-america (accessed 29 October 2023); White House, 'Remarks by President Biden at endorsement event for the Los Angeles Declaration on Migration and Protection', 10 June 2022, at www.whitehouse.gov/briefing-room/speeches-remarks/2022/06/10/remarks-by-president-biden-at-endorsement-event-for-the-los-angeles-declaration-on-migration-and-protection (accessed 29 October 2023).

39 Walia, op. cit. (34), pp. 76–81, 107, 178; Corina Pons and Belén Carreño, 'Worker shortage jeopardises Spain's EU-funded recovery plan', *Reuters*, 17 February 2022, at www.reuters.com/world/europe/worker-shortage-jeopardises-spains-eu-funded-recovery-plan-2022-02-17 (accessed 29 October 2023); Alex S. Vitale, *The End of Policing*, Brooklyn: Verso, 2021, 'Border policing'. On modalities refer to the crucial work and community research projects undertaken by the folks at Just Futures Law, Mijente, CA Immigrant Defense Advocates, Immigrant Defense Project, Detention Watch, California Collaborative for Immigrant Justice, and Community Justice Exchange, among others. Just Futures Law and Joe Rivano Barros, 'A virtual wall is Trump's wall by another name', *Electronic Privacy Information Centre* (25 February 2021), at https://epic.org/wp-content/uploads/privacy/surveillance/coalition/Virtual-Border-Wall-Coalition-Letter-Biden-Admin-Feb-25-2021.pdf (accessed 29 October 2023); 'Mijente: un eje político'; 'Immigrant Defense Advocates'; 'Immigrant Defense Project: Fighting for Justice & Human Rights for All'; 'Detention Watch Network', *Deten. Watch Netw*; 'California Collaborative for Immigrant Justice', *CCIJ*; Community Justice Exchange, 'From Data Criminalization to Prison Abolition' (March 2022).

40 Joseph F. O'Callaghan, *Reconquest and Crusade in Medieval Spain*, Philadelphia: University of Pennsylvania Press, 2013, pp. 24–7.

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Jacob/Yaqub, whose relics, at least in the eleventh century, were believed to be preserved within the Santiago de Compostela Cathedral – though this, too, is a locus for contested historiography.[41] The rituals of peregrination were enshrined under Roman rule but took on a specific significance in the eleventh century when history writing such as the *Historia Compostelana* and the historian Diego Gelmírez, the first archbishop of the Catholic Archdiocese of Santiago de Compostela, explicitly resurfaced the importance of St James to Iberian Christianity, as well as the significance of the shrine.[42] Pilgrimage to the area was first encouraged, then incentivized (and securitized through Church militia) as a political and legal technology, one that saw accomplishment in 1492 after the fall of Grenada to the expanding empire of Isabella I of Castile and Ferdinand II of Aragon. The Catholic Monarchs (*Reyes Católicos*) would issue the Capitulations of Santa Fe (entitling Christopher Columbus) and the Alhambra Decree (the Edict of Expulsion) that very year.

The year 1492 is before itself, too: as historian Felipe Fernandez-Annesto explains, the conquest of Upper Andalusia – the 'First "Atlantic" Empire' – prefigured 12 October 1492, 'when our Great Sorrow began'.[43] There is 'a tendency among historians of this subject to distinguish motives from means, as in popular detective fiction, and treat both as preconditions of European expansion', Fernandez-Annesto writes. 'While the motives were of long standing – indeed, it is hard to discern any "new" motives in the critical period – the means were of late mediaeval contrivance, and lay in the development of techniques of shipbuilding, navigation, and cartography. There is something in this analysis.'[44] These histories aren't just political; they're artefactual. The transmutation of medieval Spain into a frontier, and then from a frontier into an empire, is but one among many elementary reactions interred in this history: from the vow of taking the cross – its rituals and regalia – emerges a technology of martial professionalization; from a bureaucratic scheme intended to manage the distribution of non-combatant Crusaders emerge spiritual technologies of penance and commutation, which are then themselves transmuted into capital-extraction schemes to fund military orders – who themselves are a category of work that transmutes combat duties into finance through Templar banking operations. And this moment of history itself is also transmuted: from a set of practices and symbolic orders surrounding the Crusade industries into Martin Luther's 95 Theses.

What I want to emphasize here is how much ICM 2006, just this one space/place/object of analysis, is saturated with histories, and histories of many different kinds and qualities. And it's all wildly fascinating, not to mention immensely satisfying, to observe, connect, map and objectivize. You find yourself advancing from one object to the next, surgically excising new, different, other meanings, forcing the artefactual remains of material culture to disclose to you a truer essence. There's an absolute thrill to this mode of inquiry, so much so that I, too, am seduced by Peter Galison's appeal to 'relentless historicism'.[45] But then – that's just it, isn't it – in all this talk over papal bulls, sextants, martial uniforms and each transmutation (or innovation) that cascades over the next, we've left behind all historical awareness of (and accountability to) over five hundred years of holocaust.[46]

41 Louis-Marie-Olivier Duchesne, 'Saint Jacques en Galice', *Annales du Midi* (1900) 12, pp. 145–79.

42 Richard A. Fletcher, *Saint James's Catapult: The Life and Times of Diego Gelmírez of Santiago de Compostela*, New York: Clarendon Press, 1984, pp. 53–4.

43 Leonard Peltier, *Prison Writings: My Life Is My Sun Dance*, New York: St Martin's Griffin, 2000.

44 Felipe Fernandez-Armesto, *Before Columbus: Exploration and Colonization from the Mediterranean to the Atlantic, 1229–1492*, Philadelphia: University of Pennsylvania Press, 1987, p. 4. See also Lawrence J. McCrank, *Medieval Frontier History in New Catalonia*, New York and London: Haworth Press, 1996.

45 Peter Galison, 'Ten problems in history and philosophy of science', *Isis* (March 2008) 99, pp. 111–24.

46 Patrick Wolfe, *Traces of History: Elementary Structures of Race*, London: Verso, 2016.

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On mathematicians as exemplary anti-political, anti-historical subjects

Mathematics often plays a figurative role in criticism of AI and computing more broadly: recognizable attributes of mathematical practice (enumeration, discretion, abstraction) or mathematical operations ('vectorization, optimization, probabilization, pattern recognition, regularization, and propagation') function as a foil to describe both a predominant style of reasoning found within an ethnographic locale and the violence engendered by that style of reasoning (by virtue of either historical allegory or common-sense associations).[47] The indictment is bidirectional, implicating both the thinker and the thought, and often relies on (professional) philosophical treatments of instrumental rationality, binarism, quantification, and so on, to explain the connection.[48] On the occasion when computing is yoked to mathematics via its practitioners, what's implied is a cultural inheritance: a 'social culture', writes Meredith Broussard, wherein 'disciplines like math, engineering, and computer science pardon a whole host of antisocial behaviors because the perpetrators are geniuses'.[49] Computer science 'inherited the biases of the mathematical community', in Broussard's account.[50] Something quite specific gets lost in this formalization. There is a definite politics materializing at the ICM, something much more specific than bias, something diametrical to anti-politicism, and qualitatively distinct from 'neutrality'.

Neutrality is a frequent trope in critical humanist discourses about AI and its attendant domains.[51] Mathematics, we are told, is not neutral; neither are data and algorithms, code or technology.[52] And lest we forget, critics insist on reminding us that artificial intelligence 'is not an objective, universal, or neutral computational technique that makes determinations without human direction'.[53] These frequent castigations, given the obvious political consequence of computing as an industrial, intellectual and sociocultural practice, seem a bit bizarre. I've never met a technologist who truly believed this.[54] By that, I mean I've never encountered one who believed that their creative and cognitive

47 Adrian Mackenzie, *Machine Learners: Archaeology of a Data Practice*, Cambridge, MA: MIT Press, 2017, p. 16. For example, 'The problems with correlations are neither new nor limited to big data and weapons of math destruction, however. Based on eugenic reconstructions of the past and cultivated to foreclose the future, correlation contains within it the seeds of manipulation, segregation, and misrepresentation.' Wendy Hui Kyong Chun, *Discriminating Data: Correlation, Neighborhoods, and the New Politics of Recognition*, Cambridge, MA: MIT Press, 2021, p. 59.

48 The examples here are numerous, but to name a few: John Cheney-Lippold, 'A new algorithmic identity: soft biopolitics and the modulation of control', *Theory, Culture and Society* (November 2011) 28(6), pp. 164–81; Cheney-Lippold, *We Are Data: Algorithms and the Making of Our Digital Selves*, New York: New York University Press, 2017; Gina Neff and Dawn Nafus, *Self-Tracking*, Cambridge, MA: MIT Press, 2016; Deborah Lupton, *The Quantified Self*, Malden: Polity, 2016; Lee Humphreys, *The Qualified Self: Social Media and the Accounting of Everyday Life*, Cambridge, MA: MIT Press, 2018.

49 Meredith Broussard, *Artificial Unintelligence: How Computers Misunderstand the World*, Old Saybrook: Tantor Media, 2018, p. 75.

50 Broussard, op. cit. (49), p. 79.

51 Malazita and Resetar, op. cit. (24).

52 Cathy O'Neil, *Weapons of Math Destruction*, New York: Broadway Books, 2016; Justin Joque, *Revolutionary Mathematics*, London: Verso, 2022; Ruha Benjamin, *Race after Technology*, Cambridge: Polity, 2019; Stephanie Hare, *Technology Is Not Neutral*, La Vergne: London Publishing Partnership, 2022.

53 Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence*, New Haven: Yale University Press, 2021.

54 This is a claim grounded in my experience organizing on college and industry campuses with campaigns designed to interrupt the 'school-to-defence-industry-pipeline'. These efforts, which have gained momentum (such as the 2020 'Math Boycotts': Tarik Aougab, Federico Ardila, Jayadev Athreya, Edray Goins, Christopher Hoffman, Autumn Kent, Lily Khadjavi, Cathy O'Neil, Priyam Patel and Katrin Wehrheim, 'Boycott collaboration with police' (15 June 2020), at www.Math-Boycotts-Police.Net (accessed 29 October 2023)), are campaigns of persuasion: they require building a shared analysis around the domain of action, which in turn requires a deep

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efforts were in the service of crafting value-neutral general-purpose artefacts, and who maintained a strict agnosticism towards how these artefacts were embedded in the world. (Not to say such a person doesn't exist – just that I haven't met one.)

On the one hand, I think tech or AI 'neutrality' has become a marquee concept for humanists, an easy referent to describe a range of activities through which technologists deflect responsibility for the consequences of their work. On the other hand, I think something very interesting happens when the guild and its historians make this charge – a different kind of displacement, one that deliberately points towards the apoliticism (or ahistoricism) of the technologist and shifts focus away from the political investments of guild historians engaged in their own project of creation and conservation.

Making the history of computing

I took an interest in the IMU while tracing the pathway described by Liesbeth de Mol and Maarten Bullynck in 'Making the history of computing'. De Mol and Bullynck offer an 'internalist' history of computing history, 'a relatively young discipline, that formed slowly since the 1970s at a time when the discipline of computing itself was hardly established yet'.[55] The discipline emerged through an entanglement between three older traditions of history writing: history of mathematics, history of science and history of technology. This vocational inheritance is significant: from very early on, the assorted mix of academic communities invested in computing history had to contend with the invariable intellectual tensions that haunt interdisciplinarity. Some of these tensions were never resolved – the authors describe the 'distancing between the history of mathematics and computing', the result of 'a complex and at times strained relationship'.[56] They also highlight the formative influence of historian Michael S. Mahoney, who argued that the computer 'is not one thing, but many different things, and the same holds true of computing', as well its 'tripartite' and fundamentally contingent nature: an object stabilized through computer science, electrical engineering and programming/software engineering. According to de Mol and Bullynck, Mahoney nevertheless hedged his bets: 'To Mahoney, to get away from a machine and person centred history written by those who lived it, a turn towards the history of software and of computing systems would connect directly to many of the then-current issues in the history of technology'.[57] In doing so, Mahoney is described as the origin point of computing history's entanglement with the history of technology, a much more intellectually varied (not to mention politically ambivalent) history-writing community.[58]

Over time, as the intellectual investment in computing grew, the Society for the History of Technology (SHOT) and the SHOT Special Interest Group Computers, Information, Society (SIGCIS) became the route through which a wide range of actors

understanding of the beliefs and ideological commitments of the STEM students and practitioners we attempt to activate, mobilize and enter into community with.

55 I think it's fair to characterize de Mol and Bullynck as advocates of a traditionalist (or guild) historiography; the entire tone of this article is wistful: 'Practitioners of the field have become estranged from the history now being written, and the historians have adopted new methodologies, bringing in institutional, economic, and social motives … The computer then often appears as a blackbox that, supposedly, need not be understood to tell the story.' Liesbeth de Mol and Maarten Bullynck, 'Making the history of computing: the history of computing in the history of technology and the history of mathematics', *Revue de synthèse* (September 2018) 139, pp. 361–80, 363, 377.

56 De Mol and Bullynck, op. cit. (55), p. 362.

57 De Mol and Bullynck, op. cit. (55), p. 371.

58 Matthew Wisnioski, *Engineers for Change: Competing Visions of Technology in 1960s America*, Cambridge, MA: MIT Press, 2012.

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would come to articulate the history of computing: 'sociology, business history, gender studies and other disciplines have been integrated into the philosophy and methodology of computing historiography following methodological developments of the Society for the History of Technology', de Mol and Bullynck explain. Essentially, since the 1970s, computing rose to prominence in everyone's priorities, not just that of academics, making it an object of universal historical concern for researchers coming from multiple scholarly traditions. There's something quite troubling, however, about the story that historians of computing are telling themselves about their own history. It feels remarkably un-historicized. The objects of inquiry – science, mathematics and, especially, computing – are being treated as positivities, taken for granted, and their relation to historians as inevitable, even foreclosed.

There are, of course, other histories that the history of computing can trace for itself. The history of computing is a project of recovery. Like many topics that fall under the history of computing (war and martial science, scientific computing, information management, electrical engineering, and so on), computing is an object of inquiry that took on a strong stabilization in the present, thereby compelling a re-historicizing of adjacent historical fields.

Context as capture

I think guild historians cede too much ground to reactionary historiography by reducing the disciplinary debates around how to properly historicize computing and artificial intelligence – and euromodern technoscience more generally – simply to questions over 'context'.[59] The long-standing discussion around 'context' was recently described by Janet Abbate and Stephanie Dick in their introduction to a collection on computing history, but it's been made before, many times.[60] It's the first of Peter Galison's provocations in 'Ten problems in history and philosophy of science'.[61] Galison, who is trying to ford the gap between history of science and philosophy of science (a more consolidated field outside the US academy), refers to context (which he freely admits is an 'elusive explanatory structure always invoked, never explained') as the non-textual environment through which scientific knowledge is stabilized and expressed: the political, institutional, industrial, ideological, and so on. Where this gets tricky is when *context* becomes a synecdoche for *politics*. For 'context' is, by all accounts, just an epistemic device historians administered to resolve the invariable disciplinary tensions that arise when a lot of different people, coming from different intellectual traditions, take an interest in historicizing the same artefact – i.e. the legislative after-effect of an 'intellectual civil war'.[62]

Consider, for instance, how Mahoney distinguished between what he sees as his work, as a computing historian, and what he dismisses, somewhat flippantly, as computing literature which serves the functions of 'social analysis, criticism, and commentary' as 'popular accounts taken uncritically and episodically to support non-historical, often polemical, theses. Some of this literature rests on a frankly political agenda; whether its models and modes of analysis provide insight depends on whether one agrees with that agenda'.[63] The demarcations here are alarming, especially given Mahoney's formative role in how computing historians understand their object of study and how forcefully

59 Trouillot, op. cit. (7), pp. 19–22.

60 Janet Abbate and Stephanie Dick, *Abstractions and Embodiments: New Histories of Computing and Society*, Baltimore: Johns Hopkins University Press, 2022, p. 5.

61 Galison, op. cit. (45).

62 Galison, op. cit. (45), p. 112.

63 Michael S. Mahoney, 'The history of computing in the history of technology', *Annals of the History of Computing* (1988) 10, pp. 113–25, 115.

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they've expressed the desire to politicize their work against 'inequalities of gender, race, class, religion, and body'.[64] Even if guild historians wholly refuse the categories Mahoney prescribes – 'social,' 'uncritical,' 'non-historical,' 'polemical,' and so forth – there's the inescapable reality that the historiography – the cultivated practices of historical observation, thinking and writing – itself prefigures the target and means for intervention.

There is a case to be made that, for computing historians, history itself has been rationalized bibliometrically: a throughline from George Sarton's 'arsenal of cards', through Bernard Cohen's archive of clever devices, through Kenneth O. May's collection of 'history slips', through the computer itself taking form in the historiographic imaginary of Mahoney as he disinterred the various technical and intellectual pluralities invested in this device, only to repatriate them under 'computing'.[65] There are serious risks to politicizing this mode of history writing. Debating 'context,' in that case, has narrowed the entirety of computing historiography down to governing contingency – a scholarly debate between what are (or are not) the determinant conditions of a technical artefact's emergence. That, not history, and certainly not 'politics', becomes the expert offering that guild historians have positioned themselves to resolve.[66] What's more, if 'context' – i.e. qualitative and quantitative representation within a stack of cards – becomes the 'obligatory passage point' within your 'program of investigation', then, in lieu of solidarity, those made vulnerable by 'inequalities of gender, race, class, religion, and body' are faced with yet another dynamic of power that undermines the extent to which their truth can circulate.[67]

In other words, those histories, the historical knowledge of those made vulnerable by US empire and its various death-making programmes (which most certainly includes computing itself) – that history becomes trapped in the vignettes fashioned by and for the guild. Thereby they – we – become subject to what's effectively a politically agnostic mechanism on which we now must hedge our liberation. This requires deep consideration on the part of guild historians – to take seriously what Ann Stoler describes as 'an appreciation of historiography as a political force', that history writing is itself a 'political act', and that historical narrative can act both as 'a tool of the state and as a subversive weapon against it'.[68]

64 Thomas S. Mullaney, 'Your computer is on fire', in Mullaney *et al.*, op. cit. (5), pp. 3–9, 6. Mahoney's posture is a familiar one for guild historians who, Foucault writes, often 'take unusual pains to erase the elements in their work which reveal their grounding in a particular time and place, their preferences in a controversy – the unavoidable obstacles of their passion'. Michel Foucault, 'Nietzsche, genealogy, history', in Foucault, *Language, Counter-memory, Practice: Selected Essays and Interviews* (tr. Donald F. Bouchard and Sherry Simon), Ithaca, NY: Cornell University Press, 1977, pp. 76–100.

65 Sami Hamarneh, as quoted by Aydin Sayili: 'It is hard to explain the scope of his [George Sarton's] scholarly research … [consulting] some 3,100 books, 4,000 booklets, monographs, and reprints, and about 41,000 bibliography cards. By 1947 "the arsenal" had grown into 3,400 books, 13,500 pamphlets, and 80,000 cards and other documents.' Aydın Sayili, 'George Sarton and the history of science', *BELLETEN* (April 1983) 47, pp. 499–526; Kenneth Ownsworth May, *Bibliography and Research Manual of the History of Mathematics*, Toronto: University of Toronto Press, 1973, p. 21. See Figure 4, diagram entitled 'The communities of computing', in Mahoney, op. cit. (21), p. 62.

66 Hicks, op. cit. (5), p. 11.

67 Michel Callon, 'Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay', *Sociological Review* (May 1984) 32, pp. 196–233. 'Made vulnerable' is a corrective to the phrase 'vulnerable communities', denoting the deliberate and specific way communities face vulnerability-by-design: how the carceral violence carried out by immigration enforcement works productively to discipline workers, suppress workplace organizing and cheapen the cost of labour. Credit and gratitude go to the folks at IDEPSCA for this insight: 'Instituto de Educacion Popular del Sur de California', *IDEPSCA* (2018).

68 Ann Laura Stoler, *Race and the Education of Desire: Foucault's History of Sexuality and the Colonial Order of Things*, Durham, NC: Duke University Press, 1995, p. 62.

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If there is one thing to take away from the self-referential scholarly writings of historians of science (or mathematics, technology and computing), it's that Euromodern reason should never be understood as just that. Instead, it was (and continues to be) a complex latticework of provincial rationalities: a bundle of epistemic localities, stacked on top of one another in a way that perpetuates its own advance through the circulation of myths such as 'criticism', 'mechanical objectivity', 'tolerance', 'system' and, ultimately, a reactionary dialectics of knowledge. History writing is saturated with political potentials, and not necessarily the selfsame politics invoked by guild historians. Euromodern history writing – as with Euromodern empirical and experimental science, Euromodern material culture and Euromodern practices of symbolic storage – is, after all, just one tradition grafted over many.[69] There are, and have always been, other historiographies. And despite the epistemic displacements imposed on these knowledge traditions by Western colonialism, these modalities of historical awareness become inescapable for we-other-moderns.[70] They impress upon the present a tacit confidence in the political efficacy of history writing in ways that cannot be reduced to Nietzsche, Marx or Brooks – but nonetheless conspire with these articulations to evoke the desire to produce 'effective' histories.[71] But conspiracy, no matter how closely it resembles a shared political objective, can't be relied on. Conspiracy, too, is capture.

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69 Jim Al-Khalili, *The House of Wisdom: How Arabic Science Saved Ancient Knowledge and Gave Us the Renaissance*, New York: Penguin Press, 2011, Chapter 3, n. 71; Arjun Appadurai, *The Social Life of Things: Commodities in Cultural Perspective*, Cambridge: Cambridge University Press,1988; Colin Renfrew, Christopher Scarre and McDonald Institute for Archaeological Research, *Cognition and Material Culture: The Archaeology of Symbolic Storage*, Cambridge: McDonald Institute for Archaeological Research, 1998; Muhsin Mahdi, *Ibn Khaldûn's Philosophy of History: A Study in the Philosophic Foundation of the Science of Culture*, London: G. Allen and Unwin, 2015; Georg G. Iggers, Q. Edward Wang and Supriya Mukherjee, *A Global History of Modern Historiography*, Harlow: Pearson Longman, 2013; see also Daniel Woolf's article 'Historiography' in Maryanne Cline Horowitz (ed.), *New Dictionary of the History of Ideas*, New York: Charles Scribner's Sons, 2005, pp. xxxv–lxxxviii; which replaced the 1973 entry by Herbert Butterfield in P. Philip Wiener (ed.), *Dictionary of the History of Ideas*, New York: Scribner, 1973.

70 'Western' in the sense of Raymond Williams, who writes in *Keywords* that 'the West (to be defended) is notoriously subject to variable geographical and social specifications'. For Williams, 'the West' is a historical category, not a geographical construct. Raymond Williams, *Keywords: A Vocabulary of Culture and Society*, Hoboken, NJ: Taylor and Francis, 2014, pp. 264–6; see also Mohammad R. Salama, *Islam, Orientalism and Intellectual History: Modernity and the Politics of Exclusion since Ibn Khaldun*, London: I.B. Tauris & Co. Ltd, 2013, pp. 27–26; Mohammad H. Tamdgidi, George Ciccariello-Maher and Ramon Grosfoguel, *Conversations with Enrique Dussel on Anti-Cartesian Decoloniality & Pluriversal Transmodernity*, La Vergne: Ahead Publishing House, 2013.

71 Foucault, op. cit. (64); Karl Marx and Friedrich Engels, *The German Ideology: Including Theses on Feuerbach and Introduction to The Critique of Political Economy*, Amherst, NY: Prometheus Books, 1998; Van Wyck Brooks, *Van Wyck Brooks, the Early Years: A Selection from his Works, 1908–1925* (ed. Claire Sprague), Boston: Northeastern University Press, 1993.

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