Andrew Culp (with Anirban Baishya)

Data, Media, Ethics: A Conversation with Andrew Culp

"Networks are not just for the counter-culture anymore, they are how the military plans war, companies do business, and governments cast their influence."

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Anirban Baishya (AB): The term "big-data" gets thrown around almost as if it were a magical thing. But, as Craig Dalton and Jim Thatcher put it: "'Big data' has big precursors, earlier knowledges that set the stage and helped define the nature and needs that present-day 'big data' realizes." So, what exactly is different about big data (or what's the BIG in big data)?

Andrew Culp (AC): Big Data is an intensification of our "information society," as it has been called since the 1960s. But as you say, it has many precursors. One way to locate its antecedents is to follow Foucault's inquiry into "what has counted as truth?". And more specifically, the practices of knowledge production that he called veridiction. But whereas in Foucault's time, marketing firms previously employed psychoanalysts to divine the unconscious desires of the masses, today, information analysts now coax out patterns that can only be seen from inside a dataset. Putting it in another way: isn't the promise of Big Data just a new speaking subject after the Death of the Human?

In his lectures on neoliberalism, Foucault finds a curious moment in the middle of the eighteenth century when economics transforms from being a moral philosophy to a science of government as the Physiocrats argue for the connection between value and price. The consequence is more than a data-driven approach to commerce, it constitutes a science in which the market speaks a truth that verifies governmental practice. Perhaps even more importantly, this is also the time of Adolphe Quetelet, father of "social physics" and the birth of *l'homme moyen* ("the average man"). The point I am making is that when looking at the history of data, of course one will find devices for producing knowledge, but upon close inspection, there will also be a whole theory of truth.

Flash forward to today, and I would like to ask the same type of questions. Drilling down into the information society would lead one to the contemporary "truth-telling" power of Big Data: the formalization of the positivist social sciences (at the expense of other forms of expertise), the triumph of behavioralism with its accompanying theory of the subject, and computation along with its mode of problem-solving. The post-war Keynesian fantasy was automation, with the machines doing all the work. Our post-crash Neoliberal fantasy can no longer imagine a world without work—or to repeat that slogan from the '70s that has become even

more popular today: it is easier to imagine the end of the world than the end of capitalism. Perhaps we are already in that very apocalypse, a world of Big Data where the machines do all the thinking. There, human interpretation is no longer necessary because copious amounts of data are readily available and self-transparently true—a veritable libertarian technocratic fantasy.

But before I oversell the idea, it is equally important to note that there are already quite a few chinks in its armor. The social sciences are currently going through a reproducibility crisis, aided in part by Big Data. The trick of machine learning is found in its ability to locate interesting patterns. But as recent scandals have revealed, *those patterns often express a quality of the dataset and not the reality on which they are meant to be modeling*. The problem that arises here is not one of true believers but of dependency. To specify, it is not just the information processing problem of "garbage-in, garbage-out," it is the result of privileging forms of knowledge that can be only be produced through certain technical means—here, I'm thinking of systems where the "truth" of a process begins to overwhelm any single actor's ability to override it, as with Terry Gilliam's *Brazil*. This is perhaps the greatest social risk of Big Data: even in instances where it is completely unreliable, it continues to be used because of dependence on the kind of truth it speaks.

AB: So, what changes when the rhetoric of big-data slips into our everyday, habitual use of networked technologies and what consequences does big data have for our larger understanding of media culture in the present?

AC: Here's one idea that continues the Foucauldian line of thought that every society has analogies it takes as the foundation of truth. Genetics has long served this role, with everyday people arguing that something must be true "because it's in my DNA"— which they mean both literally and metaphorically, sometimes at the same time. It becomes perfected in the television show *CSI*, whose forensic science became so convincing to general audience that it led to a measurable "CSI-effect" in real trial juries who expected all detective work to be as equally persuasive. As Big Data becomes similarly self-miraculating, people will commonly lean on it in everyday thinking. Not only will it act as a virtual subject, with "the algorithm" suggesting to them people to date, books to read, or jobs to work, but a means to discuss the truth about healthcare, manufacturing, policing, transportation, education, and science.

AB: What media objects would we not have without Big Data? Over the past years, Variety has held Big-Data Summits and platforms such as YouTube, Google, Facebook and Netflix routinely collect user data to predict user preferences through algorithms, or to target ads. Is "big-data" a vehicle for other media, or are we at a point, historically, when we can think of data itself as a media-form?

AC: A lot of true Big Data is never seen as so much of it is proprietary information internal to the corporate world, sensitive information protected by government privilege, or research data never used by more than a fewer researchers. When translated from the database into something more appropriate for humans, it is most often represented through graphs, charts, or maps—still one of the areas driving Big Data is climate change research. Though many of their datasets are not big enough to technically be Big Data, there is a media whose history is intimately tied up with it: Geographic Information Systems and geo-spatial research more broadly. Exemplary projects include Million Dollar Blocks.

But in terms of the entertainment industry, which seems more central to your question, Web 2.0 has given us even weirder Big Data-adjacent media, such as Instagram star Lil Miquela, the chatlogs of racist Microsoft chatbot Tay, 23andMe genetic analysis, interactive surveillance maps, psychedelic DeepMind images, Deepfake and other AI-generated faces, and more. If one expands the category to include all media that exists only through the network-massification effect of the web, it would include meme aesthetics, social media-specific discourses & subjectivities, video game narrative logic, streamer video conventions, crowd-funded retro reboots, and much more. And finally, there is a whole category of media that preexists Big Data and the web but is marketed as new. Journalists have very recently talked about how self-styled visionaries have appropriated gendered

media like the Slimfast diet shake through products like Soylent as essential components for efficient "biohacking," with its accompanying analytics of counting, measuring, representing, and modifying behavior. Most remarkable is how close the convergence is for a doctor's diagnosis for disordered eating and the data analytics of the quantified self.

What is new about Big Data's role in all of this? As you say: prediction. But also, extrapolation. This is something Artificial Intelligence and Machine Learning gets from its forefather, cybernetics. Cybernetics was itself born from the mind of MIT mathematician Norbert Wiener, who was working on automatic anti-aircraft guns during World War 2. Media makers are using data-driven techniques to similarly target audiences. It works on a few different levels. Identifying trend lines is the core of Web 2.0 business model for companies looking to monetize collecting data, which sell to information brokers like Acxiom. This is the bread-and-butter of free web services, from tax preparation to Facebook. Riding the trend lines is also a major strategy, as seen in Netflix and Amazon's big gamble as they have aggressively expanded into content production as well as the proliferation of jobs in social media marketing and search engine optimization. In the realm of television production, the replacement of the Nielsen Family by the Netflix User is a shift on the scale of the transformation from Fordism to just-in-time production.

Perhaps an even more profound shift has been around content production on the internet. The early web in the 1990s was not seen as a place primarily for commerce, but instead, for free expression. Concepts of the global village, the public square, or the town hall were circulated without irony. Not that I agree with these ideas, but they aptly define many users' experience dialing into BBSs, telnetting into MUDs, posting to USENET groups, and trawling other forgotten corners of the internet. Even the dot-com boom and bust did not seem to really dent things too much.

The shift comes with Web 2.0's formalization in the late 2000s, with the *spirit of free expression being converted into a well of free labor*. A series of websites that we would later call "platform as service" suddenly become incredibly successful, namely Facebook and YouTube. (A less talked about dimension of this story is how Web 2.0 was prefigured by lefty development as part of the anti-globalization movement, such as Indymedia or how the underlying model for Twitter came from the SMS-based protest app, TXTMob). As this early generation of Web 2.0 companies evolved and responded to venture capitalist demands for coherent business models, their roles clarified: they were landlords of a new sort. But instead of demanding rent, they monetize user-generated content in return for use of their site as a "platform." As this monetization started driving the priorities of more users (formal and informal), so changed the type of content that they produced. Fortunately, the web is still a chaotic enough place that the profit motive does not drive everything, but it is influencing more and more the type of content that is being produced. For example, because of the massive amount of money being poured into the "alt-light" (Ben Shapiro, Jordan Peterson) right now, my YouTube recommendation system is full of their videos—I assume it is because of the research I have been doing for the class I have been teaching on leftist radical politics. But as I mentioned before, it is all black-boxed under the auspices of being proprietary information, so I will never know why.

AB: In light of the recent controversies involving Facebook and Google and their data-collection and management practices, how do you envision the role of the state and civil society? Is state intervention necessary for mitigating concerns around data ethics? Can legal measures ensure an ethical use of data?

AC: Broadly speaking, government has the capacity to regulate the internet but *chooses* not to do so. The regulatory history of the internet in the United States has to be understood in the larger context of telecommunications development. It was initially the product of Cold War science, which turned science away from patronage to become a national project with all of the resources, legitimacy, and priorities that entails. (One big reason why I am skeptical of appeals to re-nationalize telecom, as they would obviously serve the interests of the security state—China is already using cutting-edge tech to brutally repress the Uighurs, now including biotech, and it was reported a few days ago that Family Tree DNA has given the FBI access to its

database.) The web comes of age during an era of mass deregulation, with major changes beginning with the creation of the "Baby Bells," bookended a decade later with the 1996 Telecommunications Act. Its lack of regulation is not so much an inability for regulators to keep up with the pace of innovation, but as part of a larger move to shift how we think of communication from a public good to a private commodity.

It is really important to combat the Silicon Valley mythology of guys tinkering in their garages. That is just part of the libertarian imaginary of the internet that has been criticized by Fred Turner and the classic "Californian Ideology" essay from *Mute*. Not only does the myth further encourage hero worship of people like Bill Gates and Steve Jobs that would make even Ayn Rand blush, but it is a major cause behind some of the scariest aspects of today's net culture. The rather marginal perspective of crypto-anarchism—which, I should note, is a total abuse of the label proudly worn by the likes of Lucy Parsons and Emma Goldman—has mainstreamed its extreme right-wing libertarian ideas under the aegis of technical products, such as cryptocurrency. So to flip the script, the issues caused by the internet are not due to a lack of government involvement, but an explicit government project to use human communication as a site for capital accumulation.

In my estimate, none of these issues will be adequately addressed through the mode of the liberal legal subject (namely: privacy), and more broadly, the capitalist principle of property ownership. This is why I have hitched my own trailer to outsider protest groups. I see my role as agitating rather than reforming. This puts me on the side of those who smashed Google buses in the Bay Area, worked to sabotage Amazon's HQ2 in New York, and countless other actions worldwide. There is also a practice dimension, such as throwing crypto-parties to teach people opsec, encourage wider anti-capitalist tool use, and other forms of tactical sabotage. On that count, a good place to start for a beginner would be Brunton and Nissenbaum's recent *Obfuscation: A User's Guide*.

AB: So, what's the role of the big tech corporations in this? We use their devices and platforms almost daily with the full knowledge that our personal data may (and most likely will) be collected, tracked and used. What are the trade-offs in terms of surveillance and tracking?

AC: There are a few legitimately evil people running tech companies, such as real-life vampire Peter Thiel and his Palantir Technologies. I am far more intrigued by corporations like Google or Facebook that honestly think they serve the public good. Or to put a point another way, why did Mark Zuckerberg look so out of his mind in front of Congress when it could have been his shining moment? (Memes depicted him as wearing David Byrne's big suit, but perhaps even more telling, as Data from Star Trek.) One might wonder, then, how is it that everyone at Facebook genuinely believes that they are there to help?

There is a running joke in the first season of the HBO satire *Silicon Valley* about tech company social missions. "Making the world a better place through minimal message-oriented transport layers […] We're making the world a better place through scalable fault-tolerant distributed databases with ACID transactions […] But most importantly we're making the world a better place through constructing elegant hierarchies for maximum code reuse and extensibility." The unexpected mixing of hyper-specific tech and a broad social mission lends itself to a cynical read: that tech companies should stay in their line and stick to doing what they do best, engineering tech. But it is possible to find a few more incisive observations. First, that tech companies tend to have an engineering mindset that prioritizes the technofix. When they are given a seat at any table, they contribute a pair of things: a diagnosis driven by data-based analytics, and a prescription based in introducing new tech (One Laptop Per Child, a floating artilla of wi-fi balloons over Africa, iPads for school kids). Second, that tech companies are often solutions in search of a problem—it is just a matter of fact that technical innovations now precede applications, with the patent office backlogged with applications for things no one ever plans to put into production because they have no use. And third, they do not see collaboration with government or corporations as betrayal. This might be the most puzzling, as it seems to run counter to the mythology of the early internet. But I think it reveals something about the big tech unconscious, that their ultimate aspiration

is not just to work alongside government but to replace it (with them as head technocrat).

The rise of big tech has resulted in a new form of governmentality. They have a refined organizational practice, and they seek to influence a wide range of social issues. In their own perspective, then, they have a robust ethics—hence the now-routine practice of public apologies after data breaches (always sporting their goofy logo and written in faux-personal tone). Of course, it is wildly anti-democratic, as its decision-making structure is as opaque as Facebook's content moderation, which is to say, completely opaque. This model fits into the contemporary paradigm whereby governmentality is being shifted from sovereign institutions tasked with social welfare to a proliferating multiplicity of non-state entities. If one wants to change education standards in the US or globally, one's single most important meeting would not be with Betsy DeVos in the Department of Education but someone at the Bill and Melinda Gates Foundation. And what do these big tech companies have to add to social issues? A lot, it turns out. Google is not alone in imagining itself as a major player in global development. Many even see their methods as too "innovative" to be engaged in the usual practice of consulting current stakeholders and already-existing experts. Rather, following typical techie solutionism, they would implement a technical fix. And if it goes wrong or is too disruptive, then it is on others to clean up the mess.

There have been attempts to create alternative media based on different principles. Every year or so, a new social network gets promoted as a new platform that "actually puts the user first" or simply "protects your privacy." But they always flop. Google even recently pulled the plug on Google Plus, their Facebook alternative. One could speculate on the success of certain platforms, and there is definitely demographic segmentation—Gen Z prefers ephemeral media to Facebook, black youth used Myspace after others left. But even talking about it like that still uses the attention economy as the metric for success. Bigger questions still loom over what ten years of smartphones have done to us in the deep anthropological sense. How has it changed us? And is it for the better? Society displaces a lot of its larger anxieties onto children. And if the new parenting trend in Silicon Valley is a complete ban

on interactive screens, it sends a strong signal that everyone should read, especially with my students reporting using their phones for six or more hours a day. The meditation crowd has been pushing social media diets. But maybe it is time to consider a permanent break.

AB: Such pervasive presence of big-tech corporations has led to a set of more widely shared practices (and problems) on a global scale. Has platform capitalism diluted older forms of nationalism or state power, or has it transformed the very genetic material of these structures? And here, one could think for instance, about the recent global resurgence of right-wing populism in the United States, India, Turkey and Philippines. How do data cultures enable or reshape these political forces, and what role does data-enabled media play in this resurgence?

AC: I remember the putative "Twitter Revolution" of Iran around the 2009-2010 election. Not long after, I attended some tech workshops with Syrians living stateside. They were looking to educate themselves and their families back home on how to use proxies to get around censorship. I think these are all quite common stories now, which have been latched onto by civil society. Now you have global NGOs doing Cold War-style "democracy promotion" through the paradigm of connectivism, which is to say, using the web's information, social connections, and resources to promote liberal capitalist democracy.

A keystone example of this 2013 book *The New Digital Age: Reshaping the Future of People, Nations, and Business*, co-written by then-CEO of Google Eric Schmidt and policy wonk Jared Cohen after they met in Iraq do to "nation-building." Cohen was working for Condoleezza Rice, a key figure for introducing social media "into her diplomatic toolkit." Through his work with Schmidt, Cohen would then join Google to run their wing dedicated to influencing global geopolitics by encouraging free expression, combating censorship, providing access to information, and "countering extremism." The post-political framework in which these ideas are presented is crucial for understanding its purpose. What looks at first glance like democracy and civil society is, upon closer inspection, a renewal of older colonial projects working to replace impediments

to new regimes of capital accumulation. A simple global political economic analysis reveals how these tech tools prepare populations to serve in the next generation of low-income telecommunications jobs. There has already been considerable attention paid to the horrible conditions of the digital device manufacturing cycle, beginning with the mining of Coltan in the Congo, continuing with the assembly by workers at Foxconn, and dirty e-waste industry of China. But the data angle still needs its spotlight. Adrian Chen has done fantastic reporting on the armies of people in former colonies who have been hired to work in digital sweatshop-like conditions for their former colonizers. Every stop in the circuit of data production, circulation, and consumption includes hidden actors, all of it following an intensified division of labor.

Your question about the genetic structure of data-based approaches to politics is also quite interesting. I am deeply ambivalent about the current Russiagate discussion. Focusing on if campaign posts were coming from St. Petersburg, Russia and not St. Petersburg, Florida conveniently dodges the question of *how* they were able to influence the election. On the rare occasion the content of the online material is discussed, the most frequent example pointed to is fake Black rights groups said to be "exploiting racial divisions." Think about that for a moment. What are they actually saying? That Clinton would have won if only American racism was better hidden?

In that regard, I agree that Brazil, India, and the Philippines have more to offer. In large part because the chosen channel for spreading political content for them tend to be WhatsApp messages, and few people would propose moderating those types of chats. The message sent there tend to be rumors meant to whip up frenzies reminiscent of peasant revolts, religious riots, lynch mobs, and vigilante violence. There tend to be two responses, either technical quarantine or calls to return to some logic discourse (whether that be logical, civil, or expert-based). Both treat the conspiratorial discourses of net culture as a deviation. But what if it is not an aberration? For all the talk about "fake news," there is so little analysis on *why* people prefer it to fact. Why fiction is more powerful than the truth. My intuition says that machine learning based-Big Data approaches will only exacerbate this, as its mode of logic is promiscuously associative. Consider yourself warned about conspiratorial web discourses. You think this is bad? You ain't seen nothing yet.

AB: What are some of the pitfalls (or advantages) of the integration of big-data terminology and approaches in the academia and how you negotiate these turns in your research?

AC: My answer is colored by my position as a humanities-based critical media scholar working at an art school, but I am most interested in fiction, creation, and subterfuge as modes of inquiry. Data-driven methods can aid in this process, but not in the ways that are usually supported by Big Data. My current research is interested in creative uses of data not to perfect, but to corrupt, silence, or disconnect ourselves as an art of refusal.

Big Data is suffering an enormous hangover in the humanities. There has been incredible outside financial support for it, and a few top-tier research schools dumped a lot of money into it. But after a series of headline-catching scandals and failure of robust grad/post-grad support translating into corresponding tenure-lines, its institutional existence is in question. To even use the label "Big Data" may have been an abuse of the term, as we tend not to have access to the corporate, governmental, or scientific datasets that carry the name. Moreover, the strongest applications for data are in libraries and museums, in their collections and archives as well various forms of data curatorial including interactive maps. But as a form of analytics in which data provides new, unexpected, or otherwise-impossible to obtain results? Examples are elusively far and few between.

To put an optimistic spin on it, maybe we do not yet know what data can do! In *Language of New Media*, Lev Manovich argued for a new basis for new media art. Rather than producing new data, perhaps all art has to do is develop new interfaces for an already-existing database. There are wonderful examples of this from bioart to digital artists doing expected transcodings of inputs. A few weeks ago, my program hosted the art group Disnovation whose last 10 years of experiments express our evolving interest in data in art, such as Cold War concerns over intercontinental missiles (*War-Zone*), peer-to-peer filesharing (*The Pirate*

Cinema), government censorship (*Blacklists*), and machine-generated propaganda (*Computational Propaganda About Computational Propaganda*).

AB: Does some of this feature in your classroom? How do your students receive these ideas and what are some of the struggles or successes you have had in the classroom in relation to this?

AC: Previously, I taught at a science school. It was hard for students there to consider the ethics of data projects of their own; there was a common belief that they should check their own ethics at the door to find work in the industry. The approach that ended up being most successful was media literacy as it allowed me to smuggle in a broad cultural studies approach. But I am very skeptical of media literacy as a paradigm, which hitches itself to a post-political form of good citizenship. It seems obvious to me that the net has always been a place of partisanship, and attempts to hold the center by neutralizing intensities is the disavowal of politics. My favorite class to teach right now is "Evil Media." It is well suited to arts students, who are expected to cultivate a point of view as a necessary part of their creative practice. I take the title from a piece in Jussi Parikka and Tony D. Sampson's *The Spam Book*, in which Matthew Fuller and Andrew Goffey outline a series of strategies for how to do "evil media studies." The point is not an adjudication of technology that uses the classroom as a courtroom to determine whether or not media is good for humanity. Rather, the class develops a series of strategies on how to approach media that may be hostile to our interests. An outgrowth of this is a Facebook group that I have been running called "Evil Media" that I would encourage *Spectator* readers to join.

Another teaching-based theoretical line I have been mining is a reassessment of tactical media. The central research questions are: what is tactical media after Web 2.0? What were the principles of structure of the internet that motivated it in the 90s, and how have they changed between then and now? Briefly, I would say that the collection of artists, activists, and scholars who made up tactical media were riding high on the first wave of commercially-available digital electronics and lofty ideas about participation. In the interim, the ubiquitousness of those devices are now often the problem and participation is a means of enrollment in capitalist enterprise.

AB: So what needs to change?

AC: I think it is less about building things from the ground up, e.g. not everyone needs to be running a server in the basement or building their own computer from mail-order components. Rather, with the centralization of services through corporate platforms, exploits have become even more necessary. At the top level, it also means being less of a proponent of the net and networks. Networks are not just for the counter-culture anymore, they are how the military plans war, companies do business, and governments cast their influence. The alternative is not an abandonment of tech but to use the ubiquitousness of consumer technology. Sometimes it is using low-tech, whatever that might mean, but also jamming the forced march of innovation to reclaim other senses of space and time.

Notes

1 Craig Dalton and Jim Thatcher, "What Does a Critical Data Studies Look Like, And Why Do We Care?," *Society and Space*, May 12, 2014, Accessed December 11, 2018, http://societyandspace.org/2014/05/12/what-does-a-critical-data-studies-look-like-and-why-do-we-care-craig-dalton-and-jim-thatcher/#

2 Michel Foucault, *The Birth of Biopolitics: Lectures at College de France, 1978-79*. Ed. Michel Senellart, Tr. Graham Burchell (Basingstoke, New York: 2008).

3 Ibid. 30-32.

4 Million Dollar Blocks is a project undertaken by the Spatial Information Design Lab and the Justice Mapping Center that uses data from the criminal justice system to create maps of five major cities in the United States. It explores the predominance of the prison in many communities and neighborhoods, often at the cost of larger infrastructural needs and welfare. The title of the project draws from the fact that "states

are spending in excess of a million dollars a year to incarcerate the residents of single city blocks." See http://spatialinformationdesignlab.org/projects.php%3Fid%3D16, Accessed February 25, 2019.

5 See Maria Sherman, "Don't Be Fooled by Extreme Fasting," *Jezebel*, February 22, 2019, Accessed February 23, 2019, https://jezebel.com/dont-be-fooled-by-extreme-fasting-1832787660

6 "Baby Bells" refers to the seven regional telecommunication companies formed by splitting AT&T in 1984, following *United States v. AT&T* antitrust suit filed by the US Department of Justice against AT&T. For more details see Will Kenton, "Baby Bells," *Investopedia*, May 7, 2018, Accessed February 25, 2019, https://www.investopedia.com/terms/b/babybells.asp

7 Richard Barbrook and Andy Cameron, "The Californian Ideology," *Mute*, 1:3 "Code" (Autumn 1995), http://www.metamute.org/editorial/articles/californian-ideology, Accessed February 25, 2019.

8 Finn Brunton and Helen Nissenbaum, *Obsfuscation: A User's Guide for Privacy and Protest* (Cambridge, London: The MIT Press, 2015).

9 Eric Schmidt and Jared Cohen, *The New Digital Age: Reshaping the Future of People, Nations and Business* (New York: Alfred A. Knopf, 2013).

10 For instance, see Adrian Chen, "The Laborers Who Keep Dick Pics and Beheadings Out of Your Facebook Feed," *Wired*, October 23, 2014, Accessed February 25, 2019, https://www.wired.com/2014/10/content-moderation/, where Chen explores the role of cheap contractual labor in the moderation of Facebook content.

11 Lev Manovich. *The Language of New Media* (Cambridge, London: The MIT Press, 2001).

12 See https://disnovation.org/, Accessed February 26, 2019.

13 Matthew Fuller and Andrew Goffey, "Toward an Evil Media Studies," in *The Spam Book: On Viruses, Porn and Other Anomalies From the Dark Side of Digital Culture*, eds. Jussi Parikka and Tony D. Sampson (New Jersey: Hampton Press, 2009), 141-159.

14 The description of the group runs: "Media is not neutral. Behind the technical development of media lies the desire to influence and control, and more often than not, hidden practices of trickery, deception, and manipulation [...] The point is to look past widely discredited cases (propaganda, brainwashing, mind control) to consider more timely examples of media at the union of technical systems and social forces." See the Facebook page of the group: https://www.facebook.com/groups/344602542736754/, Accessed February 26, 2019.