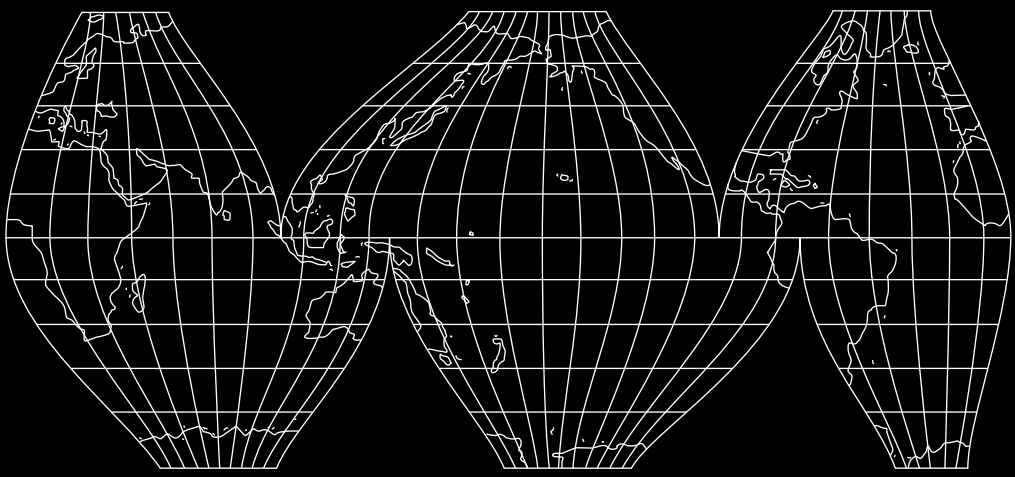
(HOW) CAN DATA IMAGES BE CRITICAL?



Birgit Schneider

Some ideas on the construction of people and unconventional graphs throughout the history of data graphics

Today, data images are omnipresent. Data journalists have been producing impressive, colorful graphics and maps for several years now. The “New York Times” and the “Guardian”, among many other newspapers, regularly produce full-page diagrams and maps that visualize topics as diverse as geopolitics, urban development, or the spread of disease. Moreover, data images are also ubiquitous in numerous research areas and in the area of politics. My chapter’s central question is: to what extent can data images and data maps themselves be critical and exceed their positivistic logic? Following Michel Foucault’s idea of critique, I see at least three different points of entry for criticism besides the possibility to criticize the charts themselves: either the data behind the graph is critical because it challenges power; or the procedure of data acquisition is a critical act because it challenges institutional forms of data collection; or, finally, the form and design of the data visualization

itself is critical by subverting graphical norms. I will unfold the argument by choosing historical diagrams that address groups of people through racial categories in very different ways. Examples are charts and graphs by Otto Neurath, from a German biology schoolbook from the Nazi period and by W.E.B. Du Bois to interrogate different entry points of critique. The overarching theme is the synopticism of data images in general and their calculative rationality, which statistical images and charts cannot leave behind. I will argue this by taking ideas from critical cartography, but also by moving beyond that discipline.

"TRUST IN NUMBERS"

Pointing to a graph of numbers has become the modern way to claim interpretive authority. Theodor Porter, a historian, referred to this relationship, which first became established in the 19th century, as "trust in numbers." Since then, mathematics and statistics – the discipline that concerns the collection, organization, analysis, interpretation, and presentation of data – rose not only as a source of new knowledge, but also as a strategy to claim scientific authority and objectivity. This led to "prestige and power of quantitative methods in the modern world" (Porter 1995: VII). Rigorous quantification has been sharpened into a method of super-personal objectivity, particularly in the justification of decisions made within a political and administrative environment that grants it a super-personal authority. Following this concept, we can say: many stats are *decision making tools* – statistics, data images, and data maps are among the most important tools of governance.

With the beginning of the Corona crisis everybody has been able to follow this on a daily basis. It was the reference to numbers and curves and the cry to "*Flatten the curve!*" that justified authoritative regulations and behavioral changes. At the same time, everyone got dizzy considering the numbers we stare at every day: Case numbers, R-values, growth rates, death rates with and from Corona, number of tests, positive tests, recovered and

currently ill people, or the 7-day incidence report. There have been repeated changes in terms of which figures have been communicated in the news over the months. Numbers were often communicated without comparisons or comparisons were given that were not actually comparable. In terms of ratios, there is also the question of what factors were and are being related: Country comparisons, R-values, and intensive care bed utilization, or corona and influenza infections? The effectiveness of politics depends on the "trust in numbers".

In a world with risks, societies have developed different ways to make risks controllable and governable. The sociologist of risk Ulrich Beck has emphasized the special value that representations have for correctly assessing risks, and in taking decisions: "For it is only through the representation, the enactment of the world risk that the future of the catastrophe becomes present – often with the aim of averting it by influencing present decisions" (2008: 30, translated by BS). Without such tools, policymakers would be blind to eventual futures.

After these general remarks about statistical maps and graphs and political power, I want to set out some thoughts about the critical potential of data visualizations. My thoughts have been initiated by increasing and fascinating publications in the field of what today is called *data journalism* and my post-structural reading of data visualizations, which has led to the insight that statistical rules and their graphical structures cannot ultimately escape positivistic methods and patterns.

"WHAT IS CRITIQUE?"

There are criteria for critical practice that allow for the erection of a distinction between critique and merely criticizing or badmouthing something. Moreover, one can ask who actually is or may be the voice of critique in societies.

In democracies, there are special professions that engage in criticism. The most prominent include journalists as the fourth force. It is they who have an essential control function against the powerful.

Quality standards for journalists apply equally to data journalists: the demand for free, independent, and critical reporting; these principles contain the inclusion of up-to-date or background information, explanation, classification, but also the ideal of accuracy in the sense of being true to the facts. This goes along with values such as completeness and transparency, but also first-hand information. The presentation of reports should be understandable; journalists have to master the art of simplification without distortion. For data journalists, the scientific quality criteria of cartography and statistics are added, which are accuracy of data and presentation, comparability and coherence, accessibility and clarity, timeliness, and expressiveness (Card 2003: 523).

So, what does the word critical mean in the term "critical reporting"? Michel Foucault gave a lecture to the French Society of Philosophy in 1978 entitled: *What is critique?* Here, Foucault emphasized criticism as a practice in the sense of a certain attitude, which he called "virtue", a moral and political attitude, referring to the epoch of enlightenment in the 18th century. *Sapere aude!* – dare to know! – was the motto of this attitude which credited every human being with the ability to leave immaturity behind: "A certain way of thinking, speaking and acting, a certain relationship to what exists, to what one knows, to what one does, a relationship to society, to culture and also a relationship to others that we could call, let's say, the critical attitude." (Foucault 1997: 24) ○ FIG.1

Moreover, criticism is always related to something, a circumstance, certain events or institutions, or even to a policy. This means that critique always has a vector and point of reference. Without this frame of reference, there is no critique. Critique is always an antagonist, a

counterpart to authorities; "critique only exists in relation to something other than itself: it is an instrument, a means for a future or a truth that it will not know nor happen to be, it oversees a domain it would want to police and is unable to regulate" (ibid: 25). Foucault's key question for the critical practice is, "how not to be governed like that, by that, in the name of those principles, with such and such an objective in mind and by means of such procedures, not like that, not for that, not by them" (ibid: 28). This statement is a call for a general questioning of official structures, their hierarchies, and their rules.

What we gain from my question about the critical potential of data graphics from the critical attitude and its determination by Foucault is the triangle of relations in which Foucault locates the critical attitude. We can use this with respect to the question of data images with the claim of criticism and elucidation, by stating that, "critique is the movement by which the subject gives himself [and herself, BS] the right to question truth on its effects of power and question power on its discourses of truth" (ibid: 32).

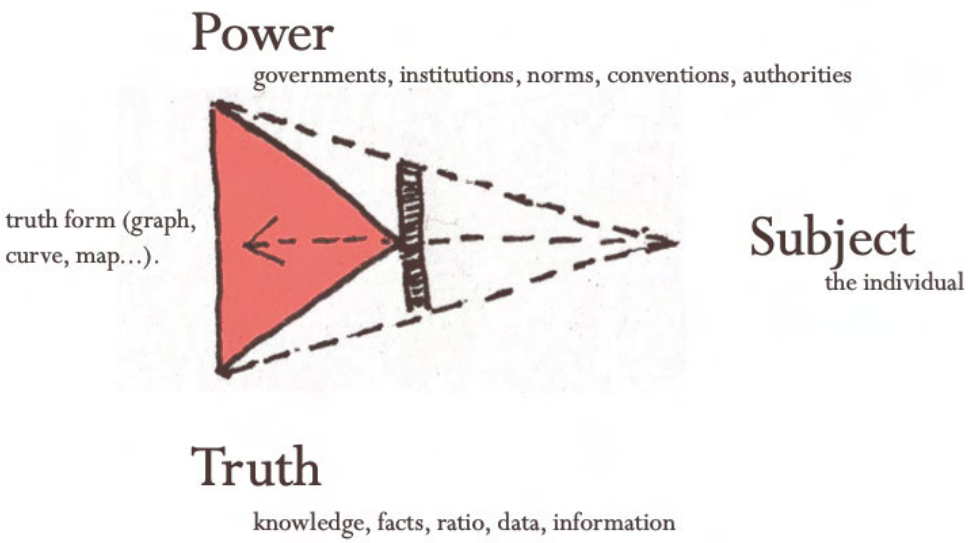
I want to summarize Judith Butler's take on Foucault's interpretation of critique where she related Foucault's idea of critique even more to aesthetic forms of truth in her talk that became published in 2002. Part of the critical enterprise, Butler writes, is a particular way of asking questions that will prove central to the accomplishment of critique (2002: 2). Giving a basis for normative judgments, normative claims, it is first necessary to ask about the values that prepare the action, and this will be an important dimension for any critical study of normative issues. Criticism is not useful for evaluating whether social conditions, etc., are good or bad, highly valued, or lowly valued; instead, criticism is intended to elaborate the system of evaluation itself. Butler poses the following questions, which I will quote in detail because they can be posed to graphs directly:

"What is the relation of knowledge to power such that our epistemological certainties turn out to support a way of structuring the world that forecloses alternative possibilities of ordering?" (ibid: 4). "To what extent, however, is that certainty orchestrated by forms of knowledge precisely in order to foreclose the possibility of thinking otherwise?" (ibid: 4). The following questions apply to the classifications chosen in statistics especially: "What counts as a person? What counts as a coherent gender? What qualifies as a citizen? Whose world is legitimated as real?" (ibid, 12). "Who can I become in such a world where the meanings and limits of the subject are set out in advance for me? By what norms am I constrained as I begin to ask what I may become? And what happens when I begin to become that for which there is no place within the given regime of truth?" (ibid: 12).

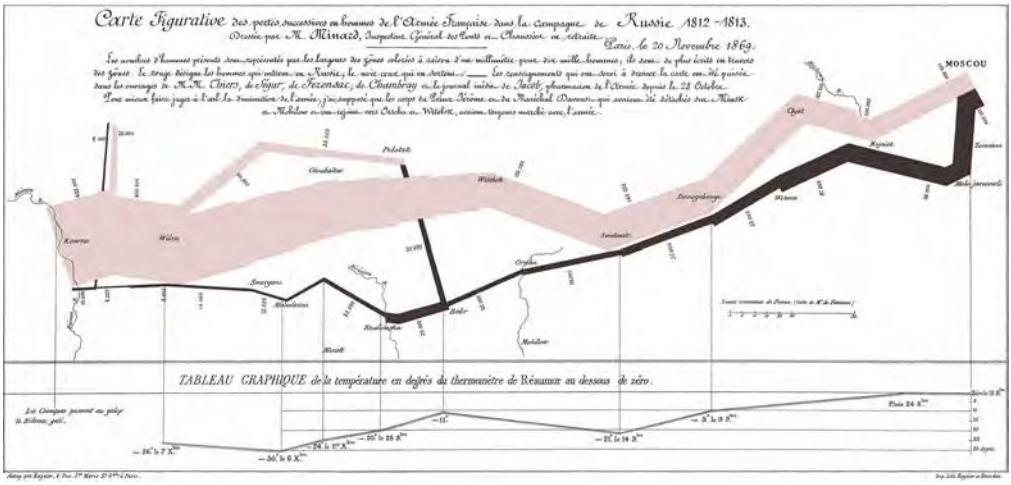
So, the general question is, which power relations limit a priori what is to be considered truth and what is not. I want to apply "the question of the limits of our most sure ways of knowing" (ibid: 5), as Butler wrote, to the 'iron language' and presentation of statistical data graphs and maps, because there are different media for criticism. But how can data maps and graphs become a medium of critique? Or can maps only be the object of criticism?

How do these two epistemic forms, the quest for critique, and the quest for data insight respectively, come together in contemporary investigative data journalism? I would like to illustrate this question with a well-known historical example. ○ We can ask: is the famous map of Napoleon's campaign against Russia by Charles Joseph Minard, which he created 57 years after the event, a critique of the meaningless sacrifices of war? If so, where exactly does this criticism originate? Was it in the collection of the data (Minard wasn't a whistle blower, instead he applied official data that had already been published), in the choice and framing of the topic, in the procedures of how this

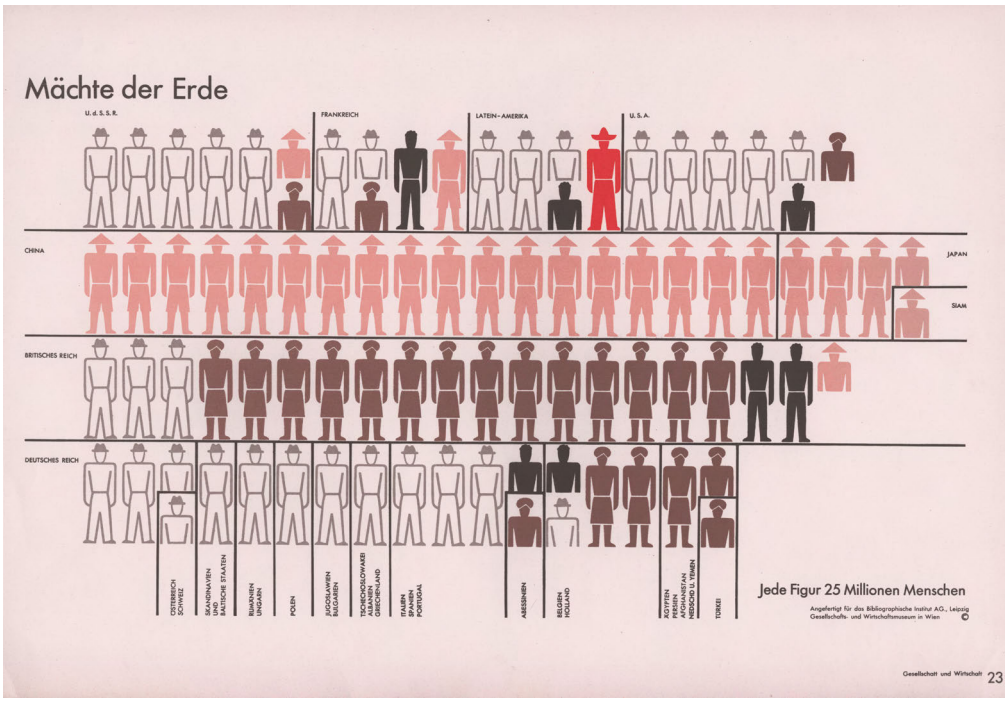
FIG.2



● FIG.1 ▶ "Triangle of critique: a relation of the individual towards power and truth." Graphic: Birgit Schneider.



● FIG.2 ▶ "The art of not being so governed"? Charles Joseph Minard's map of Napoleon's campaign against Russia in 1812, 1869.



● FIG.3 ▶ Powers of the World. Standardization of people by linocut symbols and limited colors in Otto Neurath: Gesellschaft und Wirtschaft. Bildstatistisches Elementarwerk [Society and Economy. Elemental Pictorial-statistical Opus], 1930.

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knowledge is prepared as a statistical data map, or in the unconventional visual presentation form itself, for which the map has become famous? We could ask similar questions for the equally famous charts by William Playfair (Sieber 2022) or of Florence Nightingale's rose diagrams. I see different points of entry for criticism stemming from Michel Foucault's idea of critique and its reading by Judith Butler. These assign to data visualization either the role of an (passive) object of critique (1) or, on the contrary, the role of a critical subject and agent (2-4):

1. We can criticize individual examples of statistical visualizations;
2. The data behind the graph can be critical because the authors publish data that has not been shared publicly and, therefore, it challenges truth and power;
3. A data visualization can be critical because it informs people about a truth that is neglected or has been forgotten about in the current discourse;
4. Finally, the data visualization's form and design can be critical by subverting graphical norms.

In the following section, I will use historical examples to elaborate these different entry points for critique for data visualizations.

WE CAN CRITICIZE INDIVIDUAL EXAMPLES OF STATISTICAL VISUALIZATIONS

Otto Neurath (1882-1945) pursued an objective and scientific ideal in the production and communication of statistics. Charts should communicate facts in a comprehensive and expressive way and enable informed decisions. Furthermore, he was particularly concerned that popular statistics should educate each individual, especially the less privileged workers, about their own situation so that they could advocate for improvements based on this knowledge.

"I found out that most people are like me – they want to acquire a general knowledge of their environment both in their own country and abroad, but it is only as laymen and not as experts that they wish to do this. Experts can tell us of their results but they cannot make decisions for us, since they are swayed by their own desires and individual outlook. Therefore, whenever the fate of individuals and communities is at stake we need some comprehensive knowledge to help us make our own decisions. It is for this that I think visual aids are so important, especially when we wish to educate ourselves and others in citizenship." (Neurath 2010: 7).

The ideal of the informed citizen was the aim of his pictorial language. In a very general manner, we can criticize every data visualization for not being expressive or correct enough, not meeting the standards of accuracy, just as we can do with singular graphs that depict the corona pandemic, in order to call out for better, more accurate images for example. But there are also other aspects of charts to which criticism can apply. From today's perspective, some of Otto Neurath's statistical graphics can be criticized for their unquestioned clichés of racist symbolic figures, as in the case of the figurative bar chart illustration "Mächte der Welt" (Powers of the World) from the joint work by Neurath and Gerd Arnz "Gesellschaft und Wirtschaft. Bildstatistisches Elementarwerk" (Society and Economy. Elemental Pictorial-statistical Opus) which was published in 1930. ○ The stylistic decision to reduce all charts to eight colors and to symbolize categories with the simplest possible attributes and icons led to the fact that the societies of the world became seen from a perspective of colonial European history. Moreover, they were all translated into male, human-shaped symbols with only five colors to depict the skin colors of ethnic groups (white, brown, yellow, black, and red) and five different types of traditional outfits and headwear (Asian conical hats, Hom-

FIG. 3

burg hat, turban, sombrero). Only the black figures are shown with a bare head and hair structure. In this, the authors staged racial and hierarchical stereotypes and stigmatized people even though their primary intention, as I assume, was not to denigrate through caricatures. However, this was the result of the ideal to be comprehensive by means of pictorial symbolism and in order to avoid abstraction. Would a completely abstract graphic, consisting only of numbers and lines, have erased the racist layer of representation and through their joint efforts simply have dispelled the accusation of racism? Is it true that there are no ideology-free images?

I would like to relate this question, how form and content are mixed in the case of charts and graphs, to a far more problematic example than Neurath's stereotypes of ethnic groups, which comes from the Nazi period and its racist and eugenic construction of "Volk" (a people). It applies the power of objective science, persuasion through facts, classification, and comprehensive overview to the racial doctrine itself in the same graphically elegant and modern style for which Otto Neurath had become so famous. Neurath was a member of the Vienna Circle and was a Marxist. My question is, what changes when visual displays of quantitative or causal information like bar charts, maps, or flowcharts communicate obviously racist contents in a similar form and style? Here I am interested in criticizing the abuse of educational graphics employed in the name of a racist and totalitarian ideology.

Racist and eugenic propaganda was an omnipresent theme in the NSDAP's time. The propagandists aimed at making demands on policy on the basis of biology and racial doctrine ("Erblehre"). We can observe the significant effort to make racial doctrine and law-making common knowledge by using enlightening infographics as a motor to change the minds, morals, and education of the people with the aim of

producing the "higher ideal" of a pure German so-called "Volkskörper". When the NSDAP came to power, they implemented their doctrines into everyday life very quickly and wherever possible. This also included the school curriculum and education which became monopolized and homogenized, because it appeared promising to the power holders to influence people when they were still young and shapable. This is what one of the campaign's planners wrote:

"Through racial hygienic thinking (including population science in the narrow sense), strong impulses can be awakened in the pupils which contribute to the formation of true German citizens. There is hardly any other area of biology teaching which is so strongly emotional as this, and it would be a gross pedagogical sin of omission if we did not exploit such a value." (cited after Cromm 2004: 304, translated by BS).

Population awareness should be thought of as a population problem by evoking fears of decline, which could only be conquered by "racial hygiene". So, the racial doctrine was systematically integrated into school media and textbook knowledge during the years 1933-1945. The subject that was supposed to teach these connections was natural science. By shifting doctrines to biology, racist thinking became framed as biological thinking and it became formulated like natural law. Historian Jürgen Cromm, in an article on the subject of Nazi-education, wrote that: "The authors present their evidence and conclusions and policy measures as a logical consequence of scientific facts, translated into language appropriate to the age and level of education, from simple, pictorial and illustrated to scientific language" (Cromm 2004: 314, translated by BS). The implementation into society must have been very successful, if we think about the claims of NSU and right-wing values in Germany today. During the National Socialist Underground trial 2013-2018, one member's defense revolved around wanting to invite a demographer to the court to prove the idea of the German people's decline ("Volkstod"). This

demonstrates the lasting effect of this racist construction of "a people" to this day.

For the infographics presented here, we might ask what categorization – race, class, and gender – are the guiding principles for structuring the data for the purposes of teaching biology in a German secondary school during the Nazi government. ○ The graphic design of the numbers is cold, modern, and factual. They represent a reworking of an earlier publication by Alfred Vogel (Vogel 1938). ○ I assume that the original author of the graphs, Alfred Vogel, was aware of the new statistical approach taken by Marxist Otto Neurath, and his ideas for popular education through information pictures, and Vogel just applied this approach to educating the masses in racist Nazi values in a cruel and pseudo-scientific logic. ○ The neutral, aesthetically pleasing, and objective design of tables, bar charts, and flowcharts are used to educate German pupils about the need for German citizens to bring as many healthy children into the world as they can and informs them about who to reproduce with.

FIG.4

FIG.5A

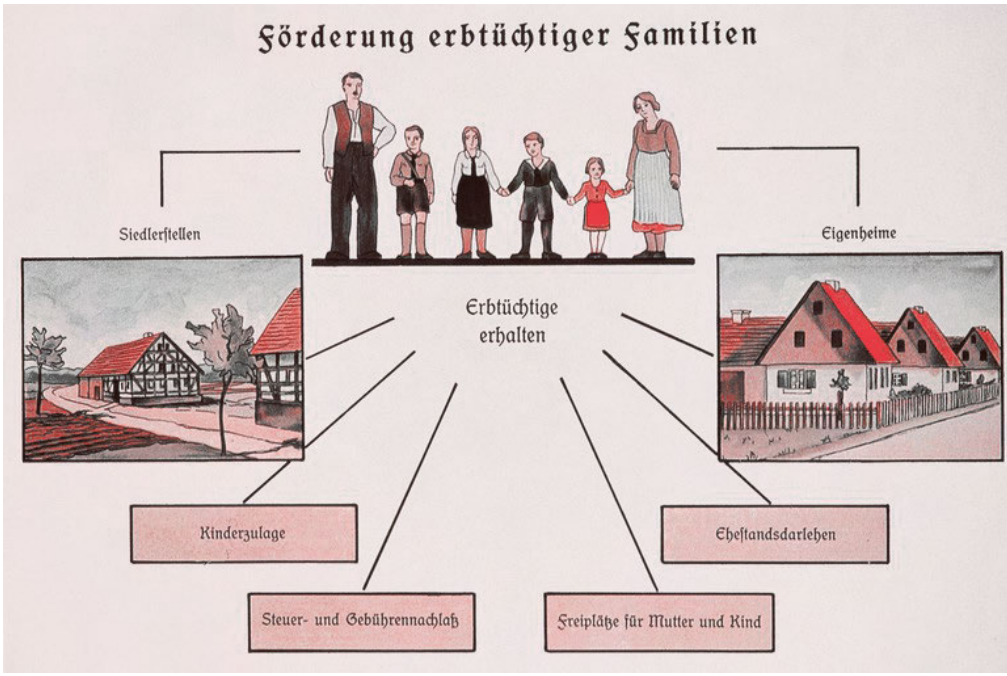
FIG.5B

Some graphics combine the neutral design of bar charts or reproduction diagrams with caricature-like cliches of "the Jew" or figuratively stylized icons of the highly reproductive German family – living in a traditional house in the countryside. A father of four kids is holding a spade like a farmer to plant his seed into his ground; his wife is wearing a traditional dress with the obligatory apron. Here we can of course very easily criticize the normative cliché of the German family and the degrading picture of the Jew. However, I would argue that such statistics would be problematic even if they had refrained from using racist or normative and misogynist icons, although such figures emphasize the racist dimension of the charts even more explicitly.

We can learn from such an example that even though the content changes drastically, the aesthetic does not have to. Such examples of discriminating and normative social statistic discuss race doctrines in terms of natural

sciences. They use the rational logic of chart design to construct their notion of a people. By publishing the charts in a biology textbook, they are framed as truth to reason and rationality.

This allows us to discuss the ideology behind seemingly neutral charts and data images. The critical take here would be similar to the widespread view about the use of tools as weapons: A knife in itself may be a neutral tool, but using it to kill or hurt someone transforms the tool into a dangerous weapon. Is a graph a neutral tool? This would mean that a graphical form, like a bar chart, can be seen as being like a museum that can be filled with different content, like an empty and neutral structure. As a consequence, we need to criticize the content only, but not the form or package of its delivery. We could compare a graphical form to language in a similar way. The alphabet, words, and syntax can be seen to be the medium to transport very different ideologies. Language is neutral to content, albeit only up to a certain point. Then again, certain terms are bound to contexts and histories of exploitation, injustice, and discrimination; therefore, they are not neutral at all. There is no truth claim without context, this is why it is so important to situate knowledge. At the same time, statistics are a language with a quasi-natural truth claim resting on rationality. If we could not read the words, which of the graphs mentioned would still be racist? In their neutral design, they can blend out ideological and moral framings and instead deliver them as quasi-natural laws.



● FIG.4 ▶ Alfred Vogel: Erblehre und Rassenkunde in bildlicher Darstellung [Genetics and racial science in pictorial representation], 1938.

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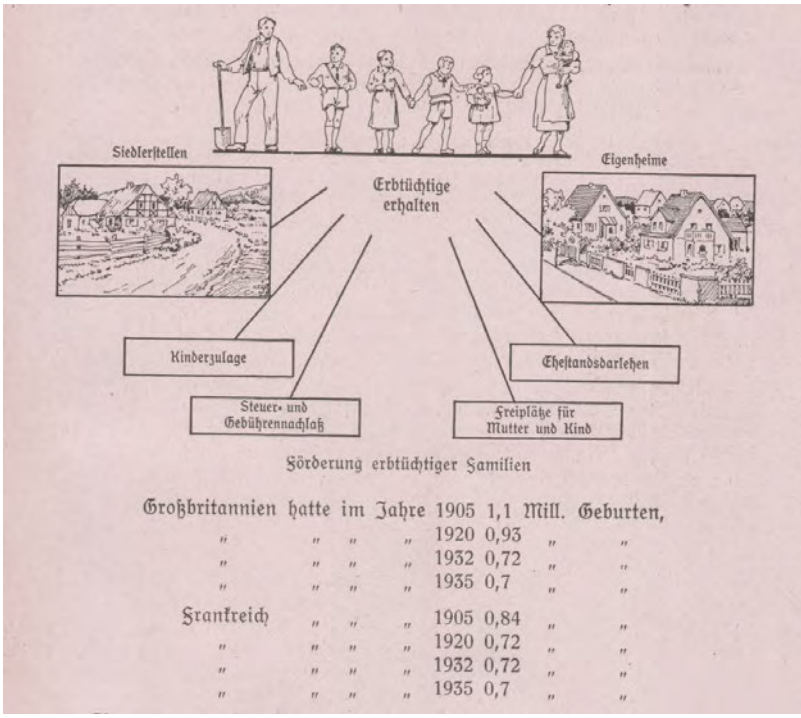
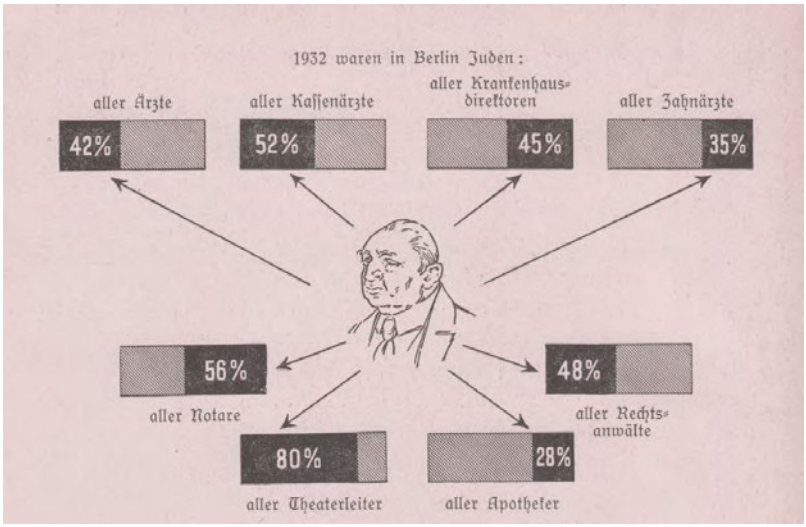




● FIG.5A/B ▶ Charts of racial doctrine for German biology classes after Alfred Vogel [fig. 4]. Meyer-Zimmermann: Lebenskunde, Bd. 3, Lehrbuch der Biologie für höhere Schulen [Textbook of biology for secondary schools] Erfurt 1942, 3. Aufl.

CRITICAL PRACTICE OF CHART DESIGN

I have chosen the following example to discuss the other forms of criticism mentioned, which anchor criticism in the data design practice itself (2, 3, and 4). Data acquisition can be a critical, counter-cultural act because it challenges institutional forms of data collection and authority knowledge by telling stories with numbers. This is the *sapere aude!* part of statistics.

Famous examples were once again initiated by Otto Neurath, who believed that informing the working class about their own status quo would empower them to change their situation, but we can also return to the invention of Florence Nightingale's rose diagrams from the 19th century, which she used to convince rulers to improve the hygienic standards in hospitals (Brasseur 2005). The ideal of data collection here goes hand in hand with the belief that you need to know about the context, and you need to analyze the problem in order to ground political claims. As a consequence, people require comprehensible maps and graphics that support their knowledge and communicate it evidently and clearly to a diverse public.

To problematize these positive ideas about the usefulness of data designs, I would like to turn to the graphics of a Black professor of sociology at Atlanta University some decades before Otto Neurath published his Isotype ideal (Battle-Baptiste/Rusert 2018). William Edward Burghardt "W. E. B." Du Bois (1886-1963) was a sociologist and author from Massachusetts, who later became an activist and a Pan-Africanist. He had studied at Fisk University, Kaiser-Wilhelm-University in Berlin (now Humboldt University), and Harvard at which he was the first African American to earn a doctorate. In 1897, he became a professor of history, sociology, and economics at Atlanta University. Two years later he published his first major academic work entitled "The Philadelphia Negro[1]" (1899), a detailed and comprehensive economic

01 "Negro" was the term used by Du Bois. It will appear in this paper only when quoting his work.

and sociological study of the African-American inhabitants of Philadelphia.[2]

Du Bois used statistical design in the three critical ways. He collected new data (2) and by this informed about their life but also made visible the high share of Black inhabitants to economy and U.S. progress (3). Du Bois and his team overcame the fact that Black persons were not even included in the statistics until then, or if they were, they were listed according to criteria that he considered unrepresentative. The chart's aesthetic was uncommon and pioneeringly protomodernist (4).

Rhetorician Lynda Olman has written that Du Bois actually "decolonized the infographics" (Olman, in press). His aim was the "reformation of white viewers' thinking around Blackness and race, and uplift of Black viewers' self-conception" (ibid). Du Bois' motivation to make these graphics was to educate and inform by offering factual information nearly three decades after the Emancipation Proclamation: "The Negro problem was in my mind a matter of systematic investigation and intelligent understanding. The world was thinking wrong about race, because it did not know. The ultimate evil was stupidity. The cure for it was knowledge based on scientific investigation." (Du Bois cited after ibid) In the following paragraphs, I will intensively draw from Olman's analysis and on the publication of the charts by Whitney Battle-Baptiste and Britt Rusert.

Du Bois had a very limited budget, both in terms of time and money, for the process of data collection. Within less than half a year, his student team had brought together existing census data, but also supplemented the data with specially conducted surveys in Georgia (Battle-Baptiste/Rusert 2018: 17). The graphics were divided into two larger and a smaller intermediary section: "The Georgia Negro: A Social Study", "A Series of Statistical Charts

02 It showcased Black progress in ten different categories: history; education; literacy; occupations; property; publications; patents; industry; cultural organizations; and race relations in the U.S.

Illustrating the Condition of the Descendants of Former African Slaves Now Resident in the United States of America", and "Income and Expenditure of 150 Negro Families in Atlanta, GA, USA." The graphics were produced for the 1900 World's fair in Paris, where they were exhibited in a special section entitled "The Exhibit of American Negroes". They were shown together with several series of photographs depicting African Americans, their institutions, and patents within the U.S section in the Palace of Social Economy, in the style of a modern multimedia cabinet. The exhibition toured through different U.S. cities afterwards.

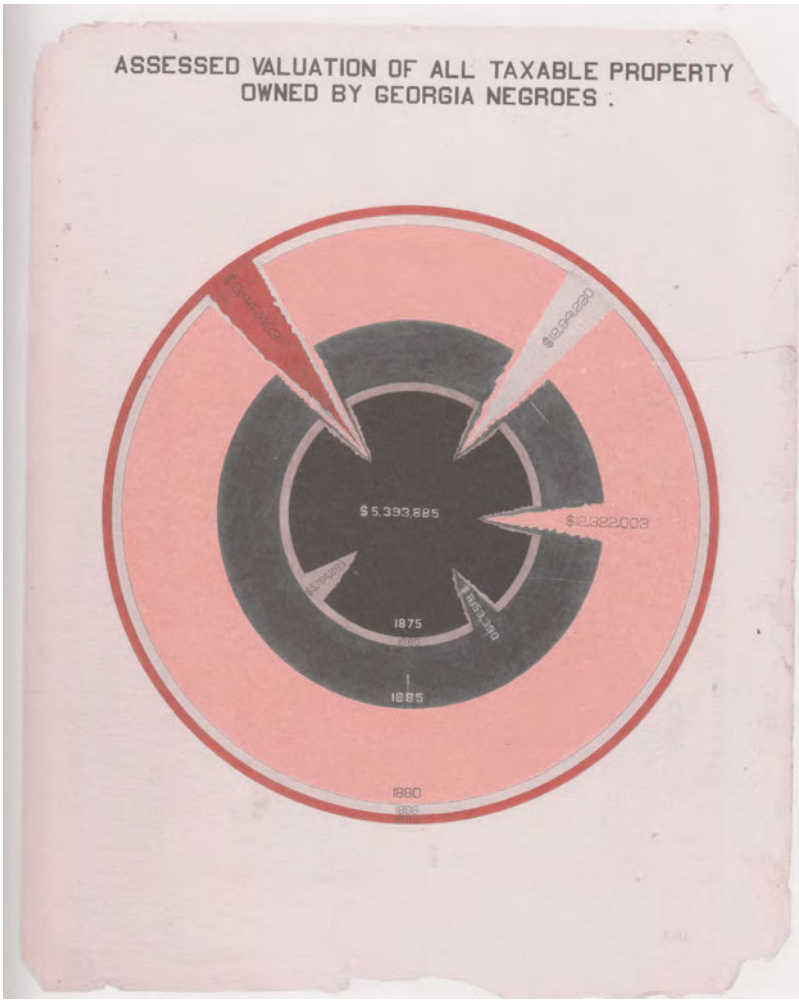
Du Bois' data graphics stand out for both their content and their unusual protomodern aesthetic, which may have been additionally increased by the purpose of the exhibition. The graphics and maps were hand-drawn in ink and watercolor. One of the most uncommon figures is a colorful spiral "where he folds the parallel lines of the bar graph into a continuous zig-zag and spiraling path that frustrates the process of visual comparison while amplifying the aesthetic aspects of the graph as well as a sense of disorientation", as Olman writes (ibid). Many of the graphs only reveal their structural meaning at a second glance, but they draw attention to their significant form immediately.

His strongest influence at the levels of content, style, and color was Francis A. Walker's 1870 "Statistical Atlas of the United States" (ibid). However, although this was the most comprehensive volume on the subject of social statistics, there was only a little that could be learned about the specific life of Black Americans, except about general shares in the population of the various States. Another model for the design of Du Bois' charts might have been Charles Whittingham's popular illustrated version of "The first six books of elements by Euclid" (1847) which made extensive use of the primary color palette of yellow, red, blue, and black for geometric laws of form, long before De Stijl. ○○

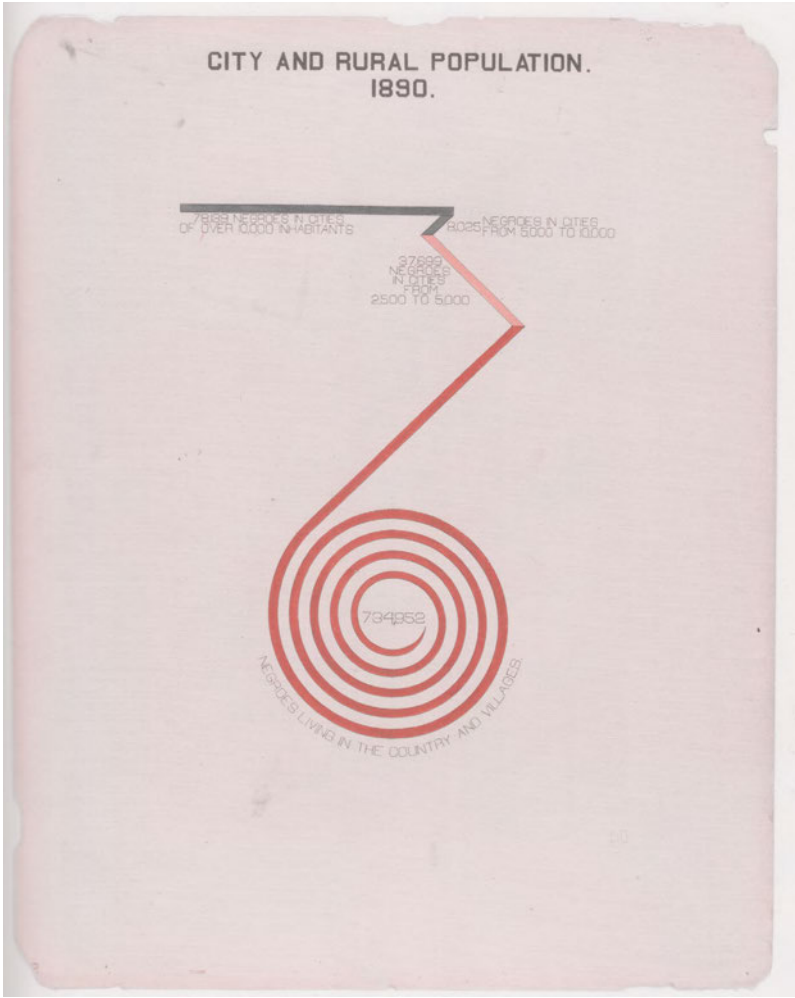
FIG.6,7

I will not go into the history any further at this point, but will instead discuss the example in relation to my central question. We could conclude that Du Bois successfully applied data graphics in a critical way. Both the production and publication of the charts was an act of protest. He staged the marginalized who had been neglected by the powerful, he collected new data, and he reconfigured data for new questions; he even presented his findings in an uncommon design. So, we can assume the project was "a powerful counter-argument, stating that blacks had always been a part of world history and that 'black spirit' was evident in the range of culture on view – from literature and poetry to patents and other works of independent black genius", as Whitney Battle-Baptiste and Britt Rusert wrote in their re-editing of the series in 2018 (Battle-Baptiste/Rusert 2018: 43). However, even after the very well-received exhibition Du Bois came to the insight that, "one could not be a calm, cool, and detached scientist while Negroes were lynched, murdered and starved." (Du Bois cited after Olman) Du Bois considered his project to be a failure, because the scientific language was not adequate either to the subject or to his political objective. There was no time to inform about the conditions if the rulers did not want to listen, but maybe it was also not about making Black people visible within seemingly neutral abstract graphs, while obviously concrete Black people were being killed; there was also another, more subliminal reason for the failure within the graphic method itself which likewise had to do with ruling hegemony and which resides in the objectifying Cartesian tradition of what Max Weber termed "occidental rationalism" or Eze more recently named "calculative rationality" (Eze 2008: 25). Olman highlights the panopticism of the charts:

"Infographics are tough to decolonize, however, because their very *raison d'être* is panopticism – i.e., presenting a complex situation or problem as a simpler one that can be comprehended "at a glance" (Barton & Barton, 1993).



● FIG.6 ▶ Increasing quantities in the shape of colored rings. W.E.B. Du Bois: Data graphic for "The Exhibit of American Negroes", Paris 1900. Assessed valuation of all taxable property owned by Georgia Negroes.



● FIG.7 ▶ Spiral-formed wound-up bar chart by W.E.B. Du Bois: Data graphic for "The Exhibit of American Negroes", Paris 1900. City and rural population 1890.

And, panopticism as a rule reinforces the dominant political hegemony because to make a complex, messy situation "clear," panopticism must reduce that situation, and the hegemony is the one whose "grid of intelligibility" (Foucault 1973; 1990) determines what matters and what doesn't, what is ruled out and ruled in, what is foregrounded and what is backgrounded." (Olman, in press)

Du Bois "entered a field of competition dominated by social-Darwinist and white-supremacist justifications […]" (ibid) by affirming the language of social statistics and synoptic data graphs and maps and by exhibiting at the 1900 World fair, which took place in the Western supremacist mindset of colonialism, industrialization, progress, and objective science. By delivering data about a marginalized and discriminated group of people, Du Bois' charts might even play into the wrong hands because, in line with Foucault, "panopticism – their at-a-glance reduction of complex issues – makes them tend to support hegemonic power structures in spite of their designers' intentions" (ibid).[3] Voicing criticism in the language of data graphics is bound to the framework of the factual and of the objectifying epistemology of Cartesian science. However, the author's status of power also changes the power of critique.[4] For such results are and remain part of the paradigm of an instrumental reason's feasibility. The expressiveness of the lines based on numbers is sober and cool, representing the

03 "An early and important effort in this turn, Barton and Barton (Barton/Barton, 1993) applied Foucault's theory of panopticism to argue that while infographics exhibit both modes of panopticism—the synoptic (generalization, overview) and the analytic (individualization, analysis)—infographics that are dominantly synoptic tend to support the hegemonic power of the technocrats who made and distributed the infographics, and to disempower lay viewers from feeling they have any agency to change the situation being depicted." (Olman, in press).

04 Du Bois might have had a professorship, but he had to cross the Atlantic in steerage (Battle-Baptiste/Rusert 2018: 17).

ideal of the disciplined morality of objectivity developed in the 19th century. The rationalization took place in the mode of an objectivity that was authenticated and manufactured by machines or quantified procedures, a supra-moral, disciplined, and standardized form of knowledge that proceeds in a precise, cool, and measuring way. Consequently, they correspond to the ideal that historians of science Lorraine Daston and Peter Galison accurately described in the historical emergence in the 19th century as mechanical objectivity for different media and fields of knowledge (Daston/Galison 2007).

Thus, what Foucault understood by critique, namely "the art of not being so governed" (i.e., of not being so disciplined by methodological constraints), can be understood as a way of thinking and questioning that opposes all attempts to formalize methods. According to critical theory, such manufactured facts cannot be givens, because the numbers of statistics are socially fabricated. From them, even the injustice of social dominance can be deciphered.

MAKING DATA GRAPHICS OTHERWISE?

Nevertheless, Olman insists that Du Bois' graphical project did not fail because he was "embracing heterological strategies of technical visualization", since "he also innovated within the dominant visual topology mentioned above – framed by *topoi of comparison, part/whole, degree, space, and time* – to subvert viewers' expectations around Blackness, racialization, and socio-economic progress" (Olman, in press).

Barbara Orland and David Gugerli wrote in 2002 that, "[e]ntirely normal pictures do not require any justification. Everyone sees or knows them - no one reacts or wonders. If everyone thinks they see and understand the same thing, then that is reality. […] Because

● FIG.8 ▶ Making data graphics otherwise? Reformatting of atlases by Simryn Gill: Four Atlases Of The World And One Of Stars, 2009, paper, glue.

completely normal pictures gain their self-evidence by the fact that they correspond in their form to the expectations of their users and are made available in the given context of action" (Gugerli/Orland 2002: 9). William Playfair's financial curves, Minard's Napoleon's Russian campaign, Nightingale's Rose Diagram, Du Bois' chart designs, they are all famous for displaying data differently, unconventionally, and by confronting viewers' expectations and raising their awareness. This is an aim that must be achieved if one claims to do infographics otherwise. Here a path is laid out by Arturo Escobar in his book "Designs for the Pluriverse", in which he asks if "design's modernist tradition [can] be reoriented from its dependence on the life-stifling dualist ontology of patriarchal capitalist modernity toward relational modes of knowing, being, and doing" (Escobar 2018: XI).

Still, all of the graphics discussed throughout this chapter have not escaped the positivist paradigm of data graphics. This is something that is very hard to achieve from within the system, why only artists might be able to interrogate, lever out, undermine, or completely destroy the logic of infographics and, in so doing, make visible their a priori claim to envision facts about the world super-historically and without emotion. ○ FIG.8

So, do critical truth modes of data graphics have to fulfill all levels of critique, that is, be critical of the data, critical of the visual methods, and critical in the choice of subject? Can graphical methods, such as data visualizations, be used critically as counterarguments or forms of protest? Can these forms be critical themselves if the perspective of critical research nevertheless resists the 'iron language' of mathematical procedures? Is it even possible to work in the humanities without the positivist bias of formalizing methods? Or do all findings based on measuring, counting, or digital methods remain forever linked to the history of mechanical objectivity and the

positivism of these methods and their "calculative rationality"? This needs further discussions that take not only who gets visible on a map into account, but which are also mindful of who is allowed to draw a chart at all. Here the triangle of critique comes into play again as a relation of the individual towards power and truth. This triangle needs to be extended to a quadrangle, a pentagon, or a polygon by applying the field of political ecology, including the relations among culture, power, politics, and nature.

→VIDEO LINK

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