

RESEARCH ARTICLE

True to form: Media and data technologies of self-inscription

Christine von Oertzen

Max Planck Institute for the History of Science, Berlin
Email: coertzen@mpiwg-berlin.mpg.de

Argument

This paper examines self-inscription, a mode of census enumeration that emerged during the nineteenth century. Starting in the 1840s, a number of European states introduced self-inscription as an auxiliary means to facilitate the work of enumerators. However, a decisive shift occurred when Prussian census statisticians implemented self-inscription via individual “Zählkarten”—or “counting cards”—in 1871. The paper argues that scientific ideals of accuracy and precision prevalent in the sciences at the time motivated Prussian census officials to initiate self-inscription as an at-home scenario unmediated by enumerators, in which the census form alone was to yield truthful information from the respondents. By illuminating the bureaucratic means for implementing scientific ideals and practices in gathering personal census data, the paper offers an in-depth analysis of the media, technologies, and manpower that census takers deployed to reveal the epistemic—as well as social and political—impact of being “true to form.”

Keywords: history of population statistics; bureaucratic knowledge; material history of knowledge; nineteenth century; history of data and experiment; census enumeration

This paper explores the methods, tools, and practices of gathering personal information in nineteenth-century census taking. This is an endeavor we generally assume to be performed by enumerators who go from door to door and note down the required information in lists they carry along with them. Especially in the United States, where the decennial taking of the census was a constitutional mandate, doorstep interrogations were often depicted in this fashion (see [figure 1](#)). Many of these illustrations show the enumerator seated in close proximity to an open front door, holding a heavy volume of a bound enumeration list in his lap and waiting attentively for an answer that he can put down. Whether surrounded by members of a large rural household or keeping a polite distance from a well-off middle-class family having dinner, the enumerator is portrayed as an expert entrusted with extracting answers from the respondents: it is he who is in charge of making sense of what is being said, in order to subsume information *viva voce* under the appropriate rubrics of the enumeration list.

Nineteenth-century scenarios of census taking like those described here were carefully thought-through encounters, choreographed in a period that witnessed a new, innovative reflexivity toward cumulative, quantifying methods across science, commerce, and the state.¹ Buttressed by national and transnational efforts to establish standardized rules and processes for census enumeration, the retrieval of information garnered acute attention. The doorstep encounter was considered to

¹The history of quantification—most prominently explored by Porter 1985 and 1995, Krüger et. al. 1987, Hacking 1990, Schweber 2006, and Desrosières 2007—has recently garnered renewed interest within the framework of data history. For an overview, see Gitelman 2014; Aronova et. al. 2017; de Chadarevian and Porter 2018.



Figure 1. The Census – An Enumerator Collecting Data in the German District on the East Side, New York City. Drawing by Miss G.A. Davis, engraved by H.W. Peckwell. Title page of Frank Leslie's Illustrated Newspaper, June 14, 1890 (detail). Courtesy Library of Congress.

be one of the most critical moments of any census effort, as correct, complete, and commensurable data were the precondition for producing meaningful tables that would stand up to public scrutiny. Consequently, questions regarding how best to master the challenges of gathering truthful personal information on a mass scale were widely discussed within expert circles (Porter 2003, 2011). Entrusting enumerators with asking questions and noting down the answers in bound lists remained the most common method within census taking during this time period, and it was especially preferred for complex surveys like those in the United States, or in nations with low rates of literacy such as Russia (Kaufmann 1913, 208). But statisticians across Central and Western Europe probed various means of census taking, which involved respondents directly in the act of inscription.

Starting in the 1840s, self-inscription was introduced in Belgium and Great Britain, followed by Saxony in 1858 and Italy in 1861, while both the method itself and the paper forms required for its implementation became widely debated issues. Initially, self-inscription was used mainly as an auxiliary means to facilitate the work of enumerators or save the cost of paying them. The latter was especially true for the British variant of self-inscription, where preliminary lists were handed to heads of households so that paid enumerators would save the time and effort of recording the information themselves. Enumerators collected these preliminary lists once they were filled in and transcribed all entries to a clean copy, which was then processed further (Brückweh 2015, 93, 100). All systems of self-inscription put in place before 1867, including the one in Prussia, were conducted in a similar way (Knapp 1867, 3).

A decisive shift occurred when Prussian census statisticians moved away from collecting census information in enumeration lists and implemented self-inscription by way of individual “Zählkarten,” or “counting cards,” in 1871. This overhaul of established procedures was the result

of a decade-long, step-by-step process of reform, advanced by officials of the Prussian Statistical Bureau. Self-inscription was experimentally introduced in a few big cities such as Berlin and Frankfurt in 1861, then gradually expanded in the subsequent counts of 1864 and 1867 and eventually made mandatory as part of Prussia's ambitious 1871 census reform (Schneider 2013, 236; Horstmann 2020, 220; Engel 1867, 267).

Historians have elucidated the institutional and transnational contexts in which self-inscription emerged (Schneider 2013; Brückweh 2015; Horstmann 2020). These accounts offer insights into how the new method gained momentum, but they do not fully explore the epistemic dimensions behind this dynamic. Clearly, considerations across ministries and local authorities as to whether or not moving forward with the Statistical Bureau's initiative predominantly addressed issues of cost efficiency and bureaucratic work flow optimization (Schneider 2013, 226; Horstmann 2020, 217–227). Census officials were pressured to contain expenses, especially given that the census was carried out at five-year intervals, or even more frequently. They, in turn, used fiscal and procedural arguments as strategies to push for the new procedure. At the same time, however, they were also motivated to do so by a desire to align census methods with scientific ideals.

This paper offers an in-depth analysis of the scientific agenda behind self-inscription by exploring the reasons that Prussian census statisticians favored the novel method—besides and beyond fiscal concerns. Taking census officials at their word that the accuracy of the results and not cost efficiency should enjoy the highest priority when deciding on the best way of gathering data for population statistics (Neumann 1864, 12),² I explore the reasons why Prussian census officials did everything they could to make counting cards work without any intervention by enumerators. They were convinced that the unmediated encounter between the census form and those it was meant to enumerate was a necessary first step in a seamless, yet strictly controlled process of data gathering and compilation geared towards meaningful quantitative aggregates displayed in tables and other spatial representations (von Oertzen 2018b).

By explaining in detail why self-inscription via counting cards enjoyed such high esteem among Prussian statisticians and how this stance affected those enumerated and shaped the census effort as a whole, this paper explores the intricacies of data epistemologies in nineteenth-century census taking. Recent scholarship on the history of data in anthropology, biomedicine, genetics, and the social sciences has emphasized that individuality, intimacy, and personal ownership form a crucial part of data histories that critically reflect material cultures, epistemic shifts, and political economies of cumulative, quantifying methods (Bouk 2017; Lemov 2015; Porter 2018; Radin 2017). Building on this historiography, this essay seeks to further enrich our historical understanding of personal data in the making within a bureaucratic framework and its epistemic practices (see Felten and von Oertzen 2020).

Prussian officials sought to establish a highly controlled environment in which people's homes would function as spaces that enabled a "spontaneous" retrieval of truthful personal information for the census. This scenario was regarded as necessary to obtain data from which reliable statistical aggregates could be drawn. I claim that by implementing self-inscription, together with other new methods and forms for census enumeration, Prussian census statisticians made a radical move to substantiate population statistics through ideals of objectivity that were prevalent in the exact sciences of the time. My aim is to show how these ideals were expressed in the census statisticians' theorizing and how they were implemented in practice.

These methodological and procedural considerations fundamentally changed the way in which primary material, or what officials called "self-inscribed *Ur*-data," was produced at the doorstep. By zooming in on officials' deliberations along with the immense logistical efforts that they made to implement scenarios for collecting such data, I will reveal both the conceptual framework and

²"Indess kann der Kostenspieligkeit nur eine relative Bedeutung zuerkannt werden; vielmehr liegt bei der Frage von der Zählungsausführung ... der Schwerpunkt der Entscheidung darin, ob ... der Zweck der Zählung, d.h. die nach ihrem sachlichen Gehalt wie nach ihrer numerischen Richtigkeit besten Resultate erreicht werde."

the actual legwork that went into engineering it. I argue that the quest for truthful personal data was closely related to ideals of objectivity, and I will unfold the bureaucratic means that Prussian officials employed in establishing a fixed record of truthful information that would meet scientific standards of accuracy. Hence, this paper considers the epistemic promises and challenges that census statisticians saw in self-inscription, the procedures by which the method was to be implemented, and the impact it had for those counted and the census effort as a whole. I will address these questions in four steps, by closely analyzing the media, technologies, and manpower put in place to enable the principle of being “true to form.”

Medium of immediacy: The Prussian counting card

At the core of Prussia’s fundamental reconfiguration of the census survey in 1871 was a new paper form, the Prussian counting card (*Zählkarte*, see [figure 2](#)). Printed on heavy-duty paper and cut to a handy size, the counting cards differed from enumeration lists used in most other nations’ census efforts in two significant ways. First, the counting card contained all questions to be answered by each person on a single, standalone page. The new paper tool represented a radical departure from customary enumeration lists, such as the ones used for the American census. These were bound lists that provided a fixed grid in which individual particulars were recorded line by line (See [figure 3](#)). By contrast, the Prussian counting card, once filled in, represented a complete, movable data set representing one individual (see [figure 2](#)).

This property of the counting card accounted for a second major deviation from established enumeration procedures. Prussian counting cards served to gather the required information at people’s homes, but they were then also used to sort, count, and compile the particulars inscribed on them, so that the processing of the data into numbers and statistical aggregates was accomplished without any further transfer of the original information inscribed on each card. Prussian census officials hailed these multipurpose features of their mobile cards as superior to any other method, as no tedious and error-prone transfers of the collected information onto intermediary carriers were required before the data could be compiled.³ The Prussian paper tool made it possible to compile the data that had been gathered without such fickle, time-consuming, and expensive transcriptions. For this reason, Berlin’s statisticians lauded the counting card as the foundation for producing quantitative depictions of the populace based on aggregates in a way that was not only the fastest and cheapest, but also the most reliable (Engel 1870, 40).

In their zeal to create the most accurate population statistics that had ever been achieved, Prussian census officials insisted it was key to implement a seamless process, with as little human interference as possible, that would prevent errors from creeping in and distorting the data. This imperative applied in particular to the point of data entry in each home, which posed the biggest hazard of the whole endeavor. To safeguard the harvest of unbiased information, Prussian statisticians envisioned a specific scenario, in which the heads of household would perform the act of responding to the questions by interacting directly with the forms. This did not mean that enumerators were no longer needed, but they were pushed from the center to the sidelines of inscription, where they acquired a new role as enablers, controllers, and authenticators rather than as actors in the entry of data. They were expected to deliver and then later collect the enumeration material from each household.

Usually, the census took place in the early days of December, when things were slowing down and people could be expected to be at home. The counting letters were delivered to each household one or two days before they were to be collected, so that the forms would not stay out of official reach for too long. Ideally, the pick-up was scheduled after a Sunday, because “usually then all

³Ernst Engel to the Prussian Minister of the Interior, 18 June 1871, *Kostenanschlag für die Volkszählung von 1871*, GStA PK, HA I, Rep. 77, Tit. 94, no. 132, vol. 1, 36.

A. Volkszählung am 1. December 1871. 202 ...

Herzogthum Rauenburg.

Ort, Gemeinde

Straße oder Platz Haus Nr.

Zählbezirk Nr. Zählbrief Nr. Zählkarte Nr.

Man wolle vor Beantwortung der gestellten Fragen die Anleitung D. vergleichen.

1. Vor- und Familiennamen:
2. Geschlecht:
3. Geburtsort:
 Kreis: Staat:
4. Geburtstag und Geburtsjahr:
5. Familienstand:
6. Religionsbekenntniß:
7. Stand, Rang, Beruf, Erwerbszweig; Arbeits- oder Dienstverhältniß.
 Hauptbeschäftigung:
 Etwaige, mit Erwerb verbundene Nebenbeschäftigung:
8. Staatsangehörigkeit (Name des Staats):
9. Wohnort (der Personen, die für gewöhnlich nicht an der Haushaltung theilnehmen):
 Kreis: Staat:
10. Schulbildung, d. h. kann lesen und schreiben?
11. Besondere, die Bildungs- oder Erwerbsfähigkeit beeinträchtigende Mängel:
 blind? taubstumm? blödsinnig? irrsinnig?

Figure 2. Prussian counting card (21 x 12 cm) used for the census of 1871. The card represents a moveable data set of one individual. GStA PK, HA I, Rep. 77, Tit. 94, no. 132, vol. 1, 202.

errors, and to complete omissions. This act of verification, reinforced through a second proof run by the local authorities, turned each card into an authenticated official record carrying precious *Ur*-data.

The procedure followed long-established bureaucratic practices of authentication (Vismann, 2011, Stollberg-Rillinger and Krischer, 2010). However, in the context of the carefully thought-out setting in which personal data was to be acquired for the 1871 census, the meaning of official testimony became epistemically relevant in new ways. People's hand-written data entries were verified not unlike inscriptions in scientific experimentation in the laboratories of the day, where a strictly controlled process, secured by technical means, testimonies, and error calculations, became the safeguard for generating accurate data (Rheinberger 2011; Latour 1987; Fischer et al., 2021).

Self-inscription implied a major shift in bureaucratic communication: blank forms had mostly been used for internal administrative purposes, or consigned to agents of state power, such as enumerators.⁴ The new questionnaires therefore marked a turning point in that the form became a medium of direct contact between the state and its subjects in their own homes. The card itself was purposefully designed to serve this function. Its header asked for locality, street address, and three numbers to identify each card—metadata that were often filled in by the enumerator before delivery, as it was necessary to verify each individual data set and situate each card within the overall mass of the census material (von Oertzen 2019, 112–114). The actual points of interest for the census as such were condensed in no more than eleven questions in the card's main body, asking for name, date and place of birth, sex, civil and employment status, relationship to the head of household, and literacy, as well as mental and physical disabilities affecting the capacity to learn and earn a living. These questions established each individual's data record.

Some of the criteria were considered statistical staples, whereas others varied from count to count and were included after much dispute to address particularly pressing political or social concerns (see also Ledebur 2023, this volume). However, the questions were deliberately few, and compressed for utmost clarity—or so statisticians believed—so that even the simplest mind could understand and answer them concisely. There were no boxes to tick. Except for the last question, which asked for one of four options to be circled, answers had to be written down in words on dotted lines, forcing respondents to inscribe the cards in their own hand. This way, each household's cards carried a very personal trace, binding the “data doubles” to their creators like a signature (Bouk 2017).⁵

Self-inscription via handwriting caused a plethora of problems in later stages of the compiling effort, as many respondents were not used to filling in forms. Few of the original cards have survived, but if critics of the Prussian method are to be believed, cards were returned with millions of ambiguous entries in different colloquial terms, and in handwriting that was often quite clumsy, frequently spilling over into the space allotted to other answers and thus cluttering the cards' surface (Mayr 1914, 122). And as these very cards were subsequently used to classify, sort, and re-sort all criteria inscribed on them in numerous rounds of counting, the deciphering of the self-entries remained a constant challenge throughout the entire compilation process. Self-inscription by way of counting cards turned the manual aggregation and tabulation of the data into a head-spinning undertaking involving a trusted workforce of hundreds of experienced housewives toiling in their homes (von Oertzen 2019). Nevertheless, notwithstanding the high price they had

⁴Peter Becker argues that until the mid-twentieth century, forms were exclusively used to rationalize internal administrative processes. Only after 1945 does he see forms enter every household, for example to regulate entitlement for social security, etc. (see Becker 2009, 291). However, it seems that self-inscription for the census predates this important shift in administrative communication by almost 100 years.

⁵Handwriting was taught in schools at the time as a skill for developing a characteristic deviation from the norm, so that writing in one's own hand would have an individual imprint, as well as help to impede forgery, for example in the case of notes of hand or securities. See Götting 1913–1917, 4, 638; Bosse 2012, 101.

to pay, Prussian census officials defended their approach, emphasizing that the act of writing enhanced the circumspection and sincerity of respondents, while also leading to fewer errors than ticking boxes or circling words.⁶ Hence the layout of the counting cards' interface changed little over the next decades, and occasional alterations to "please cross out what does not apply" ("Nicht-zutreffendes ist auszustreichen") were sometimes reversed for the next count.⁷ And once established, the Prussian system of manual data processing remained in place for more than forty years.

Ideals of objectivity

The main goals that Prussian statisticians sought to achieve with self-inscription via counting cards were to gather trustworthy and complete sets of *Ur*-data to start with, and to keep this *Ur*-data free from errors throughout the compilation process. Inherent in the Prussian statisticians' concept of self-inscription was the promise that the "givens," once carefully selected and gathered in a single action, would make it possible to unlock patterns in the social fabric otherwise unfathomable to the human eye. Their belief that the best way to achieve this insight would be self-inscription rested on their confidence in the counting card's potential as a medium of veracity. Prussian statisticians saw the card as a paper tool that afforded a spontaneous and yet assiduous self-interrogation in the intimate space of people's own homes. From the start, self-inscription had been related to ideas of sovereign popular participation, which should be introduced "firstly because of the spontaneity that should be left to the citizens," to quote from the French summary of a debate at the First International Statistical Congress in Brussels in 1853.⁸ During this meeting, proponents of the method had insisted that voluntary participation alone would be conscientious and yield the desired results, and therefore statisticians must fully embrace this approach (Neumann, 1864, 13).

In their pursuit of the untainted immediacy that they expected to be enabled by the new form and the environment set up around it, Prussian statisticians also echoed longstanding claims that their field of expertise was a science in its own right (von Oertzen 2018; Sepkoski 2018). By insisting that these data were best gathered through self-inscription, statisticians implied ideals of mechanical objectivity as a virtue of scientific practice—an ideal that had pervaded all the empirical sciences by the middle of the nineteenth century (Daston and Galison 2007, 196.) Especially in the experimental laboratories, self-registering instruments such as photography and self-eliminating technologies such as instruments that traced the curves of muscle action, which replaced the practices of drawing by hand or using trained judgment, became imperative to scientific objectivity, while human interference was increasingly denounced as "subjective" and prone to error (Daston and Galison 2007, 197).

Photography in particular was hailed, especially in the observational sciences, as yielding representations of natural phenomena untainted by human interference. Just one among many such voices, embryologist Wilhelm His praised photography as a method that "reproduces the

⁶See Emil Blenck, Zusammenstellung und Begutachtung der Erfahrungen, Bedenken und Abänderungsvorschläge, welche die Königlichen Regierungspräsidenten und der Magistrat zu Berlin in ihren Berichten über die Ausführung der Volkszählung vom 2. Dezember 1895 niedergelegt haben, GStA PK, HA I, Rep. 77, Tit. 94, no. 159, vol. 2, 37.

⁷This observation was based on the year-long experience that other agencies from the railway to the registry office had made with claimants filling in blanks on site; see Protokoll der 3. Sitzung der Konferenz von Vorständen deutscher statistischer Zentralstellen am 9. Oktober 1879 [= Anhang B des Protokolls der Bundesratssitzung no. 96, 12. Mai 1879], GStA PK, HA I, Rep. 77, Tit. 94, no. 148, vol. 1, 313v.

⁸See Neumann 1864, 13: "d'abord à cause de la spontanéité qu'il convient de laisser aux citoyens." Opponents of this method did not share this belief in voluntariness, claiming that, on the contrary, enumerators should surprise people to prevent them from having the time to reflect on the consequences that their answers may have and prepare false statements (*ibid.*).

object with all its particularities, including those that are accidental, in a certain sense as raw material, but which guarantees absolute fidelity” to the object in question (His 1880, 6). Leading statisticians such as cameralist Wilhelm Butte and August von Schlözer, professor for history and politics at the University of Göttingen, had been among the first in German lands to refer to photography when they described the methods of quantification and data gathering and the promise these held for accuracy. They bolstered their claims with recourse to notions of data as a category of the “here and now,” which permitted statisticians to produce precise snapshots of the state of things, frozen in time.⁹ Speaking of self-inscription, Georg von Mayr, head of the Bavarian Statistical Bureau and author of several path-breaking publications on statistical theory, described the gathering of enumeration data as a “fixation of particulars in the enumeration document,” which in his view “virtually represents a photographic record of all elements of observation” (Mayr 1914, 92).¹⁰ He regarded this photographic representation of particulars fixed in the enumeration form as a resource (*Rohstoff*), which statisticians then turned into knowledge about the masses through compilation and analysis (Mayr 1914, 107).

Ernst Engel, director of the Prussian Statistical Bureau and initiator of the 1871 reform, compared the importance of counting cards to the introduction of experiments in the social sciences. He argued that the cards embodied the characteristics of living individuals and thus made those accessible to the methods used in the study of nature (Engel 1870, 38).¹¹ In another instance, he described population statistics as an observational science devoted to the social realm and best described as a “terrestrial observatory,” providing a bird’s-eye view of social phenomena otherwise unfathomable to human perception. Engel likened the novel methods of gathering population data to the lens of this terrestrial observatory, “which provides the same level of accuracy as the telescopes used by astronomers, or as instruments deployed in chemical laboratories” (Engel 1861b, 53).

With reference to Adolphe Quetelet, astronomer and statistician of the Belgian census, Engel defined statistics as “the physics of society” (“Physik der Gesellschaft”), tasked with first observing phenomena of “the physiological, mental, political, and social life of peoples within the nation-states they live in,” and then with “analyzing the connections between cause and effect of these phenomena” (Engel 1861a, 53).¹² Mayr, for his part, reasoned that population statistics was a social science devoted to the “physiognomy of the populace” (“Physiognomie der Bevölkerung”) (Mayr, 1877, 32). In keeping with these analogies to the social sciences, physics, physiognomy,

⁹Rüdiger Campe states that von Schlözer provided the basis for a theory of quantification in which semantic description and probabilistic calculation merged into a modern concept of statistics. This theory was based on the explicit use of the notion of “data” as a strictly relational category, first brought to use in the context of the colonization of the huge Polish territory brought under Prussian rule between 1772 and 1795. See Campe 2003, 79–82. For the use of the notion of “data” prior to the nineteenth century, see Rosenberg 2018. On bureaucratic rule in the Polish territories, see Olesko 2020.

¹⁰“Die wesentliche Voraussetzung der richtigen Festlegung des Beobachtungsergebnisses ist, dass die Einzelheiten der Feststellung also die einzelnen Aussagen über das Beobachtungsobjekt, in der Urkunde in individuell erkennbarer Weise niedergelegt werden in der Art, dass das Ergebnis jeder einzelnen Aussage in seinen besonderen Beziehungen zum Objekt genau erkennbar bleibt. Die Festlegung soll nur die für die weitere statistische Ausbeutung bereitgelegte, gewissermaßen photographische Wiedergabe aller einzelnen Beobachtungselemente enthalten.”

¹¹“Wäre hier der Ort einer theoretischen Darlegung der in der Statistik anwendbaren Methoden, so würden wir den wichtigsten Fortschritt der Auszählung [durch Zählkarten, C.O.] . . . in das hellste Licht setzen müssen. An dieser Stelle müssen wir uns auf die Andeutung beschränken, dass er sich am besten mit der Einführung des Experiments in den moralischen und politischen Wissenschaften vergleichen lässt. Das das lebende Individuum mit seinen Eigenschaften ist gewissermaßen in dem kleinen unscheinbaren Zählblättchen verkörpert und in Folge dessen allen Methoden der Naturforschung zugänglich geworden. Was das heißen will, werden all diejenigen zu würdigen wissen, welche mit jenen Methoden vertraut sind.”

¹²Quetelet, for his part, drew much of his insight on periodic phenomena in astronomy and meteorology from his work with the birth entries of the Brussels city registry, where he discovered connections between the progressions of seasons and human procreation. See Donnelly 2017, 61.

photography, and the telescope, one can conclude that Engel regarded each entry inscribed on a counting card as a fixed data point whose meaning could be unraveled in relation to other data points brought into statistical vision at the same moment, just like stars in the firmament observed with an unerring telescope during a cold winter night.¹³

In a treatise on statistics and the principles of social life published in 1877 as part of a popular series on the laws of nature, Mayr conceded that mass observation of social phenomena such as birth or mortality rates would never achieve “absolute truth,” but rather yield “a very high degree of probability bordering on certainty” (Mayr 1877, 38). However, he saw this not as a weakness of population statistics, but rather as a strength shared with the exact sciences, which were also never immune to error (Mayr, 1877: 38; see also Ledebur 2023, this issue). In fact, it became common practice to openly discuss the pros and cons of method, practical problems, and issues of margins of error in census offices’ publications, as evidence that population statistics was part of a broader scientific culture.

It was in this spirit of scientificity that statisticians took pride in a public discourse on how to continuously optimize the methods of census taking, while at the same time calling on the population to support the census effort in their own interest. For if statistical mass observation was to match the standard of accuracy achieved in the natural sciences, Prussian officials expected the *Ur*-data gathered in people’s homes to be both as correct and as complete as had ever been possible. As a factor integral to their scientific reasoning, these officials envisioned public participation as a crucial precondition for all particulars to be provided in unreserved pureness. For this reason, they strove to engage the populace in what they perceived to be the collective project of the young nation’s self-depiction, not unlike an all-encompassing citizen science project.

For Engel, trustworthy data could only be gathered successfully if the public was committed to the project in such a way that people willingly and assiduously shared the necessary information to their best knowledge (“die willige und gewissenhafte Mitwirkung des Volkes,” Engel 1875, 42). Census taking, he thus argued, should be announced as an “act of highest national interest” and not just as a usual matter of local policing. Ideally, a census law would provide such a framework, appealing to honor and honesty. In the same vein, he thought, it had to be made crystal clear that the census was to exclusively serve the common good and should only be used to establish general knowledge about the current state of the populace (“Volkszustand”), rather than being inflated by inquiries serving more comprehensive objectives, as they saw in the American census (see also Anderson 1990). Building on a small number of basic questions comprehensible to every ordinary head of household, the aim was to produce numerical aggregates that made it possible to reveal the most crucial universal trends and patterns in order to better understand the social fabric of the young nation. This and nothing else should be of concern to the census, or as Engel wrote: the numerical data “consist of nothing more than knowing of the state of the nation.”¹⁴ Engel considered the state’s self-restraint as a *sine-qua-non* to keep the questions few and simple and to build the necessary trust, emphasizing time and again that the census—in contrast to past experience—was a truly collective, bottom-up undertaking without strings attached.

Considering how enumeration efforts had been conducted in the past, the director did not expect this trust to build overnight, as most people still associated state counts with tax increases, military drafts, and other “incommodious consequences” (“individuell lästige Konsequenzen,” Engel 1875, 42). Rather, he envisioned the census effort via self-inscription as part of a long-term

¹³As Simon Schaffer has shown, astronomers established strict protocols and chronometric regimes to standardize and mechanize observation in and across observatories by establishing a strict division of labor and vigilant surveillance of subordinate observers. See Schaffer 1988.

¹⁴“Dieselben sind in der Erkenntnis des Volkszustandes erschöpft”; see Engel 1875, 42.

exercise in nation-building and educational patriotism, which would call upon the civic virtues and duties of every man heading a household. This highly gendered appeal obviously took into account that all adult male citizens over twenty-five years of age had recently been granted the right to vote irrespective of their social rank.¹⁵ Embracing both nationalist and participatory civic appeals in order to achieve scientific accuracy, Engel urged all authorities involved in the census effort to “not miss any opportunity to dispel mistrust and fear of the census among the people” (Engel 1875, 42).¹⁶ Additionally, local authorities were to emphasize that their role in certifying each individual’s data set went no further than ensuring that the information given on each card was complete and correct. In all provinces, officials involved in the process were to be held accountable for guaranteeing that individual census data were not used in any way other than for census enumeration, claiming that misuse of the data would be forcefully condemned (*ibid.*). Thus, in order to establish the census as a scientific enterprise, Engel appealed to the collective spirit that he saw in the endeavor, urging that the gathering of the data should be entrusted to self-governing agencies on the local level. Census commissions were to be run on a voluntary basis, as were the labors of the many enumerators, whose new assignment was to not interfere in the act of inscription as such, but to prudently shepherd ten to thirty households through the process of delivering the required *Ur*-data (*ibid.*, 44).

Operating the terrestrial telescope

For all the effort that went into designing the counting card as a simple, stand-alone paper tool, it did not function self-sufficiently. What actually ended up at people’s doorsteps was an envelope called a “counting letter” (*Zählbrief*, see [figure 4](#)). This letter contained a whole set of other card-sized forms, in addition to counting cards for each member of the household, which were all necessary to make the census work: a household list for everyone present at the time of the count; a list for everyone absent; fine-print instructions on how to answer each of the eleven questions on the counting card; and an example card with answers printed in the blanks in cursive to help the recipients understand what was required.

The envelope kept all of these loose forms together, while also serving as the enumerator’s deputy in reminding the heads of households of the procedure to be followed after the paperwork had been handed over at the doorstep and the counting letter had crossed the threshold into domestic spaces where compliance could not be directly enforced. A printed greeting from the local census commission in the address field combined a politely phrased request to fill in the enclosed forms punctually, truthfully, and in due form (“pünktlich, wahrheitsgetreu und vorschriftsmäßig”). Indeed, many of the high hopes invested in data obtained by self-inscription culminated in the expectation that those filling it out would be “true to form.” The imprint also offered the enumerator’s help upon his return to retrieve the material, should the recipients prefer to have him complete the entries. The wording “will be picked up” (“Wird wieder abgeholt”), printed in bold in the envelope’s upper right corner, referred to this moment, obscuring the fact that this face-to-face encounter would entail a thorough checking of each entry as a crucial first step of official certification, no matter if help was desired or not.

The sets of forms sent to each household provide evidence that in practice, self-inscription was neither self-evident nor instantaneous. Heads of household were asked to invest a fair amount of time and cognitive labor to make sense of all the paperwork and execute what was expected from

¹⁵The right to vote for all male citizens over twenty-five years of age was granted in 1867, three years prior to the founding of Imperial Germany in 1871.

¹⁶“Je weniger die Bevölkerung im Allgemeinen diese Aufgabe noch begreift, und so lange dieselbe aus der Volkszählung Steuererhöhungen und ähnliche individuell lästige Konsequenzen fürchtet – wird keine Maßnahme zu versäumen sein, welche geeignet ist, das Misstrauen und die Furcht des Volkes zu beseitigen.”

Zählbrief Nr. _____ Wird wieder abgeholt.

Volkszählung am 1. December 1871.

An den Haushaltungsvorstand

Herrn _____

in Hause Nr. _____ Strasse, Platz _____ Zählbezirk Nr. _____

Inliegend:

3 Zählkarten A. _____ Ort, Gemeinde _____ Kreis _____
 1 Merkzettel für Anwesende B.
 1 Liste für Abwesende C.
 1 Anleitung zur Ausfüllung D.

Zur bestmöglichen Erreichung des wichtigen Zweckes der diesjährigen Volkszählung wird vertrauensvoll Ihre Mitwirkung in sofern in Anspruch genommen, als Sie hierdurch erjudt werden, die inliegenden Zählkarten zc. pünktlich, wahrheitsgetreu und vorchriftsmäßig auszufüllen. Sollten Sie die Ausfüllung durch den von uns bestellten Zähler vorziehen, so wollen Sie demselben die dazu erforderlichen Angaben bei Wiederabholung dieses Zählbriefs und seiner Einlagen am 1. December d. J. machen.

Die Orts-Zählungscommission.

115
1871
16/12/1871

Figure 4. Printed interface of the counting letter (*Zählbrief*), Prussian census 1871. GStA PK, HA I, Rep. 77, Tit. 94, no. 132, vol. 1, 115.

them. The material exposes the complexity of the experimental set-up for the Prussians' terrestrial telescope to determine all data points accurately.

Census officials in Berlin were well aware of these challenges. To accommodate the needs of the new method, responsibilities and resources on the ground had been fundamentally reallocated within the grand scheme of the census reform. Traditionally, counting districts had been in charge of managing their part of the count more or less independently from the Statistical Bureau in Berlin, from printing their own enumeration lists to compiling interim results, which were then added up in Berlin. The 1871 census reform brought an end to this kind of decentralized jumble by strictly centralizing control of every aspect connected to the census effort in Berlin, except for the fieldwork of gathering the data. All paper forms needed for the census effort were produced by the printing press of a major newspaper; envelopes came from one other trusted business, selected by the Statistical Bureau in Berlin after a rigorous bidding process.¹⁷ Counting districts received these materials in customized and labeled census boxes dispatched to their localities, with meticulous instructions regarding the order in which to pack them for their return to Berlin, once the *Ur*-data and lists in all counting letters had been checked and certified, so that the content of each box would mirror the social and geographical context of the data harvest, household by household, house by house, street by street, etc. (von Oertzen 2020). Upon return of the boxes, the manual processing of the data that had been gathered was then entirely done in Berlin.

Centralizing the production of forms and the compiling effort entirely in Berlin did not mean that local authorities were reduced to redundant players. Rather, the new method created new hierarchies and a division of responsibilities that had great impact on how the gathering of the data unfolded in practice. No longer involved in the costly business of

¹⁷Engel to Geheimer Regierungsrat Bitter, 5 June 1871, GStA, HA I, Rep. 77, Tit. 94 Nr. 132 Bd. 1, Bl. 31 r and v. See also Schmidt-Bachem 2011, 27–40.

producing forms and the laborious compiling of interim tables, authorities on the ground were now all the more expected “to do everything they can to assure success of the new method.”¹⁸

This instruction left the legwork required to make self-inscription work much to the discretion of local officials and the census commissions set up for gathering the data. The Statistical Bureau issued some general guidelines. Local authorities were to spare no effort and take the utmost care while preparing, executing, and completing the enumeration process via self-inscription. This in-depth engagement included “using pertinent measures to inform and familiarize the public with what the new method entails.”¹⁹

As a first step towards this goal, local officials were tasked with diligently studying instructions and forms sent to them prior to the census, flagging obscurities back to the Statistical Bureau in Berlin. Once fully acquainted with the procedure, it was their responsibility to explain the new procedure to the residents in their districts. This could be done by printing exemplars of the census forms in the local newspapers or by posting them on announcement boards or advertising pillars, by elucidating the why and how of the method in short invocations, or by giving notice of the upcoming enumeration procedure at parish assemblies and local council meetings.

Another crucial responsibility on their part was to nominate local census commissions and enumerators, preferably “men of public spirit who are really interested in the new procedure” (*ibid.*). These men should, firstly, be capable of fully grasping the overall purpose of the endeavor, its need for participatory momentum, and how to fill in the forms. Additionally, they were also expected to be affable and willing to pass on their knowledge to any head of household—regardless of their social background—in engaging ways, to answer all questions patiently, and to offer help to fill in the forms if desired.

Though all of the aforementioned measures were meant to build trust in order to promote people’s willingness to act on behalf of their civic capacities, it was also the enumerators’ responsibility to exert control as official certifiers. This duty included identifying and registering every household in their assigned area before the count, as well as certifying every entry on each card upon retrieval (Kaufmann 1913, 205). This arrangement was necessary from an epistemological point of view. Only if all households were included, and all entries on each card were checked right on the spot, could the data claim to be complete and correct. The Statistical Bureau insisted that individual *Ur*-data linked to real people were only of interest to statisticians insofar as they guaranteed the correctness of all particulars that were needed for compiling accurate statistics.²⁰ What counted for them were the tables and aggregates that were published after each count in mighty tomes. In these, as Engel emphasized, “the specimen or individual is no longer visible” (Engel 1861, 163). The *Ur*-data were only a means to this end, and (almost) all counting cards were discarded as “dead data” as soon as compilation was completed.²¹

¹⁸Prussian Ministries for the Interior and for Finances to all Oberpräsidenten of the Monarchy, 8 September 1871, Denkschrift zur Neuen Volkszählung (Memorandum concerning the New Census), GStA PK, HA I, Rep. 77, Tit. 94 no. 132 vol. 1, 137–139v, here: 138 “Die zeitraubenden und kostspieligen Tabellen, welche bei Gelegenheit früherer Zählungen von den Behörden gefordert worden sind, fallen damit fort. Umso mehr darf aber auch die bestimmte Erwartung gehegt werden, dass es sich sämtliche, mit der Ausführung der Zählung betraute Organe angelegen sein lassen werden, dem neuen Verfahren den Erfolg zu sichern, und ihrerseits die sorgfältigste und eingehenste Tätigkeit vor, während und nach der Zählung zur Erreichung dieses Ziels zu entwickeln.”

¹⁹Prussian Ministries for the Interior and for Finances to all Oberpräsidenten of the Monarchy, 8 September 1871, Denkschrift zur Neuen Volkszählung (Memorandum concerning the New Census), GStA PK, HA I, Rep. 77, Tit. 94, no. 132, vol. 1, 137–139v.

²⁰See Mayr 1877, 111: “Wenn auch Vor- und Familiennamen selbst einer statistischen Ausbeutung nicht unterworfen werden, so ist doch deren Angabe zur vollen Inventaraufnahme unerlässlich.” English: “Even though first and surnames are not included in the statistical compilation, it is indispensable to record them for the sake of a complete inventory.”

²¹Engel to the Ministry of the Interior, 29 November 1872, GStA PK, HA I, Rep. 77, Tit. 94, no. 132, vol. 1, 227–39. The only exception was counting cards containing information about mentally or physically disabled individuals. Those cards were forwarded to the department of medical statistics for further use. See Kühnert to Ministry of the Interior, 3 May 1910, GStA PK, I HA, Rep. 77, Tit. 536, no. 30, vol. 2, n.p.; see also Schneider 2013, 264–5; and Ledebur 2023, this issue.

However, the division of labor that made officials and enumerators on the ground responsible to ensure that the gathered data were complete and correct created a new dynamic, as people and local authorities valued the chains to their “data doubles” in rather opposite ways.

Data frictions—Data yields

In view of how important standardization and strictness of procedure were in all other areas of the census, it seems remarkable that local authorities were not given clearer orders on how to master their fieldwork tasks. In line with the concept’s bottom-up, participatory approach, instructions from Berlin explicitly left it to the in situ judgement of urban, municipal, and rural districts to apply whatever they deemed most appropriate in order to prepare and motivate people to willingly inscribe their data.²² Consequently, local authorities’ commitment to implement self-inscription varied greatly.

Some districts exceeded expectations with their creativity in activating resources for the project. In the city of Cologne, high school teachers enlisted as enumerators brought the forms to class a few days prior to counting day to show their students how to help fill in the forms at home. This strategy was used as an exemplar in later counts and discussed as a general instruction for teachers of students over ten years of age, to improve blank form literacy across all localities.²³

More often, though, local officials deviated from how the system was intended to work. Some encouraged enumerators to fill the blanks on the basis of the information they had available in their registers because they did not expect heads of household to be able to self-inscribe. In other, mostly rural districts, heads of household were summoned to barns where they underwent group instruction followed by communal fill-the-form sessions, which spared enumerators the time and effort of rattling off instructions at each door. In working class areas, as well as those with large Danish, Polish, or French minorities, census revisors were supported by local police and bailiffs, who sifted through local registers, tax files, electoral lists, and any other records to get the entries right.²⁴ Still others succumbed to the temptation of sharing the data hoard with third parties.

When Engel learned that the state of Thüringen had created lists on the basis of the 1875 counting cards, with information on all the physically and mentally ill, and forwarded these to local physician associations to enable further examination, he compassionately condemned this measure as a misuse of census data. In his view, professional organizations should run their own surveys instead of tapping into the state’s data trove, which was not created to serve their special interests. The incident led him to assert that the question be dropped as a mandatory request for the German national census of 1880, claiming that the overall number of handicapped people was too low to justify its inclusion.²⁵ This did not mean, however, that he himself abstained from keeping the question on the Prussian Statistical Bureau’s 1880 counting card (Ledebur 2023, this issue). This move suggests that Engel had nothing against collecting information on physical and mental disabilities, as long as he had control over how the state used that data.

While enumerators rarely encountered outright resistance at the doorstep, most had to deal with a pronounced displeasure at providing information in response to any of the questions asked

²²Prussian Ministries for the Interior and for Finances to all Oberpräsidenten of the Monarchy, 8 September 1871, Denkschrift zur Neuen Volkszählung (Memorandum concerning the New Census), GStA PK, HA I, Rep. 77, Tit. 94 no. 132 vol. 1, 137–139v.

²³Zusammenstellung und Begutachtung der Erfahrungen, Bedenken und Abänderungsvorschläge, welche die Herren Regierungs-Präsidenten bezw. Königlichen Regierungen und Landforsteien in ihren Berichten über die Ausführung der Volkszählung vom 1. Dezember 1880 niedergelegt haben, 10 July 1880, GStA PK, HA I, Rep. 77, Tit. 94 no. 148, vol. 3, 98–134, on 127R. See also: Engel 1875, 39 and 44.

²⁴Zusammenstellung und Begutachtung der Erfahrungen, Bedenken und Abänderungsvorschläge, welche die Herren Regierungs-Präsidenten bezw. Königlichen Regierungen und Landforsteien in ihren Berichten über die Ausführung der Volkszählung vom 1. Dezember 1880 niedergelegt haben GStA PK, HA I, Rep. 77, Tit. 94 Nr. 148, vol. 3, 98–134, on 126v.

²⁵Protokoll der 3. Sitzung der Konferenz von Vorständen deutscher statistischer Zentralstellen am 9. Oktober 1879 [= Anhang B des Protokolls der Bundesratssitzung no. 96, 12. Mai 1879], GStA PK, I. HA Rep. 77, Tit. 94, no. 148, vol. 1, 311–312.

(Schneider 2013, 237). It was not just workers and rural folk, but also most artisans in towns and cities who failed to display much sympathy or inclination to engage in self-inscription, complaining that the material was too comprehensive and hard to fathom. Such attitudes left the entire labor of inscribing to the enumerators. Their work, in turn, meant that authorities who were in charge of authenticating were kept quite busy. In some localities, correcting false entries ended up being tantamount to complete recounts.²⁶ Enumerators, overwhelmed by the burden of soaring responsibilities, withdrew from service once they became aware of what was involved, feeling not competent enough to instruct members of the household *and* to do the control work. Shrewder volunteers, especially in Berlin, struck deals with the custodians of large tenements to provide information and to distribute and collect the envelopes, leading respondents to complain that their data was fodder for gossip.²⁷

Overall, many enumerators who had volunteered in earlier counts complained that their job had become much more burdensome and time-consuming.²⁸ The new emphasis on hunting for correct and complete data took a toll on them. In an early example of a real-time reportage, journalist Hugo von Kupffer gave an account of these challenges. Von Kupffer volunteered as an enumerator for the 1880 census. Despite the cheerful tone of his newspaper article, his report highlights vividly what historians mean when they say that nineteenth-century enumeration took individuals (and no longer households) as its main target, teaching them to see themselves through the lens of new categories (Bouk 2017, 94). Kupffer's vivid portrayal reveals how difficult it was to turn real-life circumstances into the unambiguousness requested by the form, leading him to conclude that

the impeccably completed counting letter with absolutely no need for correction is a rare occurrence. Almost invariably, I had to make corrections. However, when lack of understanding guided the quill, then, holy statistics, may you hide away! I am inured to grease and ink blots . . . but when one finds all members of the household unsparingly marked as “male” or as “absent,” or “child” noted as occupation . . . or indignant remarks that “of course the servant is neither a relative nor related by marriage!,” then this shows a deplorable indifference to the anguish of the enumerator. Finally, when all of these cards are successfully worked through, the enumerator thinks with deep-drawn sigh: Thank God that this can only befall me every five years! (von Kupffer 2020, 164–165)²⁹

The general unwillingness to spend time with the forms had much to do with the layout of the cards and the fact that, even for the willing, some questions were not precise enough. The dotted

²⁶Zusammenstellung der Bedenken und Abänderungsvorschläge der königlichen Regierungen bzw. Landforstesten, die Volks- und Gewerbezahlung am 1. Dezember 1875 betreffend, nebst gutachtlichen Aeusserungen des königlichen statistischen Bureaus hierüber, GStA PK, HA I, Rep. 77, Tit. 94 no. 142 vol. 2, 365–374: 369 f.

²⁷Anonymous complaint of a “faithful subject” to the ministry of “geistlichen, Unterrichts- und Medicinal-Angelegenheiten,” 26 August 1884, GStA PK, I, HA Rep. 77 Tit. 94 no. 155 vol. 1, 32; complaint by Karl Wilke to the Ministry of the Interior, 11 June 1907, and reply by the Statistical Bureau explaining that locking envelopes was not feasible because the entries had to be checked upon retrieval, 24 June 1907 GStA PK, HA I, Rep. 77, Tit. 94 no. 151 vol. 8, 133.

²⁸Zusammenstellung und Begutachtung der Erfahrungen, Bedenken und Abänderungsvorschläge, welche die Herren Regierungspräsidenten bzw. die königlichen Regierungen in ihren Berichten über die Ausführung der Volkszählung vom 1. Dezember 1885 niedergelegt haben, GStA PK, HA I, Rep. 77, Tit. 94 no. 155 vol. 1, 313v.

²⁹“Der Zähler wird bei der Revision seiner Zählkarten und Ausfertigung der Kontrolllisten zu der überraschenden Erkenntnis kommen, dass ein *ganz* tadellos, vorschriftsmäßig ausgefüllter Zählbrief zu den allergrößten Seltenheiten gehört. Fast ausnahmslos ist noch eine Korrektur vorzunehmen. Wo aber direkte Verständnislosigkeit die Feder geführt, da—oh heilige Statistik, verbirg schauernd Dein Haupt! Gegen Fett- und Tintenflecke bin ich abgehärtet. Aber wenn man so wenig Interesse . . . hat, dass man mit Beharrlichkeit die dauerhaftesten Familienmitglieder auf die ‘Abwesenheitskarte’ setzt, . . . dass man schonungslos alle Mitglieder des Haushalts . . . als ‘männlich’ bezeichnet, . . . dass man . . . beim Dienstboten mit einem entrüsteten ‘weder verwandt noch verschwägert!’ antwortet . . . das zeigt eine tiefbeklagenswerte Gleichgültigkeit gegen die Seelenqualen eines Volkszählers. Wenn man sich durch solche Karten glücklich durchgearbeitet hat, dann ruft man mit einem Seufzer der Erleichterung aus. Gott sei Dank, so etwas kann einem höchstens in fünf Jahren einmal passieren.”

lines allotted for answering them also left too much room for guessing. The most difficult question to get right for respondents and official certifiers alike was certainly number seven on the 1871 counting card, which required information on main occupation and sideline jobs. Replies to this question were unusable to the point that the occupational statistics for the 1871 census could only be compiled in the most rudimentary fashion (Engel 1875, 233–235).

In their struggle to address these complaints, local authorities demanded that questions be phrased in a more colloquial way that explicitly addressed respondents, such as “What’s your name?” or “Are you male or female?” instead of bluntly stating “Name,” “Sex,” “Civil Status,” etc.³⁰ Yet in response to such claims, census officials sided with a small-town head official saying that “it is impossible to invent a form that is brief, useful, and comprehensible to everyone, including the man on the street.”³¹ This resonates with Peter Becker’s observation that nineteenth-century reformers saw the need to use administrative “acts of speech” to elevate the public rather than serve it (Becker 2011).

However, despite all such complaints, Prussian census statisticians stuck to the system and came to the conclusion that, overall, self-inscription worked quite well. In view of the feedback received from local authorities after the census of 1875, Engel concluded in his review summary that grave complaints about the method and calls to abolish it because it put too much of a burden on everyone involved were voiced only “very sporadically.” He added that, on the whole, most authorities across Prussia had come to “recognize counting cards and self-inscription as the better and more reliable method, adding that the judicious public has befriended and embraced the method.”³²

Census-taking via self-inscription was a long-term project, and results were expected to improve each time around, as more people got used to and embraced the census as a collective undertaking in the service of patriotism and accuracy. Therefore, the Statistical Bureau also explicitly rejected suggestions by some local officials to generally exempt all heads of households from self-inscription who were assumed or known to be unable to comply.³³

While census officials recognized the extra efforts that districts in areas with low levels of education had to make to return satisfying results back to Berlin, they were confident that each census would yield a higher percentage of cards that were actually self-inscribed. On the whole, they also relied on the fact that the overall amount of gathered data would even out moderate inconsistencies within the entries. Compared to the systemic inconsistencies they had exposed in the counts prior to the reform (Schneider 2013, 214–222), Prussian census officials were certain to have set new standards of accuracy, superior to any other method of gathering population data.

³⁰Zusammenstellung und Begutachtung der Erfahrungen, Bedenken und Abänderungsvorschläge, welche die Herren Regierungs-Präsidenten bezw. Königlichen Regierungen und Landforsteien in ihren Berichten über die Ausführung der Volkszählung vom 1. Dezember 1880 niedergelegt haben, 10 July 1880, GStA PK, HA I, Rep. 77, Tit. 94 Nr. 148, vol. 3, 98–134, on 102v.

³¹Zusammenstellung und Begutachtung der Erfahrungen, Bedenken und Abänderungsvorschläge . . . 10 July 1880, 101v.

³²Zusammenstellung der Bedenken und Abänderungsvorschläge der königlichen Regierungen bzw. Landforsteien, die Volks- und Gewerbezahlung am 1. Dezember 1875 betreffend, nebst gutachtlichen Aeusserungen des königlichen statistischen Bureaus hierüber, GStA PK, HA I, Rep. 77, Tit. 94 no. 142 vol. 2, 365–374, on 365v: “Gegen die nun schon öfter angewendete Methode der Zählung durch Individual-Zählkarten sprechen sich nur noch ganz vereinzelt Stimmen aus. Diese empfehlen die Rückkehr zum System, mittels Haus- und Haushaltungslisten zu zählen, weil dasselbe den zu Zählenden geringere Mühe und Arbeit verursache. Diesen wenigen Stimmen gegenüber erkennen jedoch die meisten übrigen Verwaltungsbehörden die Zählung mittels Zählkarten offen und ausdrücklich als die bessere und zuverlässigere Methode an und fügen hinzu, dass sich die urtheilsfähige Bevölkerung mit dieser Methode befreundet und in dieselbe hineingelebt habe.”

³³Zusammenstellung der Bedenken und Abänderungsvorschläge der königlichen Regierungen bzw. Landforsteien, die Volks- und Gewerbezahlung am 1. Dezember 1875 betreffend, nebst gutachtlichen Aeusserungen des königlichen statistischen Bureaus hierüber, GStA PK, HA I, Rep. 77, Tit. 94 no. 142 vol. 2, 365–374: 369v.

Precision's pitfalls

The heyday of the Prussian system of self-inscription via counting cards lasted for more than four decades. The tables and graphs produced in this way were widely admired by statisticians at home and abroad, but no statistical office outside German lands adopted the method. Instead, critics of the Prussian way of gathering and processing census information grew louder as the nineteenth century drew to a close, dismissing the census card as a blind alley blocking the way towards mechanization. Self-inscription as such was uncontroversial, but using counting cards with the hand-written *Ur*-data all the way through the process of tabulation was considered a constraining idiosyncrasy and proof of bureaucratic inertia towards technological innovation (Heide 2008). Prussia's statisticians, however, insisted that their reluctance to abandon their system was based on the epistemic grounds that counting cards with self-inscribed *Ur*-data ensured the most precise statistical description of the populace, unrivaled by mechanical tabulation, which required the transfer of all data onto punchcards (von Oertzen 2017).

The Prussian statisticians' sense of achievement notwithstanding, their system of self-inscription as an at-home scenario that would yield truthful information akin to a photographic record in scientific experimentation proved a goal impossible to come close to. Counting cards, after all, were not blank slates but bureaucratic forms that embodied technologies of power (Plener, Weber, and Wolf 2021, IV). And as such, the cards did much more than ask respondents for formalized personal information in order to produce commensurable data. The cards intruded into the intimate space of the home while also reshaping the hierarchies between the Statistical Bureau in Berlin as the center of calculation and the localities in which the data were gathered. Making the latter solely responsible and yet also giving them creative leeway to ensure that everyone accountable filled in their cards correctly fundamentally changed the dynamics of census taking. Counting cards unleashed a new scrutiny in the hunt for personal data on the ground. And because local authorities had to verify every entry and thus connect the data to each individual, their actions often stood in contrast to the noble aims of the census as an operation geared towards aggregates in which the particulars of individuals did not matter as such. The appetite for personal information and the ability to track it proved to be the dark side of the tectonics of power built into the census, as it grew fatally stronger than the state's stamina to maintain self-constraint (Aly and Roth, 2000). The project of aligning bureaucratic practices to scientific ideals of mechanical objectivity found its limits in the very power structures in which it was embedded. And therefore, being true to form remained an ideal rather than a reality achieved by counting cards and self-inscription. As a practice, however, being true to form (or not) evolved into a cultural technique that in the digital age, most of us have learned to master all too well.

Competing interests. The author declares none.

Bibliography

- Aly, Götz, and Karl-Heinz Roth. 2000. *Die restlose Erfassung. Volkszählen, Identifizieren, Aussondern im Nationalsozialismus*. Frankfurt/Main: Fischer.
- Anderson, Margaret. 1990. *American Census: A Social History*. New Haven: Yale University Press.
- Aronova, Elena, Christine von Oertzen, and David Sepkoski. 2017. "Historicizing Big Data." *Osiris* 32 (1): 1–17.
- Becker, Peter. 2008. "Beschreiben, Klassifizieren, Verarbeiten: Zur Bevölkerungsbeschreibung aus kulturwissenschaftlicher Sicht." In *Information in der Frühen Neuzeit: Status, Bestände, Strategien*, edited by Arndt Brendecke, Markus Friedrich, and Susanne Friedrich, 393–423. Münster: Lit Verlag.
- Becker, Peter. 2009. "Formulare als, Fließband' der Verwaltung? Zur Rationalisierung und Standardisierung von Kommunikationsbeziehungen." In *Eine intelligente Maschine? Handlungsorientierungen moderner Verwaltung (19./20. Jahrhundert)*, edited by Peter Collin and Klaus-Gert Lutterbeck, 291–308. Baden-Baden: Nomos Verlag.
- Becker, Peter. 2011. "'Das größte Problem ist die Hauptwortsucht.' Zur Geschichte der Verwaltungssprache und ihrer Reformen, 1750–2000." In *Sprachvollzug im Amt: Kommunikation und Verwaltung im Europa des 19. und 20. Jahrhunderts*, edited by Peter Becker, 219–246. Bielefeld: Transkript Verlag.

- Bosse, Heinrich.** 2012. "Die Schüler müssen selbst schreiben lernen' oder die Einrichtung einer Schiefertafel." In *Schreiben als Kulturtechnik: Grundlagentexte*, edited by Sandro Zanetti, 67–111. Frankfurt: Suhrkamp.
- Bouk, Dan.** 2015. *How Our Days Became Numbered: Risk and the Rise of the Statistical Individual*. Chicago: University of Chicago Press.
- Bouk, Dan.** 2017. "The History and Political Economy of Data Over the Last Three Centuries in Three Acts." *Osiris* 32: 85–106.
- Brückweh, Kerstin.** 2015. *Menschen zählen: Wissensproduktion durch britische Volkszählungen und Umfragen vom 19. Jahrhundert bis ins digitale Zeitalter*. Berlin/Boston: de Gruyter/Oldenbourg.
- Butte, Wilhelm.** 1808. *Die Statistik als Wissenschaft bearbeitet*. Landshut: Thormann.
- Campbell-Kelly, Martin.** 1998. "Information Technology and Organizational Change in the British Census, 1801–1911." *Information Systems Research* 7 (1): 22–36.
- Campe, Rüdiger.** 2003. "Barocke Formulare." In *Europa: Kultur der Sekretäre*, edited by Bernhard Siegert and Joseph Vogl, 79–96. Zurich/Berlin: Diaphanes.
- de Chadarevian, Soraya and Theodore Porter.** 2018. "Introduction: Scrutinizing the Data World." *Historical Studies in the Natural and Human Sciences* 48 (5): 549–556.
- Daston, Lorraine and Peter Galison.** 2007. *Objectivity*. New York: Zone Books.
- Desrosières, Alain.** 2007. *The Politics of Large Numbers: A History of Statistical Thinking*. Cambridge, MA: Harvard University Press.
- Donnelly, Kevin.** 2017. "Redeeming Belgian Science: Periodic Phenomena and Global Physics in Brussels, 1825–1870." *History of Meteorology* 8: 54–73.
- Engel, Ernst.** 1861. "Die Methoden der Volkszählung. Mit besonderer Berücksichtigung der im Preussischen Staate angewandten." *Zeitschrift des Königlich Preussischen Statistischen Bureaus* 1: 149–212.
- Engel, Ernst.** 1861b. "Über die Organisation der amtlichen Statistik mit besonderer Beziehung auf Preussen." *Zeitschrift des Königlich Preussischen Statistischen Bureaus* 1: 53–56.
- Engel, Ernst.** 1867. "Aktenmässige Darstellung der Vorbereitungen zu den statistischen Aufnahmen im December 1867, insbesondere der Volkszählung im preussischen Staate und norddeutschen Bundesgebiete." *Zeitschrift des Königlich Preussischen Statistischen Bureaus* 7: 263–321.
- Engel, Ernst.** 1870. "Die Kosten der Volkszählungen mit besonderer Rücksicht auf die im December 1870 im preussischen Staate bevorstehende Zählung." *Zeitschrift des Königlich Preussischen Statistischen Bureaus* 10: 33–58.
- Engel, Ernst.** 1875. "Die Ergebnisse der Volkszählung und Volksbeschreibung im Preussischen Staate vom 1. December 1871." *Preussische Statistik* 30: 39–44, 235–237.
- Felten, Sebastian and Christine von Oertzen.** 2020. "Introduction: Bureaucracy as Knowledge." *Journal for the History of Knowledge* 1 (1): 1–16.
- Fischer, Philipp, Gabriele Gramelsberger, Christopf Hoffmann, Hans-Jörg Rheinberger, and Hannes Rickli** (eds.) 2021. *Datennaturen. Ein Gespräch zwischen Biologie, Kunst, Wissenschaftstheorie und -geschichte*. Zurich: Diaphanes.
- Gitelman, Lisa.** ed. 2014. *"Raw Data" Is an Oxymoron*. Cambridge, MA: MIT Press.
- Gitelman, Lisa.** 2014. *Paper Knowledge: Toward a Media History of Documents*. Durham: Duke University Press.
- Götting, J.** 1913–1917. "Schreibunterricht." In *Lexikon der Pädagogik*, vol. 4, edited by Ernst Maximilian Roloff, 629–642. Freiburg im Breisgau: Herder.
- Gottschalk, Karin.** 2004. "Wissen über Land und Leute: Administrative Praktiken und Staatsbildungsprozesse im 18. Jahrhundert." In *Das Wissen des Staates: Geschichte, Theorie und Praxis*, edited by Peter Collin and Thomas Horstmann, 149–175. Baden-Baden: Nomos.
- Hacking, Ian.** 1990. *The Taming of Chance*. Cambridge, MA: Cambridge University Press.
- Heide, Lars.** 2008. "Punched Cards for European Offices: Revisiting the dynamics of information technology diffusion from the United States to Europe, 1889–1918." In *History and Technology* 24 (4): 307–320.
- Higgs, Edward.** 2004. *Life, Death and Statistics: Civil Registration, Censuses and the Work of the General Register Office, 1836–1952*. Hatfield: Local Population Studies.
- His, Wilhelm.** 1880. *Anatomie menschlicher Embryonen*. Leipzig: Vogel.
- Horstmann, Jan-Philipp.** 2020. *Halbamtliche Wissenschaft: Internationale Statistikkongresse und preußische Professorenbürokraten*. Tübingen: Schöningh.
- Kaufmann, Alexej.** 1913. *Theorie und Methode der Statistik*. Tübingen: J.C.B. Mohr.
- Knapp, Georg Friedrich.** 1867. "Das Verfahren bei der preussischen Volkszählung." *Zeitschrift des Königlich-Preussischen Statistischen Bureaus* 7: 1–30.
- Krüger, Lorenz, Lorraine Daston, and Michael Heidelberger** (eds.). 1987. *The Probabilistic Revolution. Vol. 1: Ideas in History*. Cambridge, MA: MIT Press.
- Kupffer, Hugo von.** 2020. [1890] "Im Dienste des Census." In *Reporterstreifzüge: Die ersten modernen Reportagen aus Berlin*, edited by Fabian Mauch, 160–165. Berlin: Lilienfeld.

- Latour, Bruno.** 1987. *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA.: Cambridge University Press.
- Ledebur, Sophie.** 2023. "Evidence of Undercounting: Collecting Data on Mental Illness in Germany (c. 1825-1925)." *Science in Context* 34 (4): 459–478.
- Lemov, Rebecca.** 2015. *Database of Dreams: The Lost Quest to Catalog Humanity*. New Haven: Yale University Press.
- Leonelli, Sabina.** 2016. "Epistemische Diversität im Zeitalter von Big Data. Wie Dateninfrastrukturen der biomedizinischen Forschung dienen." In *Diversität: Geschichte und Aktualität eines Konzepts*, edited by André Blum, Nina Zschocke, Hans-Jörg Rheinberger, and Vincent Barras, 85–106. Würzburg: Königshausen und Neumann.
- Levitan, Kathrin.** 2017. *A Cultural History of the British Census: Envisioning the Multitude in the Nineteenth Century*. New York: Palgrave MacMillan.
- Mayr, Georg von.** 1877. *Die Gesetzmäßigkeit im Gesellschaftsleben: Statistische Studien. Die Naturkräfte: Eine naturwissenschaftliche Volksbibliothek*, vol. 14. Munich: Oldenbourg Verlag.
- Mayr, Georg von.** 1893. "Meine Kritik der preussischen Volkszählungsformulare." *Allgemeines Statistisches Archiv* 3: 164–182.
- Mayr, Georg von.** 1914. *Statistik und Gesellschaftslehre*. Tübingen: Mohr (Paul Siebeck).
- Neumann, S[alomo].** 1864. "Agenten oder Selbstzählung? Virulente Diskussion auf der Berliner Zusammenkunft des Internationalen Statistischen Kongresses 1863." *Zeitschrift des Königlich-Preussischen Büros* 4: 10–13.
- Oertzen, Christine von.** 2017. "Machineries of Data Power: Manual versus Mechanical Census Compilation in Nineteenth-Century Europe." *Osiris* 32: 129–150.
- Oertzen, Christine von.** 2018. "Datafication and Spatial Visualization in Nineteenth-Century Census Statistics." *Historical Studies in the Natural Sciences* 48 (5): 568–580.
- Oertzen, Christine von.** 2019. "Keeping Prussia's House in Order: Census Cards, Housewifery, and the State's Data Compilation." In *Working with Paper: Gendered Practices in the History of Knowledge*, edited by Carla Bittel, Elaine Leong, and Christine von Oertzen, 108–123. Pittsburgh: University of Pittsburgh Press.
- Oertzen, Christine von.** 2020. "Prussian Census Box: Moving and Freezing Data." In *Boxes: A Field Guide*, edited by Martina Schlünder, Susanne Bauer, and Maria Rentetzi, 473–481. Toronto: Mattering Press.
- Olesko, Kathryn.** 2020. "The *Indaganda* Survey of the Prussian Frontier: The Built World, Logistical Power, and Bureaucratic Knowledge in the Polish Partitions, 1772–1806." *Journal for the History of Knowledge* 1 (1): 16.
- Plener, Peter, Niels Weber, and Burkhardt Wolff.** Eds. 2021. *Das Formular*. Berlin: Metzler (Springer).
- Porter, Theodore.** 1985. *The Rise of Statistical Thinking, 1820–1900*. Princeton: Princeton University Press.
- Porter, Theodore.** 1995. *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton: Princeton University Press.
- Porter, Theodore.** 2003. "Statistics and Statistical Methods." In *The Cambridge History of Science*, vol. 7, edited by Theodore Porter and Dorothy Ross, 238–250. Cambridge: Cambridge University Press.
- Porter, Theodore.** 2011. "Reforming Vision: The Engineer Le Play Learns to Observe Society Sagely." In *Histories of Scientific Observation*, edited by Lorraine Daston and Elizabeth Lunbeck, 281–302. Chicago: University of Chicago Press.
- Porter, Theodore.** 2018. *Genetics in the Madhouse: The Unknown History of Human Heredity*. Princeton: Princeton University Press.
- Radin, Joanna.** 2017. "'Digital Natives': How Medical and Indigenous Histories Matter for Big Data." *Osiris* 32 (1): 43–64.
- Randeraad, Nico.** 2011. "The International Statistical Congress (1853–1876): Knowledge Transfers and their Limits." *European History Quarterly* 41: 50–65.
- Rheinberger, Hans-Jörg.** 2011. "Infra-Experimentality: From Traces to Data, from Data to Patterning Facts." *History of Science* 49: 337–348.
- Rosenberg, Daniel.** 2018. "Data as Word." *Historical Studies in the Natural Sciences* 48 (5): 557–567.
- Schaffer, Simon.** 1988. "Astronomers Mark Time: Discipline and the Personal Equation." *Science in Context* 2 (1): 115–145.
- Schlözer, Ludwig August.** 1804. *Theorie der Statistik: Nebst Ideen über das Studium der Politik überhaupt*. Göttingen: Vandenhoeck und Rupprecht.
- Schmidt, Daniel.** 2005. *Statistik und Staatlichkeit*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Schmidt-Bachem.** 2011. *Aus Papier: Eine Kultur- und Wirtschaftsgeschichte der Papier verarbeitenden Industrie in Deutschland*. Berlin: de Gruyter.
- Schneider, Michael.** 2013. *Wissensproduktion im Staat: Das Königlich-Preussische statistische Bureau, 1860–1914*. Frankfurt am Main: Campus.
- Schweber, Libby.** 2006. *Disciplining Statistics. Demography and Vital Statistics in France and England, 1830-1885*. Durham: Duke University Press.
- Sepkoski, David.** 2018. "Data in Time: Statistics, Natural History, and the Visualization of Temporal Data." *Historical Studies in the Natural Sciences* 48 (5): 581–593.
- Siegert, Bernhard and Joseph Vogl** (eds). 2003. *Europa: Kultur der Sekretäre*. Zurich/Berlin: Diaphanes.

- Stollberg-Rillinger, Barbara and André Krischer.** 2010. *Herstellung und Darstellung von Entscheidungen. Verfahren, Verwalten und Verhandeln in der Vormoderne.* Berlin: Duncker und Humblot.
- Vismann, Cornelia.** 2011. *Akten: Medientechnik und Recht.* Frankfurt am Main: Fischer.

Christine von Oertzen is Principal Investigator of the research group “Data, Media, Mind” at the Max Planck Institute for the History of Science (Dept. II) and a professor in the Media Studies Department at the Humboldt University in Berlin. She has published widely on gender relations in society and science. Her current research focuses on the material culture and epistemologies of personal data. It engages with media and gender studies, the histories of bureaucracy, and the social, human, and cognitive sciences. Her publications include *Data Histories*, a special issue of *Osiris* (2017), edited with Elena Aronova and David Sepkoski; *Working with Paper: Gendered Practices in the History of Knowledge* (2019), edited with Carla Bittel and Elaine Leong; and *Histories of Bureaucratic Knowledge*, a special issue of the *Journal for the History of Knowledge* (2020), edited with Sebastian Felten.