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From Card Index to Book Index: Julius Otto Kaiser's Application of Systematic Indexing to Book Indexing

Abstract

Julius Otto Kaiser (1868-1927) is best known today as the developer of a distinctive methodology for the creation of subject indexes known as Systematic Indexing (SI). This indexing system, which included such features as the partition of index terms into distinct semantic categories and the combination of terms into compound subject strings according to a strictly defined syntax, is considered to be a forerunner of faceted subject indexing and it is as such that it features in the historiography of knowledge organization. This canonical profile of SI is based on rules that Kaiser established for the creation of card indexes. Yet Kaiser also developed a version of SI for book indexing, which differs, in many respects, from the form of this system enshrined in the canonical profile. The purpose of this study is to examine Kaiser's application of SI to book indexing, considering both points of commonality with, and points of divergence from, his method of card indexing. It begins with an account of Kaiser's theoretical framing of the distinction between book and card indexes, as well as his arguments for the essential unity underlying these two kinds of index. Then comes an examination of his stipulations for the structuring of entries in the book index, which are compared to his rules for the creation of index items in the card index and evaluated in light of current literature on book indexing. This is followed by a discussion of Kaiser's rules for the arrangement of terms in the book index, which again is brought into comparison with the organization of card indexes according to the tenets of SI. The study concludes with a brief reflection on how the book index version of SI stands in continuity with, and yet represents a significant departure from, the canonical card index version of the system.

1. Introduction

Julius Otto Kaiser (1868-1927) is best known today among students of knowledge organization (KO) as the developer of a distinctive methodology for the creation of subject indexes that he termed Systematic Indexing (hereafter, SI). Notable features of SI included the partition of all indexing terms within an index into three distinct categories – Concretes, Countries, and Processes (Kaiser 1911, §§ 298-301); the combination of indexing terms falling within these categories into "statements", or compound subject strings, according to a syntax that limited such strings to a restricted set of admissible patterns (namely [Concrete]–[Process], [Country]–[Process], [Concrete]–[Country]–[Process] (var. [Country]–[Concrete]–[Process] (§ 302); the use of statements to index isolated pieces of information found within the documents of a particular library (§§ 305, 354); the arrangement of these indexed pieces of information according to the alphabetical order of the index terms composing the statements (§§ 389-390); and the correlation of related index terms through cross-references (§§ 183, 414-417). All of these aspects of Kaiser's indexing system have received sustained scholarly attention in recent years (e.g., Dousa 2011, 2013, 2014a, 2014b; Sales 2014; Sales & Guimarães 2017; Svenonius 1978) and so form the essential features of

the present-day canonical profile of SI within the historiography of KO,[1] which tends to characterize it as an early form of faceted indexing.

An essential element in the constitution of SI was the context for which it was created—the card index. In the late 19th and early 20th centuries, the card index was rapidly finding favor as a mechanism for organizing documents and information in the commercial world (Dousa 2013, 32-33) and Kaiser, who spent his career working in business and technical special libraries and information bureaus in the United States and the United Kingdom (Sales 2014, pp. 65-66, Quadro 1), developed his indexing system to be implemented within the framework of this relatively novel form of information technology. According to the protocols of SI, individual "*index items*" (Kaiser 1911, § 305) comprising of statements—i.e., compound subject headings—and "amplifications"—i.e., synopses of the information being indexed by the statements accompanied by data about the date and source of the information (§§ 304, 350)—were designed to be entered upon unit cards in accordance with well-defined formatting rules (Dousa 2013, 538-546; Kaiser 1911, §§ 375-380; cf. Section 3.2 below), while guide cards served both to indicate the positions of individual subjects within the alphabetically organized card file and to list cross-references to related terms of potential interest to users of the index (Dousa 2013, 583-594, 602-658; 2014b, 164; Kaiser 1911, §§ 399-432). The formal features of SI were thus intimately intertwined with the particularities of the card index system as a material environment.

The current canonical profile of Kaiser's indexing system is based entirely on the form of SI that he created for use in the card index. This picture of SI is in large part justified, for Kaiser clearly envisioned the card index as the primary locus of application for his indexing method: indeed, he published his seminal treatise *Systematic Indexing* as the second volume of a series of books that he titled "The Card Index Series" (Kaiser 1911, t.p.; cf. Dousa 2013, 31-32; Sales 2014, 119). However, it is incomplete, for, in addition to the form of SI that Kaiser devised for use in card indexes, he developed a variant version for the creation of book indexes, which he applied not only to the indexing of his own books (Kaiser 1908, § 367; 1911, § 664) but also to the indexes that he compiled for the publications of Joseph Chamberlain's Tariff Commission (Dousa 2013, 55, 176-178; 2021, 8-10), the organization for which he worked in the years that he was formulating the fullest codification of his system.[2] Although past commentators on Kaiser's methodology of indexing have noted

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[1] The canonical profile of a given historical knowledge organization system is the picture of its general structure and most significant features as constructed by historians of KO in the light of the theoretical interests of their own day. Such a profile, which is perforce selective and simplifying, constitutes the form by which the knowledge organization system in question enters the disciplinary consciousness of the KO community and forms the basis for the place that it holds within the standard historical narratives of the development of KO. For further discussion of this historiographical concept, see Dousa 2013, 3-5.

[2] Despite its official-sounding name, the Tariff Commission was not a British government body but rather a research organization-cum-political pressure group established by the British politician Joseph Chamberlain (1836-1914) to provide evidence for the economic desirability of establishing a customs union among the countries of the British Empire and instituting tariffs against foreign powers. For more on the Tariff Commission and its aims, see Dousa 2013, 139-163; 2021, 8-10. Kaiser worked for the Tariff Commission from 1904 until 1911.

in passing the existence of this secondary version of SI (Dousa 2013, 13, n. 3, 176-178; 2021, 10), it has not, to date, been an object of study in its own right. And yet, the application of SI to book indexing is a subject of no small interest for our understanding of Kaiser's indexing system (cf. Dousa 2013, 898-900). Although Kaiser readily conceded that the card index and the book index constitute two different kinds of index and that their surface appearance is, in many respects, dissimilar, he maintained that both are, on a fundamental level, based on "the same or similar methods" of construction (Kaiser 1911, § 627). An examination of his extension of SI to the indexing of books thus affords us an opportunity to observe how a historical knowledge organization system (KOS) developed for a particular context was adapted for use in another quite different setting and to consider what kinds of changes such adaptation entailed.

The purpose of this paper, then, is to examine Kaiser's application of SI to book indexing, considering both its points of divergence from, and points of commonality with, his method of creating a card index. It begins with an account of Kaiser's theoretical framing of the distinction between book and card indexes, as well as his arguments for the essential unity underlying these two kinds of index. Then comes an examination of his stipulations for the structuring of entries in the book index, which are compared to his rules for the creation of index items in the card index and evaluated in light of current literature on book indexing. This is followed by a discussion of Kaiser's rules for the arrangement of terms in the book index, which again is brought into comparison with the organization of card indexes according to the tenets of SI. The study concludes with a brief reflection on how the book index version of SI stands in continuity with, and yet represents a significant departure from, the canonical card index version of the system.

2. Interminable vs. Terminable Indexes

According to Kaiser (1911, §572), the card index and the book index have a number of basic features in common. They deal with the same "prime material"—namely, "literature", or information presented in the form of text.[3] They have the same function—namely, "to provide access to the original information" to which they refer the index user. Moreover, they are "composed of the same elements"—namely "names", or index terms—and, because of this, they both follow "the same arrangement", namely alphabetical order (cf. Section 4 below).[4] Nevertheless, the card index and the book index also differ in significant ways. At a rather elementary level, they involve different physical media. As Kaiser defined it, "the card index is an index arranged by means of cards" and, as such, is "an index to information selected in the form of cards" (§ 663, s.v. "Card Index and Book Index). By contrast, the book index is "an index to the text of a book" and, as such, is "an index to

[3] On Kaiser's view of the relationship between literature and information, see Kaiser 1911, §§ 52, 53, 297, 663, s.v. "Analysis of Literature", with Dousa 2013, 297-299; 2014a, 302-303; Svenonius 1978, 135.

[4] It should be noted that Kaiser (1911, §§ 178, 389) held alphabetical ordering to be the only form of organization suitable for index terms and categorically rejected the classified arrangement of such terms, claiming that cross-references would supply any necessary elements of classification.

information in the text made in the form of book pages." The physical difference between an index embodied in card files and one instantiated in the pages of book is surely significant in determining the form that they take. Much more fundamental, however, in Kaiser's view, is the fact that they represent two very different kinds of indexes, which he termed "interminable" and "terminable", respectively (§ 572). Let us consider these more closely.

As Kaiser envisioned it, the role of a card index is to provide access to information scattered across all the different kinds of literature—published and unpublished—held by a special library or, in his parlance, the "intelligence department" of an organization (Kaiser 1911, §§ 15, 42-50). Now the contents of such a library are not static but rather in a constant state of flux and growth as new publications or unpublished documents are acquired and processed, with the result that fresh pieces of information must be incorporated into the index: in Kaiser's words, "we index day by day what new information makes its appearance so far as our business is concerned" (§ 573).[5] A card index thus is open to indefinite further expansion in terms of the materials it covers and it is this open-endedness that renders it "interminable". A book index, on the other hand, limits itself to the coverage of "a definitely limited quantity of material to handle" (§ 575)—namely, "the text of a book" (§ 573). Because the textual content of a book is finite, so is the index associated with it: as Kaiser put it, "[w]hen we make an index to it [sci., the textual content of a book—TMD], we do it for once and for all, it is finished and permanent" (§ 575). Insofar as the book index is "complete in itself, … closed, … [and] permanent" (§ 572), it is "terminable".[6]

The open-ended nature of the card index *qua* interminable index and the bounded nature of the book index *qua* terminable index entail other properties that differentiate these two types of index and call for divergent strategies in the application of the basic elements of SI. According to Kaiser (1911, § 573), the cardinal property of the interminable index is the unpredictability of its growth over time:

> The daily supply, the daily additions [sci., to a card index--TMD] do not give us any help in determining the construction of our index, any subject may appear at any time, it may have a run for some time, it may stop short, only to reappear at some future time; several quite distinct subjects may claim our attention simultaneously, at other times there may perhaps be nothing at all worth

[5] For Kaiser (1911, §§ 45-47, 89-97, 309), it was axiomatic that a special library, or intelligence department, would selectively index the information contained in its collection of literature, including only those subjects that were of interest to the organization of which the library formed part (cf. Dousa 2013, 201-202, 292-295).

[6] At first blush, Kaiser's distinction between interminable and terminable indexes seems to bear close analogy to Klement's (2002) distinction between "open-system" and "closed-system" indexing: cf., for example, Mulvany 2005, 4, who writes that "[o]pen-system indexing often deals with collections that grow, whle the focus of closed-system indexing is on a text that is static and fixated in a particular form." However, closer consideration reveals that these two sets of distinctions are not entirely conceptually congruent. The core of Klement's distinction is that "[c]losed-system indexing assists people in finding a unit or units of relevant information *within a document*, while open-system indexing is designed to facilitate the retrieval of one or more *documents* that contain relevant information" (pp. 23-24). The characterization of closed system indexing as having to do with locating information within a given document is compatible with Kaiser's view of the book index as a terminable index; however, the statement that the goal of open-system indexing is to retrieve documents containing relevant information runs athwart of Kaiser's (1911, §§ 12-13) insistence that indexing as such is concerned exclusively with information retrieval and never with document retrieval.

> noting. Under some subjects we may accumulate a few hundred cards in a very short time, while for other subjects we may make but a few cards during a much longer period.

In Kaiser's view, the designer of a card index must compensate for the lack of predictability in the growth of its contents by endowing it with a stable structural framework that would give its organization an inner coherence. This entails determining the "fixed points", or "constant elements" of conceptual structure, that can provide the foundational coordinates for such a framework (§§ 574, 663, s.v. "Fixed Point"). For Kaiser, the fixed points of a card index constructed according to the protocols of SI are the three categories of subject terms – Concretes, Countries, and Processes – representing "the elements of the information conveyed by literature" (§ 302), as well as their combination into the compound subject strings that he called statements (§§ 574, 645; cf. Section 1 above). Strict syntactic rules govern the indexer's construction of statements: the first term in the string must always be a Concrete or a Country and the final term, always a Process (§ 574; cf. Section 1 above and Sections 3.3, 4 below). Kaiser held that consistently formulated and syntactically correct statements are the indispensable foundation for a properly organized interminable card index: as he averred, "[w]e must make due allowance for a large number of possible contingencies, hence the stringency in the formulation of the statement, which contains the fixed points on which our entire structure must rest" (§ 574).

The terminable book index, on the other hand, poses a different set of conditions for indexing. Because any given book contains a fixed and finite quantity of text, the problem of unpredictability simply does not arise: the indexer has the entire text to be indexed available to him or her at the outset of his or her work. The indexer thus has scope to tailor the index to the particular contours of the book's presentation of its subject content (Kaiser 1911, § 575). To be sure, this does not obviate the need to use the same structural elements for the book index as for the card index:[7] as Kaiser asserted, "we must needs use … for terminable indexes the same constant elements [sci., the term categories of Concrete, Country, and Process—TMD] as before … . All that has been said previously about the statement of index items remains … in force. We must still formulate the statement for each entry" (§ 577). Nevertheless, the form of the statement in a book index can undergo certain modifications. For example, insofar as an indexer can ascertain how many times a given subject is discussed in a book, he or she has greater leeway to adjust the forms of statements in light of the size of entries. Thus, as Kaiser observed, in a book index, "very often the statement of the item will be reduced to one term, a proceeding which would be quite inadmissible in a card index …" (§ 576): by the same token, "in a terminable index only the larger headings may ultimately retain the complete statement, the smaller headings being often adequately dealt with either one of the three terms concrete, country, process, or sometimes by two of them" (§ 577). In other words, the syntactic structure of statements, the integrity of which is so fundamental to the constitution of the card index *qua* interminable index, is open to adjustment by reduction in the book index *qua* terminable index. It is for this reason that

[7] Cf. Kaiser 1911, § 579: "[T]here is no doubt that from the standpoint of modern methods the book index must be derived from the card index … ."

Kaiser considered "terminable indexes" to be "abbreviated or accommodated interminables" (§ 579) and the book index to be, in essence, "an abbreviated card index" (§ 627).

For Kaiser, then, a book index is, in principle, a modified form of the card index. The loosening of syntactic requirements for the formulation of statements is not the only change that the shift from an interminable card index to a terminable book index entails. These changes, which adapt the tenets of SI to the formal exigencies of an index presented in the pages of a book, lead to some far-reaching differences between the two versions of SI. These differences are best seen when one examines the structure and format of the basic index unit of the book index, namely the entry, and compares it to the canonical features of the corresponding index unit of the card index version of SI, namely the index item. Accordingly, it is to a closer consideration of the entry in the book index version of SI that we now turn.

3. The Book Index Version of SI: Forms and Structures

Current authorities on indexing hold that, in its fullest form, the basic indexing unit of the book index, known as an *entry*, can be resolved into four elements: (1) a main heading, or simply *heading*, which is the term indicating a particular subject treated in a book; (2) *subheadings*, which are terms or phrases indicating some special aspect of the subject that is discussed in the book; (3) references, reference locators, or simply *locators*, which are signs, typically numbers, that indicate the places in the book where discussion of the subject indicated by the entry and its aspects indicated by the subheadings are to be found; and (4) *cross-references*, which direct the user of the index to other entries in the index representing subjects that bear a strong relation to the subject of the heading (Mulvany 2005, 17-19, 78; cf. Browne & Jermey 2007, 28; Knight 1979, 19).[8] The first and third of these elements (i.e., heading and locator) are obligatory, while the others (i.e., subheadings and cross-references) are optional. Although Kaiser did not provide formal definitions for these features of book index entries in his writings and used a different, somewhat idiosyncratic terminology to refer to them,[9] the structure of entries in his book indexes conform, in the main, to this basic pattern, and so, for the sake of clarity and simplicity, we shall adhere to current terminology here.

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[8] Some writers on indexing prefer to speak of the entry, as defined above, as an "entry array" and reserve the term "entry" for any main heading or subheading and its corresponding locator(s) (Browne & Jermey 2007, 28-29; Wellisch 1995, xvi, s.v. "entry" and "entry array"). Although such a distinction has some utility for certain kinds of analyses of book indexes (such as determining the cost of preparing an index), we prefer to use the more traditional terminology here. It should be noted, however, the Kaiser used the term "entry" in the sense given here; cf. n. 9 and Section 3.3 below.

[9] Kaiser used "heading" to refer to the entry as a whole (e.g., Kaiser 1911, §§ 612-613) and "entry" to refer to a combination of a heading and locator or a subheading and locator (§§ 602, 604; cf. n. 9 above); "heading", "term", or "index term" to refer to the heading (e.g., §§ 589, 597, 605, 610); "subdivisions" to refer to subheadings (e.g., §§ 613-620); "numbers" or even "call numbers" to refer to locators (e.g., §§ 591, 597); and "related terms" to refer to cross-references (§ 590).

Having identified the four standard elements of a book index entry, we shall examine each of them in turn, beginning with the obligatory elements – i.e., heading and locators – and then proceeding to the facultative ones – i.e., subdivisions and cross-references. We shall consider the formal features of each element, giving examples from Kaiser's own indexes; appraise how well they conform to current norms for book indexes; and compare them, where appropriate, to analogous elements in the indexing units of the card index. Such a procedure will allow us to discuss Kaiser's book indexing protocols as they relate both to the book index *simpliciter* and to the book index as a particular version of SI. Let us begin by turning to the heading.

3.1. The Heading

In SI, the heading of an entry comprises an "index term" (Kaiser 1911, § 597) and, as such, represents the name of a subject (§§ 73, 317, 664 s.v. Concrete and Record). As already noted earlier, Kaiser divided all index terms into three categories: Concretes, which in the most general sense, denote things in the world (§§ 52, 299);[10] Countries, which encompass political jurisdictions and other geographical locales (§§ 300, 332); and Processes, which refer to actions performed on or by Concretes or, more generally, "conditions attaching to them" (§§ 52, 298, 301).[11] [12] We have also seen that, when index terms are combined to form statements within the framework of the card index, the protocols of SI allow only terms for Concretes or Countries to serve as the first element, or main heading, of the statement (§§ 302, 313, 384-385). By contrast, Kaiser stipulated that, in a book index, terms for Processes as well as those for Concretes and Countries could serve as the heading

[10] Because Kaiser (1911) developed SI for card indexes dealing primarily with information from commercial literature, he also specified that Concretes represent "commodities having an exchange value" (§ 298). Although the latter, domain-specific nuance of the term looms large in his discussions of the category, it is not strictly relevant for our purposes and so will not be further discussed here. For a full discussion of the definition of Concretes in SI, see Dousa 2011, 161-164; 2013, 402-413; 2015, 64-67.

[11] For a full discussion of the definition of Processes in SI, see Dousa 2011, 166-168; 2013, 426-448.

[12] The apparent simplicity of this tripartite division masks a complex and rather tangled theoretical background. On one hand, Kaiser (1911) presented in his writings a rationale for the categories of Concrete and Process by claiming that they represent the two basic ontological categories around which human experience is structured (§§ 52-53) and by assimilating them, respectively to the logico-grammatical categories of subject and predicate (§§ 298, 301). For further discussion, see Dousa 2011, 168-169; 2013, 350-351, 430-432, 448. On the other, Kaiser's indexing system seems to have drawn inspiration from the knowledge organization régime at the Philadelphia Commercial Museum, where he worked as librarian between 1896 and 1899. At that institution, the goal of which was to promote American commerce with foreign countries, both the museum exhibits and the card files in the library were structured around two primary categories—trade products and countries—, which appear to have been the antecedents for the SI categories of Concretes and Countries; see Dousa 2013, 99-107, 475; 2021, 6-7, 20-21. In order to allow for the presence of Countries within the "grammatical model" (Svenonius 2001, 47) of Concrete *qua* subject and Process *qua* predicate, Kaiser (1911, § 300) developed a theoretically rather tenuous argument wherein Countries represent a special subclass of Concretes (cf. Dousa 2011, 164-166, 417-420, 449; Svenonius 1978, 137). Whatever its theoretical merits, this argument provided justification for the treatment of Concretes and Countries as syntactically interchangeable within the structure of statements in SI. Coupled with the stipulation that Concretes should be given priority to Processes in the formulation of statements, this entailed that, in SI, a statement always begins with a Concrete or a Country.

of an entry (§ 600). We shall discuss the rationale for this move in Section 4 below. For the time being, it suffices to note that a term from any of the three term categories of SI – Concrete, Country, or Process – could serve as a heading in a book index.

Kaiser was careful to establish rules for the forms that terms used as headings in the card index version of SI are to take. As names of things, terms for Concretes generally are common nouns, such as `Machine`, `Cattle`, or `Watch`, and noun phrases consisting of a head noun with nominal or adjectival modifiers, such as `Sewing Machine`, `Card Cabinet`, `Commercial Traveller`, `Wrought Iron Ornament`, `Direct Current Engine Type Generator`, and so on (Kaiser 1911, § 317, 326). Terms for concretes "should always be as specific as possible" (§ 319). In all cases, inversion of noun phrases (e.g., `Copper, Black` instead of `Black Copper`) are to be strictly avoided (Kaiser 1911, §§ 225-226, 318; cf. Kaiser 1908, § 101).[13] If at all possible, terms for Concretes are to be cast in the singular form (Kaiser 1908, § 102; 1911, § 319) on the grounds that the use of the singular not only helps indexers to evade certain difficulties in alphabetical filing occasioned by plural forms in English[14] but also is "more correct logically and more economic both in writing and filing" (§ 397). Similarly, "[p]repositional terms should be avoided wherever possible because prepositions are apt to create confusion in filing" (§ 323): thus, for example, a form such as `Calcium Carbide` is always to be preferred to `Calcium of Carbide`. In cases where there might be uncertainty in meaning, the semantic referent of the term is to be specified with additional "terms in brackets", that is, qualifiers (§ 321): for example, the term `File` is better formulated as `File(Tool)` or `File(Furniture)`. Terms for Countries, by contrast, pose few problems with regard to their form: an indexer is to use the conventional English names for them – e.g., `United States of America`, `United Kingdom`, `South America`, or `Europe` – (§ 332), though one may prefer to use abbreviations, such as `USA` for `United States of America`, `UK` for `United Kingdom`, `S America` for `South America`, and so on (§ 339). Once again, inversions of terms were strictly forbidden and the use of prepositions strongly discouraged (§ 340). As for terms for Processes, Kaiser held that, although they are verbal in meaning because they primarily denote actions, they need not be grammatically expressed as verbs (§ 344): thus, in SI, they typically take the form of nouns, such as `Manufacture`, `Cultivation`, and `Negotiation`, or gerunds, such as `Spinning`.[15] Here, too, inversion is interdicted and the use of prepositions, strongly discouraged (§ 345): thus, for example, `Customs Classification` is to be used rather than `Classification, Customs` or `Classification of Customs`.

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[13] For a full discussion of Kaiser's arguments against inversion, see Dousa 2013, 572-577.

[14] The avoidance of plural forms precludes the possibility of having a term like `Watch Cases` precede the term `watches` (Kaiser 1911, § 397). In such cases, Kaiser thought it proper that the focal term `Watch` precede any other terms featuring the word "watch" as a modifier in a noun phrase (e.g., `Watch Case`, `Watch Hand Case`, and so on (cf. § 395).

[15] Rarely, terms for Processes can take adjectival forms, such as `Available` and `Undesirable` (Kaiser 1911, §§ 455, 457). Such terms typically denote Processes *qua* conditions rather than Processes *qua* actions. For discussion, see Dousa 2013, 444-445.

These, then, are the basic rules for forming index terms in the card index version of SI.[16] Kaiser did not add any further stipulations regarding the form of headings in his discussion of book indexing: from this, one may infer that he considered these guidelines to be valid, by and large, for the book index as well. He did, however, suggest that the headings in a book index be typographically distinguished from the rest of the entry by being set in a visually more conspicuous typeface (Kaiser 1911, § 589). A glance at the indexes that Kaiser created reveals that he indeed practiced what he preached on this score: in the index of his first book, *The Card Index at the Office* (hereafter, *Card System*), the headings in the index are rendered in bold capital letters, while subdivisions are rendered in regular capital letters of a smaller font size and cross-references in lowercase (Kaiser 1908, § 367; cf. Figure 4 below); in his second book, entitled *Systematic Indexing*, the headings were set in boldface while the other elements of the entry were set in regular type (Kaiser 1911, § 664; cf. Figures 1 below); and, in his indexes for the reports of the Tariff Commission, the headings were set in capital letters, while other parts of the entry were set in lowercase type (e.g., Tariff Commission 1904; 1907, Index; cf. Figure 8 below).

A perusal of the book indexes created by Kaiser shows that they conformed to the SI rules for term formation with varying levels of fidelity. The headings in the indexes to his own books generally upheld the rule that all terms for Concretes take the singular form, although exceptions do occur, such as `Capital Letters` and `Charging Slips` in the index to *Card Index* (Kaiser 1908, § 337), and `Card Drawers`, `Card Examples in Text`, and `Exclusive Symbols` in the index to *Systematic Indexing* (Kaiser 1911, § 664):[17] on the other hand, his indexes to the reports of the Tariff Commission routinely used plural forms for terms for Concretes that could be counted such as, for example, `Freight Rates`, `Malt Kiln Tiles`, `Melting Pots`, `Storage Facilities`, and `Tubes` (Tariff Commission 1904; 1907, Index).[18] Inverted forms of noun phrases, by contrast, were stringently avoided. In the rare cases where it was necessary to specify more closely the meaning of a heading, qualifiers were employed: for example, in the index to *Card System*, `Concrete (Indexing)` and `Country (Indexing)` indicated that these headings referred to Concretes and Countries as indexing terms, while `Department (Firms)` signaled that this term de-

[16] The rules reviewed here do not exhaust Kaiser's (1911) stipulations about the formulation of subject terms: he also discussed more specific issues, such as the treatment of terms that do not easily fit his definition of Concretes or seem to straddle the boundary between terms for Concretes and terms for Processes (§§ 325-326, 329-330), the expression of subdivisions of Countries (§§ 335-337), and the expression of relations between two countries within the framework of a statement (§§ 341-342). Since these are not directly relevant to our theme, we shall not consider them further here.

[17] One can, however find some breaches to the rule in the index to *Card System*, such as `Capital Letters`, `Charging Slips`, and `Five Position Guides` (Kaiser 1908, § 337).

[18] In these indexes, Kaiser evaded the filing problem underlying his theoretical preference for singular forms (see n. 14 above) by having the focal term in plural form precede all terms using its singular form as a noun modifier for other terms: thus, for example, `Tubes` precedes the terms `Tube Strips`, `Tube Syndicate`, `Tube Thread`, and `Tube Works` (Kaiser 1904).

noted departments in business enterprises specifically (Kaiser 1908, § 367).[19] Strictures against the use of prepositions were honored in the breach, for the headings in Kaiser's indexes abound in noun phrases containing such words: for example, the index to *Card System* includes headings such as `Alteration in names`, `Back of cards`, and `File of Office Literature`; the index to *Systematic Indexing* admits headings like `Date of Publication`, `Extension of Statement`, `Principle of Filing`, and `Scheme of Classification` (Kaiser 1911, § 664); and the indexes to the reports of the Tariff Commission contain such headings as `Iron Bounties in Colonies`, `Trade Policy in Foreign Countries`, and `Foreign Competition at Home` (Tariff Commission 1904; 1907, Index).[20] As for terms for Countries, which occur only in the indexes to the Tariff Commission reports, Kaiser used full forms of the conventional names for national states—e.g., `United States of America` and `United Kingdom` – as headings, although, in some indexes, he abbreviated the name if it formed part of another heading—e.g., `Home Prices in U.S.A.` or `Import Prices in U.K.` (Tariff Commission, 1904). Terms for Processes, which could only serve as subdivisions of terms for Concretes or Countries, likewise generally took nominal forms, including gerunds, such as `Alphabeting`, `Filing`, and `Indexing` (Kaiser 1908, § 367; 1911, § 664),[21] and nouns or noun phrases denoting verbal ideas, such as `Duplication`, `Interpretation`, `Reorganisation`, `Systematic Effort`, and `Useless Work` (Kaiser 1911, § 664).[22] In short, the general impression yielded

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[19] In this index, Kaiser occasionally seems to have used a different convention for qualifying a heading, separating it from the heading by a comma instead of enclosing it in parentheses—e.g., `File, Cabinet`, where a comparison of the index term with the text to which it refers (Kaiser 1908, § 10) clearly shows that, despite the form of the heading, the word "cabinet" is meant to specify the meaning of `File`, not to be an inversion of a term *`Cabinet File`. Knight (1979) 19-20 prefers to call such non-parenthesized additions to the heading "modifications" and we shall follow his lead here.

[20] The index to *Systematic Indexing* also includes a number of headings with the form "[X] and [Y]", such as, e.g., `Concrete and Book`, `Fact and Opinion`, and `General and Specific`, or even the form "[X] [Y] and [Z]", such as `Concrete Country and Process` and `Concrete Name and Book` (Kaiser 1911, § 664). This brings into the heading elements (… `and Book`; … `and Opinion`, … `and Specific`) that would normally be treated as subheadings. Modern commentators on book indexing tend to frown on the use of such double- and triple-barreled headings; see, e.g., Wellisch, 1995, 24-28.

[21] Some headings in the indexes to Kaiser's two books took the form of gerundive phrases with nouns as direct objects: e.g., `Handling Quantities` (Kaiser 1908, § 337) and `Consulting the Card Index` (Kaiser 1911, § 664). Insofar as such headings incorporated both a term for a Process (i.e., Handling, Writing) and a term for a Concrete (… `Quantities`, … `cards`, and … `Guides`), they violated a basic assumption of the card index version of SI—namely, that terms should not be categorially ambiguous. Within a card index, such terms would have normally taken the forms in which the term for Process is separated from the term for Concrete and placed in the role of a subdivision, such as *`Quantity—Handling` and *`Card Index—Consulting`,

[22] It should be noted that, on rare occasions, Kaiser (1911) admitted the use of adjectives for Processes, such as `Available` in `Sailing Vessel—Available` (§ 455) or `Undesirable` in `Credit—Gold Coast—Undesirable` (§ 457). For a discussion of the possible motivations for the use of these "adjectival" Process terms, see Dousa 2013, 444-445.

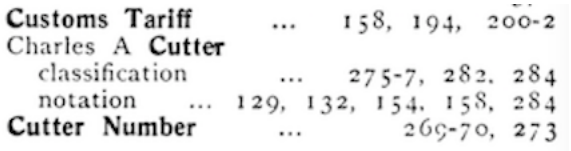
by a survey of Kaiser's book indexes is that he did not consistently apply the rules for term formation in the card index version of SI to the creation of headings for book indexes.

If one compares Kaiser's general rules for the formulation of index terms with currently held norms for the construction of headings for book indexing, a number of points of convergence emerge. Many latter-day authorities share Kaiser's views that headings should take the form of nouns or noun phrases (Browne & Jermey 2007, 59; Mulvany 2005, 79), that the inversion of terms is to be discouraged (Browne & Jermey 2007, 58; Wellisch 1995, 73-76), that headings should be specific in reference (Browne & Jermey 2007, 59; Mulvany 2005, 80-81), that qualifiers should be added to terms to disambiguate them when necessary, especially when questions of homonymy arise (Browne & Jermey 2007, 60; Mulvany 2005, 89; Wellisch 1995, 413), that prepositions are best avoided in headings if possible (Wellisch 1995, 80), and that it can be advantageous to offset headings in an index typographically (Browne & Jermey 2007, 59). There are, however, areas of disagreement as well. In contradistinction to Kaiser's tenet that all index terms for Concretes take the singular form, current writers on book indexing generally espouse the use of the plural form for nouns or noun phrases referring to countable objects (Browne & Jermey 2007, 59; Mulvany 2005, 87; Wellisch 1995, 429-431). Yet, even here, divergence is not total, for, as we saw above, Kaiser did include plural terms among the headings of his indexes: it appears that, in practice, he found the rule regarding singular terms, originally formulated for the card index, not entirely appropriate for the book index

There was, however, one point where Kaiser's rules for constructing headings diverged profoundly from current indexing practice and this is in his formulation of personal name headings. Basing themselves on norms ultimately deriving from Charles A. Cutter's *Rules for a Dictionary Catalog* (Cutter 1904, 32, § 24.a), latter-day authorities on book indexing assume that, in English-language indexes, a personal name heading should, as a rule, be inverted so that the surname of the person, which serves as the element of the name used in determining filing order, occupies the first place in the heading (Browne & Jermey 2007, 63; Mulvany 2005, 86-87; Wellisch 1995, 73-74): thus, for example, most book indexes would give the name of Charles A. Cutter in the form "Cutter, Charles A." Now, as a rule, Kaiser (1911, § 331) did not encourage the use of author entries in a card index but allowed for their inclusion if it is deemed important to collocate pieces of information emanating from a given writer. He agreed with the common opinion that the surname of a person is to serve as the filing element for a personal heading (cf. Kaiser 1908, § 128): however, in consonance with his conviction that the inversion of terms leads to needless confusion, he stipulated that the name is to be entered in direct order. This rule, which Kaiser originally designed for card indexes, carried over into his practice of book indexing: in the index to *Systematic Indexing*, all personal name headings were given in direct order, with the surname set in bolded type to signal its status as filing element, as is illustrated in the case of the heading `Charles A Cutter` in Figure 1 below. To be sure, only a few such entries are to be found in the index. Nevertheless, their presence there both testifies to Kaiser's willingness to follow his principled opposition to inversions to its logical limits and serves

as a sterling example of how the practices of the card index version of SI can carry over into its book index version.

Figure 1: Personal Name Heading for Charles A. Cutter in the Index to *Systematic Indexing*



Source: Kaiser 1911, § 664

3.2. Locators

In general terms, a locator can be characterized as "an indication of that part of a document, or that item in a collection, to which a heading or subheading refers" (AS/NZS 999 section 3.9, cited in Browne & Jermey 2007, 99). Each heading and subheading in an index must have at least one locator and will often have more. In book indexes, the page number is by far the most common means of tracing information within a given text (cf. Wellisch 1995, 277). However, various other units of location can be used for this purpose. Here, the structure of the book plays a determinative role. Some books divide their pages into separate columns or quadrants and, in such cases, column or quadrant identifiers serve as locators (Mulvany 2005, 101-102).[23] Certain kinds of books, such as reference works, often divide their text into numbered paragraphs, with the paragraph number serving as locator, even if the book is otherwise paginated.[24] Similarly, legal texts are frequently articulated into numbered sections, so that the section number takes on the role of locator in the index (Mulvany 2005, 101). Indexers thus have a number of potential locator types at their disposal.

Kaiser (1911, § 586) held that the question of what kind of locator type to use in a book "has a much more important bearing on indexing than would appear on the surface." For him, the choice was clear – "[f]rom the standpoint of access to the information in the text it is obvious that page numbers are much inferior to paragraph numbers …" – and he set forth several arguments to justify this judgment. One was quantitative in nature. Kaiser assumed that most paragraphs will be of shorter length than the bloc of text on a given page:[25] insofar

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[23] Strictly speaking, such locators should be named page-and-column or page-and-quadrant identifiers, since they combine an indication of the page number with the column or quadrant: e.g., "101b" as a column qualifier means "page 101, column b" and as quadrant qualifier means "page 101, quadrant b".

[24] See the examples cited at Dousa 2013, p. 185, n. 226.

[25] The assumption that the text blocs in paragraphs tend to be shorter than the text blocs in pages is, of course, subject to many exceptions, especially in works by authors given to verbosity, and Kaiser (1911, § 588) himself admitted that "[t]he length of … paragraphs will of course vary, it is not measured by the number of lines but by the complete treatment of a given part of a subject from one point of view." In his own writing, Kaiser favored a brisk

as "the larger the area to which a given number refers, the more troublesome the search and the more difficult the access", the paragraph is preferable to the page as a unit of location.[26] Another had to do with the differential intellectual cohesion of the page and the paragraph. The occurrence of text on any page is adventitious and has nothing to do with the intellectual structure of the text: as Kaiser put it, "[b]y paging we only divide the text in so far as we lump together a quantity of words which happen to fall on a page, whether connected or not, whether they belong to one or several sections" (§ 587). By contrast, "[t]he paragraph is a logical subdivision of the text" (§ 588) and so has an internal coherence that the page lacks: as a result, Kaiser averred, "the information is better concentrated" and so allows for more precise location of subjects. A third, more pragmatic reason for preferring paragraphs to pages as units of location is that they expedite the indexing process: "[w]ith page numbers indexing cannot proceed until page proof is available, with paragraph numbers the indexing can be done at any time" (§ 585). Kaiser conceded that, because paragraphs are smaller and intellectually more compact than pages, using the paragraph as a unit of location is likely to lead to longer indexes: however, this potential disadvantage is offset by the fact that "[w]here the text is numbered by paragraphs the index will have a more definite character, it will show better coordination, it will give more access and do it more easily" (§ 588).

Kaiser put his convictions regarding the desirability of paragraph numbers into practice in his own publications. Both *Card System* and *Systematic Indexing* are unpaginated and number their component paragraphs consecutively; their indexes use paragraph numbers as locators (Kaiser 1908, § 5; 1911, § 22). Similarly, the earliest volumes in the series of reports of the Tariff Commission utilize paragraph numbers as their unit of location; in later volumes, though, the numbers cease referring to paragraphs, indicating instead segments of pages in a manner analogous to quadrant identifiers (Dousa 2013, 186, with n. 228). Although Kaiser's deliberate eschewal of all pagination was unusual, his use of paragraph numbers as locators otherwise conformed to the norms of book indexing.

The use and function of locators is one point at which the book index version of SI differs significantly from the card index version of the indexing system. To appreciate this, it is at first necessary to recall briefly the general structure of individual index units in the card index. As noted at the outset of this paper, in a card index, each card bears a single index item consisting of a *statement*, or compound indexing term, and an *amplification* consisting of an *extension* that summarizes the information being indexed, the date to which the information pertains, and bibliographical data relating to the source of the information, as well as a call number (Dousa 2014a, 310-311; 2014b, 162-163). Consider, for example, the image of an index item given in Figure 2 below. Here, the term string `Soda Nitrate—UK—Trade Condition` entered in staggered form across the top of the card constitutes the

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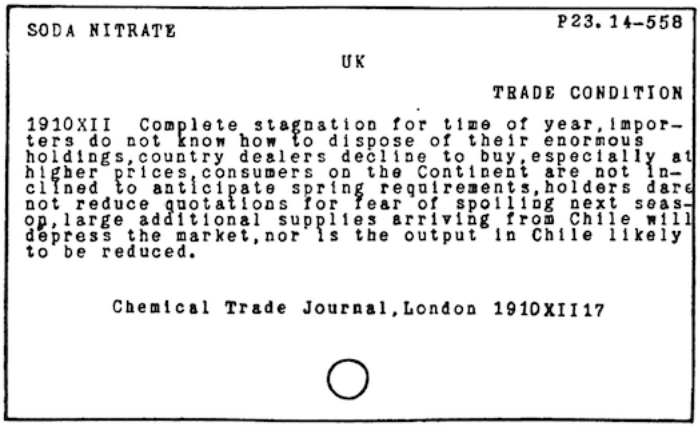
and staccato style of expression (as well as fairly compact typeface), so that paragraphs were invariably shorter than pages in his books.

[26] In fact, Kaiser (1911, § 588) believed that "[t]he paragraph is … generally the measure of minuteness to which the entries [sci., locators—TMD] can go". His belief that the paragraph is the smallest indexable unit in a text is, however, incorrect, for indexes to certain kinds of "densely printed texts" can provide locators for line numbers within pages; see Wellisch 1995, 285.

statement and the items below it form the amplification, which consists of the date to which the information pertains (in this case, "1910XII", i.e., December, 1910), a paragraph comprising the extension or summarization of the information being indexed, and a short citation of the bibliographical source from which the information is drawn. Finally, in the upper righthand corner of the index item is the call number for the bibliographical source in question.

Figure 2: An Index Item in the Card Index Version of SI


SODA NITRATE P23.14-558

UK

TRADE CONDITION

1910XII Complete stagnation for time of year, importers do not know how to dispose of their enormous holdings, country dealers decline to buy, especially at higher prices, consumers on the Continent are not inclined to anticipate spring requirements, holders dare not reduce quotations for fear of spoiling next season, large additional supplies arriving from Chile will depress the market, nor is the output in Chile likely to be reduced.

Chemical Trade Journal, London 1910XII17

Source: Kaiser 1911, § 451

Of the various elements comprising the index item enumerated above, it is the call number that is analogous to the locator of a book index—indeed, so much so that in some passages in *Systematic Indexing*, Kaiser (1911, §§ 591, 595) refers to book index locators as call numbers. And, yet, as the form of the call number in the Figure 2 indicates, locators in the card index version of SI take a form much different from that of the locators in a book index heading. Whereas the latter consist of Arabic numerals referring to paragraph numbers (See Figure 1 above), the former appear under a form in which a capital letter is prefixed to a sequence of numbers and punctuation marks—P23.14-558 in the example above. The complex internal structure of this call number represents the textual location of the piece of information summarized in the extension. To fully understand its import, it is necessary to consider briefly Kaiser's preferred method for the physical organization of documents, or, in his words, "literature" (§ 185).

Unlike many contemporary librarians, Kaiser thoroughly eschewed subject classification as a basis for the physical arrangement of materials in a library, for he considered it to be too complex for use in business and technical libraries (Kaiser 1908, § 74) and inadequate for dealing with polytopical documents (Kaiser 1911, §§ 188, 255-257). His preferred mode of classifying library materials was to organize them by form(at). Documents were thus categorized into broad form classes such as periodicals, correspondence, books,

press clippings, trade catalogs, manuscripts, and so on (Kaiser 1908, § 10; 1911, § 185), with each of these classes subarranged by a form of "numerical classification" (Kaiser 1908, § 74), in which each item belonging to a given class was assigned a number according to its order of accession into the class (cf. Dousa 2013, 222-227; 2014c, 211). The call numbers in the card index version of SI were designed to reflect this flat classificatory structure. The capital letter comprised the initial letter of the name of the document class in question—for example, "P" stood for periodicals, "PC" for press clippings, "T" for trade catalogs, and so on (Kaiser 1908, §§ 10, 75)—while the following number represented the accession number of the document in question, sometimes supplemented by additional information that varied across different classes (§§ 11, 81-83). In the case of the call number in our example above, the characters "P23.14-558" indicate that the information given in the extension of the index item can be found on page 558 of the fourteenth issue of the journal occupying the twenty-third place in the periodical files of the library in question, the title of which, as can be read at the bottom of the card, is *Chemical Trade Journal*. If the person consulting the index were not satisfied with the information presented in the extension, he or she would know, in virtue of this call number, where to find the original text.

The difference in form between this formally complex card index locator and the relatively simple Arabic number-based locators in a book index is not without significance, for it is a reflex of a broader difference between the two forms of indexes. The book index *qua* terminable index deals only with information located within a single document and so its locators refer only to information within that document, whereas the card index *qua* interminable index has to account for information scattered across different (kinds of) documents in a collection (cf. Section 2 above) and so its locators must refer to the documentary sources in which the desired information is to be found. Here one can clearly see how the general differences between terminable and interminable indexes can affect such detailed index features as the forms of locators.

3.3 Subheadings

Modern authorities on book indexing generally agree that subheadings serve two functions within a book index. One of these is quantitative in nature. It is a common principle of indexing that, if, in the preparation of an index, the heading of an entry has an excessively long string of locators associated with it,[27] this string should be broken up by introducing subheadings identifying the particular aspects of the subject under discussion and redistributing some of the locators of the heading to these subheadings (Browne & Jermey 2007, 89; Knight 1979, 104-105; Mulvany 2005, 85, 224). The second function of the subheading is qualitative. In the words of one commentator, "[s]ubheadings help to widen the context of a heading" (Knight 1979, 53) by indicating what aspects of the subject represented

[27] Commentators on indexing typically set the upper limit for the number of locators per heading or subheading at between five and seven. See, e.g., Browne & Jermey 2007, 89 ("no more than five to seven … locators"), Knight 1979, 105 ("five or, at the most, seven (and then rarely))", Mulvany 2005, 85 ("when there are more than five reference locators for a heading, subheadings should be added …"); Wellisch 1995, 279, 281 ("Seven plus or minus two may … be the most sensible limit to the number of locators listed against any single heading …").

by the heading are discussed in the book. Both the reduction of the number of locators for a heading and the specification of the topic allow the user of the index to identify and trace more efficiently the information that he or she seeks in the pages of the book in question.

When we turn to Kaiser, we see that he espoused a form of the quantitative rationale for the use of subheadings, framing it within a more general argument regarding "the force of numbers" (Kaiser 1911, § 27). According to this argument, organization in general

> may be called the science of the simultaneous control of numbers. Organisation whether small or large, is the direct consequence of numbers and the greater the numbers the more need for organisation. Numbers compel us to organise, without some organisation there can be no effective management, no effective control. … The force of numbers is therefore at the bottom of all organisation (§§ 27-28).

Effective organization requires "the control of numbers", which is realized by partitioning them into smaller, more tractable sets of quantities:

> Since a smaller number of can be more easily controlled than a larger one, the aim of organisation obviously is to reduce the numbers to a manageable compass so as to assure adequate control. This is done by dividing the numbers off into groups, departments, classes, etc. (§ 29).

Kaiser did not fail to apply this highly abstract argument – that control over any large group of entities requires subdividing it into smaller groups, each of which contains fewer members and so can be more easily managed –to the book index. He distinguished between "small headings" [sci., small entries—TMD], in which the main index term is associated with only a few locators, and "large headings" [sci., large entries—TMD], in which the index term is associated with many locators, observing that

> [i]n comparing the structure of small and large headings we clearly see again the force of numbers, the only difference between the two is that for the smaller headings there are few call numbers [*sci*., locators—TMD] and for the larger headings there are many call numbers [*sci*., locators—TMD] …" (§ 591).

From this, he drew the conclusion that "the structure of the headings is dependent on the quantity of call numbers [*sci.*, locators—TMD]." Thus, for Kaiser, the primary purpose of subheadings is to break up potentially long series of locators associated with an entry into smaller, visually more manageable series.

To understand the form that subheadings took in the book index version of SI, it is necessary to consider the method by which both headings and subheadings are to be formulated. Kaiser (1911, § 592) recommends that, prior to commencing the work of indexing proper, the indexer read through the text of the book in order to gain a general impression of its contents and the terms that it uses. Then he or she should read through each paragraph separately, identifying the indexable subjects that it contains (§ 597, 1-2). The indexer should take an index card for each subject term that he or she has identified and write on it a sentence, the grammatical subject of which should be the term in question (§§ 592,

597, 3): if a single term has several different ideas associated with it in the paragraph and so could be the subject of several different sentences, a separate card should be made for each (cf. § 604). Each of these sentence-bearing cards constitutes what Kaiser called an "entry" (cf. nn. 8-9, above) and what we shall here term a *unit entry*. Crucially, Kaiser considered the sentence in each unit entry to be directly analogous to the statement found on an index item in a card index (§ 597; cf. Figure 2 above). Just as a statement in an index item indicates the "approximate limits of the information" (§ 304) contained in the amplification about the Concrete or Country that serves as its main term (§§ 302, 304, 662, s.v. "Concrete and Record"), so does the sentence in a unit entry express "a complete idea" (§ 592) about the index term that serves as its grammatical subject. To Kaiser's mind, the primary difference between the two lies in their mode of linguistic expression: the statement in the card index takes the form of a syntactically regimented string of terms consisting of a main term, or heading, and sub-divisions (namely, [Concrete]–[Country]–[Process], [Country]–[Concrete]–[Process], [Concrete]–[Process], or [Country]–[Process]), each element of which is a noun phrase (e.g., `Silk Worm—Cuba—Culture` (§ 506), `France—Claret—Colouring` (§ 529), `Electric Crane—Management` (§ 463), `Italy—Emigration` (§ 467)), while the sentence in the unit entry for the book index is a formulated in natural language.

After the indexer has gone through the text of the book, forming new unit entries for the subjects in each paragraph and arranging the cards by paragraph number, he or she should review the cards, making any adjustments necessary to assure that the terminology used for subjects is consistent (Kaiser, 1911 § 593). As the indexer does so, he or she should also mark out candidate terms for cross-references. Once this first round of review has been completed, each unit entry should be reviewed anew and analyzed to see if there are any terms in the sentence besides the term serving as the grammatical subject that are appropriate for inclusion in the index and if so, unit entries should be made for them as well. Kaiser called this stage of the process "duplicating" (§§ 594, 603): notably, he considered it an opportune time to identify terms for Processes that should serve as headings in the index (§§ 594, g; 597, 4). The admission of terms for Processes to the status of headings marks a significant point of departure from the procedure for creating a card index, for, as we have seen, in such an index, only a term for a Concrete or a Country can serve as the first, or main, term of a statement, which is the functional equivalent of a heading (cf. Section 3.1 above). When this phase of the indexing process has been completed, the cards, which had previously been organized in the numerical order of paragraph numbers, should be rearranged alphabetically by the terms that will serve as headings (§§ 594, g; 597, 56).

Once the cards bearing the unit entries have been filed into alphabetical order, the process of indexing enters the phase of "condensing", during which the indexer is to "condense them [sci., the cards—TMD], to reduce the volume, and also to class them more compactly, more systematically" (Kaiser 1911, § 595). This process involves first "survey[ing] the cards generally to obtain an improvised picture of the finished index" and to identify headings possessing numerous locators for which multiple subdivisions will be necessary (§§ 595, h; 597, 7): at this point, Kaiser recommended that the indexer make notes about these large headings and sketch out ideas about what subdivisions to use for them. Next

comes the process of condensation proper. The indexer should take the unit entries for each heading and consider them in light of both the information about the heading that they contain and the number of unit entries per heading. For headings that have only a few unit entries associated with them, the indexer may choose to consolidate them into a singleton heading—i.e., a heading without any subdivisions—or into a heading with a small number of "subdivisions", as Kaiser called subheadings (§ 604). For his part, Kaiser considered singleton headings to represent statements that had been "reduced to one term"—a feature of the book index that "would be quite inadmissible in a card index" (§ 576). Entries possessing a larger number of unit entries can either be consolidated into a heading with few subheadings or expanded into one with a number of subheadings: in such cases, both the length of the index and the relevance of the contents of the unit entries are factors that will lead to a decision whether to expand or contract the entry (§§ 606-607). In all these cases, the heading and subdivisions, if any, are recorded anew on a single card – what Kaiser called the "condense card" – together with their locators and any formatting specifications (§§ 595, i; 597, 10-13).

Headings with very large numbers of unit entries are, according to Kaiser (1911, § 613), "the most troublesome to manage" and require special care on the part of the indexer. Such headings may require not only subdivisions but even secondary or tertiary subdivisions of subdivisions, though, as Kaiser cautioned, these should not be needlessly multiplied on the grounds that "too many subdivisions will confuse rather than help" and that "[t]oo minute subdivisions of very large headings will only help to bury the information" (§ 613; cf. §619). In such cases, what is needed is a consistent structuring of large headings referring to comparable kinds of subjects (§ 596), for "[t]he larger the headings the greater the necessity to manage the subdivisions systematically so that from a simple and clear plan of the subdivisions it is sufficiently evident where particular information must be looked for" (§ 613). That is why Kaiser recommended sketching out ideas about what subdivisions might be necessary during the first phase of the condensing process. His recommendations for the treatment of large headings for Countries offers a good example of what a coordinated structure for large headings might look like. For such headings, he advised separating out subdivisions involving terms for Processes from those involving terms from Concretes and listing them as two separate series of subdivisions, visually distinguished from one another in the final form of the index by varying depth of indentation (§§ 614-615). If consistently carried out across all large headings for Countries, such a simple separation of different kinds of subdivisions can endow the ending with a clear and predictable structure that can facilitate search. At any rate, large headings and their subdivisions are also to be recorded on condense cards and incorporated into the final, alphabetically organized set of cards, which, once they have been sequentially marked with a number, are ready to be sent for the printer to be made up into galley proofs (§ 597, 14-16).

Such, then, are the main lines of the process of preparing a book index according to the tenets of SI. The resulting index will have entries of different proportions, ranging from singleton entries with no subdivisions to medium-sized entries with a few subdivisions to large entries containing numerous subdivisions that may require some measure of classi-

fication. Here it will be instructive to examine a few examples from the indexes that Kaiser prepared for his own books and for the reports of the Tariff Commission in order to see how the subdivisions in the book index form of SI appear in practice.

As regards layout, the entries of Kaiser's indexes rendered the heading in a visually distinct typeface, either boldface (in *Systematic Indexing*), capital letters (in the reports of the Tax Commission), or both (in *Card Index*) (cf. Section 3.1 above), while the subheadings were generally disposed on individual, indented lines beneath it—what indexers today call the indented style (Browne & Jermey 2007, 94; Mulvany 2005, 193; Wellisch 1995, 142-145). Figure 3 offers an example of one of the larger entries from the index to *Systematic Indexing*:

Figure 3: Entry for `Indexing` in *Systematic Indexing*

Indexing—*see also* ABSOLUTE-, DISCRIMINATION, SYSTEMATIC- 10 et seq, 389, 580
by process terms ... 344, 446, 653-4
definition 295, 571
examples 307, 448 et seq, 598 et seq
from various standpoints ... 454, 460
function of intelligence department 50-1
individual for each business 91, 309, 454
is necessary 5, 15, 97
method 10-5, 295 et seq, 447 et seq
must concentrate on specific 74, 85
presupposes knowledge ... 97, 592
selects and rejects 45-6, 50, 83, 309, 646
takes literature to pieces ... 16, 48

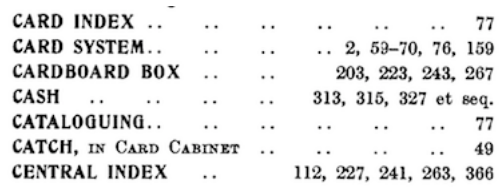
Source: Kaiser 1911, § 664

In this example, the heading `Indexing` is immediately followed by a series of cross-references, an element of the entry we shall consider in Section 3.4 below. Of greater relevance here are the ten subheadings that are listed in alphabetical order below it, each of which represents a unit entry that has survived the process of condensing. A feature that promptly strikes the eye is the variety of linguistic forms that these subheadings take. Some of them are nouns or noun phrases (i.e., `definition`, `examples`, `method`, `function of intelligence department`), others take the form of prepositional phrases (i.e., `by process terms`, `from various standpoints`), one is formulated as an adjectival phrase (i.e., `individual for each business`), and the remainder are verbal phrases (i.e., `is necessary`, `must concentrate on specific`, `presupposes knowledge`, `selects and rejects`, and `takes literature to pieces`). The grammatical heterogeneity of these subheadings reflects the different degrees of condensation of the full sentences that constituted the original unit entries for these subheadings, with the nominal

forms representing the greatest amount of reduction and the verbal phrases, the least. The resultant diversity of linguistic form contrasts sharply with the formal consistency of terms serving as subdivisions in the statements of card indexes, which, as noted earlier, typically take the form of a noun or noun phrase (see Section 3.1, above). This, then, constitutes a palpable point of difference between the book index and the card index versions of SI. Another significant feature of this entry is the categorial status of its heading. `Indexing` is manifestly a Process term and yet all of its subdivisions, with the exception of `examples` and `method`, are either Process terms or, at the very least, Process-like in semantic content (i.e., `definition` and all of the verbal and adjectival phrase subdivisions), or fall outside the categorial scheme of SI altogether (i.e., the prepositional phrase subdivisions, which are, in fact, adverbial modifiers of the verbal-noun heading). Here, then, the syntactic rules of the card index version of SI have largely broken down.

The foregoing example represents an entry of medium size. When we turn to smaller entries, several different patterns emerge. The simplest of these is the singleton heading consisting of a single noun or noun phrase, such as the examples from the index to *Card Index* in Figure 4:

Figure 4: Singleton Terms in *Card Index*



Source: Kaiser 1908, § 367

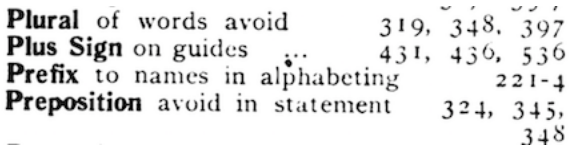
For Kaiser, such headings represent highly abbreviated forms of statements (Kaiser 1911, § 577), in which any potential matter for subdivision in the unit entries from which they were formed has been eliminated because it has been deemed unnecessary for the purposes of the index. The only heading in this series that deviates from this norm is `Catch, in Card Cabinet`, in which the prepositional phrase "in Card Cabinet" modifies the noun "Catch".[28] In this case, the formal status of the modifying phrase could be interpreted in two ways. On one hand, it could be seen as a modification of the main heading that has been supplied to set it in context and make its meaning more precise (Knight 1979, 19-20, 45): on this view, it functions much as a qualifier does (cf. n. 18 above). Alternatively, it could be viewed as a subheading that has been telescoped into the main entry. The first possibility would accord better with the modern canons of indexing, which frown upon the construction of entries consisting of a heading and a single subheading (Mulvany 2005, 225). However, it is difficult to draw a firm dividing line between modifications and subheadings—indeed, as one

[28] In this context, the "catch" refers to a device used to fasten cabinet drawers to a card cabinet and so ensure that they cannot be fully pulled out; see Kaiser 1908, § 49.

commentator has noted, "[i]n a sense subheadings may be regarded as modifications" (Knight 1979, 19-20)—and so either interpretation is possible here, though the presence of the modifying phrase on the same line as the heading proper and its close syntactic relationship to the latter might incline one to understand this phrase as an example of a qualifier rather than a subheading.

Likewise ambiguous are comparable entries from the index to *Systematic Indexing* illustrated in Figure 5 below:

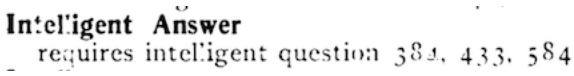
Figure 5: Singleton Entries with Modifications in *Systematic Indexing*



Source: Kaiser 1911, § 667

Here, two of the entries, `Plus Sign on guides` and `Prefix to names in alphabeting` are formulated in a manner similar to that of `Catches, in Card Cabinet` in that the heading is modified by a prepositional phrase: again, it is tempting to see the prepositional phrase as a kind of qualifier of the heading. In the two other entries, however, one encounters forms of verbal phrases. The wording of the entry `Preposition avoid in statement` is best understood as a command to avoid prepositions in statements: the modifier `avoid in statement` thus constitutes an imperative clause that has been placed after the heading `Preposition`. In the other entry, `Plural of words avoid`, the grammatical structure is even more entangled, for the phrase `of words` is a prepositional phrase modifying the heading `Plural`, while the final word in the entry is again, an imperative form of the verb `avoid`. In cases such as these, it is much more difficult to interpret the modifying words as qualifiers alone, for they express complete, sentence-level ideas and so seem to function more like telescoped subheadings than as simple qualifiers. This impression is strengthened by the entry shown in Figure 6, in which the modifying words are not only formulated as a verbal phrase (i.e., `requires intelligent question`) but also are presented on a line below the heading proper, with indentation, just as one would expect for subheadings:

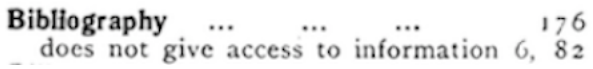
Figure 6: Singleton Entry with Verb Modifier in *Systematic Indexing*



Source: Kaiser 1911, § 667

One could understand this entry as an example of a heading followed by single subheading. And yet, in this case, the interpreter must exercise caution, for, given that the heading proper lacks a locator, it is possible—even if implausible—that the long verbal phrase was intended to serve as a qualifying phrase, but had to be moved to a separate line because of its length. No such ambiguity hedges the example given in Figure 7, for here the heading proper, `Bibliography`, has its own locator, as does the verbal phrase `does not give access to information` under it:

Figure 7: Heading with Single Subheading in *Systematic Indexing*



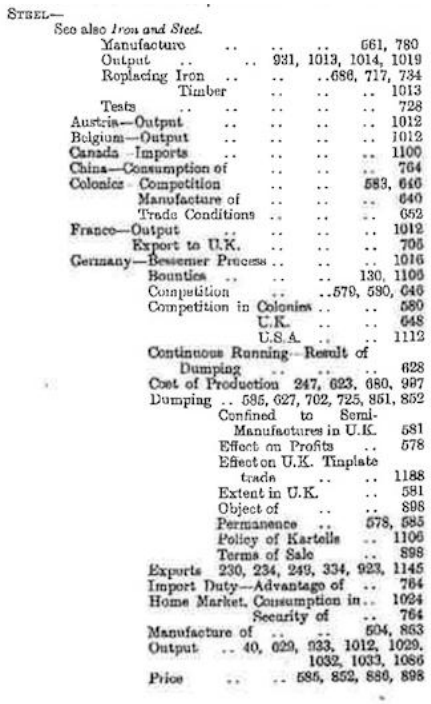
Source: Kaiser 1911, §667

Here, then, is a clear example of an entry consisting of a heading and a single subheading. Most modern indexers would consolidate this entry into a single heading `Bibliography` and associate all three locators directly with it (Mulvany 2005, 225); however, Kaiser evidently considered the informational content of the subheading sufficiently valuable to retain it. At any rate, many entries in the index to *Systematic Indexing* followed the pattern of singleton heading with modifier or heading with a single subheading, telescoped or otherwise, and this can be considered a distinctive element in Kaiser's treatment of smaller entries in the book index.

We have seen that small entries in Kaiser's book indexes typically had minimal and formally somewhat unstructured subheadings. Large entries, on the other hand, displayed a greater degree of regimentation in their inner structure. Consider, for example, the beginning of the entry for the heading `Steel` in the index to the Tariff Commission's report on the iron and steel trade, which is illustrated in Figure 8 below. After a brief cross-reference, this heading begins with a series of five subheadings which are indented more deeply than those that follow. These subheadings—namely, `Manufacture`, `Output`, `Replacing Iron`, `Replacing Timber`, and `Tests`— are all terms for Processes that are subdividing a term for a Concrete. Three of these subheadings take the form of a noun, while the other two (i.e., `Replacing Iron, Replacing Timber`) take the form of a gerundive with a noun object. The nominal subdivisions can be directly transposed into statements used in the card index version of SI that follow the bipartite [Concrete]–[Process] template (to wit, `Steel—Manufacture`, `Steel—Output`, and `Steel—Tests`, respectively), though the gerundive-phrasal ones cannot. Following these four subheadings formed from Process terms comes a series of more shallowly indented subheadings with terms for Countries: `Austria`, `Belgium`, `Canada`, and so on, each of which is further subdivided by a Process term, thus following the tripartite [Concrete]–[Country]–[Process] pattern for statements. Here, again, it is easy to form card index statements such as `Steel—Austria—Output`, `Steel—Canada—`

Imports, or Steel—Germany—Bessemer Process. The subheading for Germany, however, includes a further level of subdivision under its Process subheading Dumping,[29] many of which are complex phrases (e.g., Confined to Semi-Manufactures in U.K., Effect on U.K. Tinplate Trade, and Extent in U.K.) that are difficult to fit neatly into the categorial schema of SI. This set of unruly sub-sub-subheadings, which flout SI's rules for the formulation of terms and remind one of the grammatically polymorphous subheadings in Figure 3 above, marks the limit of subdivision in the entry.

Figure 8: Beginning of Heading for Steel in the Index to
The Tariff Commission's Report on the Iron and Steel Trades



STEEL—
See also *Iron and Steel.*
Manufacture 661, 780
Output 931, 1013, 1014, 1019
Replacing Iron 686, 717, 734
Timber 1013
Tests 728
Austria—Output 1012
Belgium—Output 1012
Canada—Imports 1100
China—Consumption of 764
Colonies—Competition 583, 646
Manufacture of 640
Trade Conditions 652
France—Output 1012
Export to U.K. 706
Germany—Bessemer Process 1016
Bounties 130, 1106
Competition 579, 590, 646
Competition in Colonies 580
U.K. 648
U.S.A. 1112
Continuous Running—Result of Dumping 628
Cost of Production 247, 623, 680, 997
Dumping .. 585, 627, 702, 725, 851, 852
Confined to Semi-Manufactures in U.K. 581
Effect on Profits .. 578
Effect on U.K. Tinplate trade 1188
Extent in U.K. .. 581
Object of 898
Permanence .. 578, 585
Policy of Kartells .. 1106
Terms of Sale .. 898
Exports 230, 234, 249, 334, 923, 1145
Import Duty—Advantage of .. 764
Home Market, Consumption in .. 1024
Security of .. 764
Manufacture of 504, 863
Output .. 40, 629, 933, 1012, 1029, 1032, 1033, 1086
Price 585, 852, 886, 898

Source: Tariff Commission, 1904

Despite the messiness in the furthest reaches of its subdivisions, the entry for Steel described above is, on the whole, remarkably orderly and admirably detailed in its structure.

[29] "Dumping" is term of art in international trade referring to the "[s]elling [of] goods in a foreign country at a price which local producers regard as unfairly low" (Black 1997, 133): this was a phenomenon of great concern to the Tariff Commission and so was frequently thematized in its reports (Dousa 2013, 148, 501).

The distinction between the series of Process subheadings and the following series of Country subdivisions introduces an element of classification into the framework of the heading that would doubtless draw objections from many modern authorities on book indexing (e.g., Wellisch 1995, 70): nevertheless, it serves to neatly distinguish between paragraphs of the Tariff Commission's report that deal with processes of steel manufacture and commerce in general and those that deal with steel only in relation to particular countries. For Kaiser (1911, § 618), the great advantage of such a category-based arrangement—which can, of course, be extended to headings featuring terms for Processes or terms for Countries—is the systematic structuring of large entries that it allows:

> where we have to deal with terms of concretes, countries and processes the subdivision of the entries is quite straightforward, any of the three terms may be subdivided by either or both of the other two, and in this manner very large headings can be dealt with systematically so that access to the information they contain is as nearly as possible direct, and the longest heading can be surveyed without difficulty.

What is more, as we have seen, when the heading `Steel` and its subheadings are viewed as strings of subject terms, they neatly recapitulate the structure of statements, whether bipartite or tripartite in form, used in the card index version of SI. Here, then, we find justification for Kaiser's claims that the larger entries in book indexes "ultimately retain the complete form of the statement" (§ 577) and that they "show all the card features [sci., all the features of statements in the card index—TMD]" (§ 591), whereas smaller headings do not. Indeed, it is in the inner structure of large entries in Kaiser's indexes to the Tariff Commission's reports that the card index and book index versions of SI converge most visibly.

3.4. Cross-references

Kaiser (1911, § 414) considered cross-references to be a crucial element in the constitution of an alphabetically organized card index, for they have the function of "bringing together related terms somewhat in the manner of a logical classification" and so "complete the structure of the card index."[30] According to the protocols that he established, they are to be made only between the terms occupying the first position in statements, or main terms, which, as we have repeatedly seen, can only be terms for Concretes or Countries (See Sections 1, 3.1, & 3.3 above): in this way, "[c]oncretes are connected with concretes, countries are connected with countries, so far as they bear any relation to each other" (§ 416). Kaiser envisioned four different kinds of cross-references: (1) references from a broader term, or "collective", to the various "specifics", or narrower terms, that stand in a hierarchical relationship to it; (2) references from a "specific", or narrower term, to all the "collectives", or broader terms, under which it falls; (3) references between two terms that are related in a non-hierarchical sense; and (4) references between synonymous terms (§ 423).[31] All four kinds of cross-references are applicable to terms for Concretes, while terms for Countries

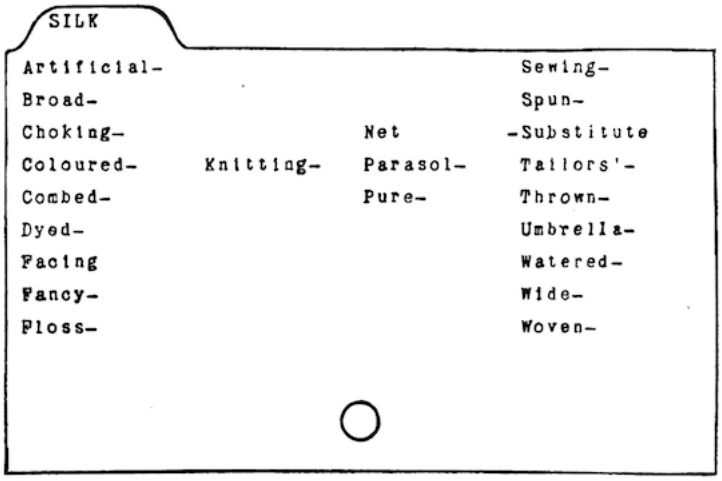
[30] For a fuller discussion of Kaiser's rationale for cross-references in the card index, see Dousa 2013, 602-606.

[31] For more detail on how Kaiser envisioned these four kinds of cross-references, see Dousa 2013, 610-625.

only require references from broader terms to narrower terms or from narrower terms to broader terms (§§ 420-422).

As regards practical implementation, the cross-references for a given term are to be entered in alphabetical order on the guide card that signposts its location within the files of the card index, as is illustrated in Figure 9:

Figure 9: Guide card for the main term `Silk`



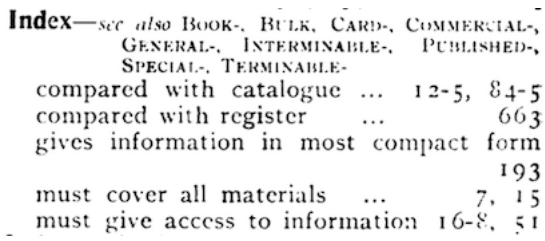
Source: Kaiser 1911, § 538

Here, the main term is `Silk`, which denotes a Concrete. Two formal features of the cross-reference terms on the card are especially worth noting. First, cross-references to terms that include the word from which reference is made are indicated by a dash in the cross-reference term: for example, `Artificial-` means "`Artificial Silk`", `-Substitute` stands for "`Silk Substitute`", and so on. Second, there is no formal indication of what kind of relation obtains between the main term `Silk` and its related terms. Certainly, one can infer these relationships from the linguistic forms of the related terms: for example, all the cross-references taking the form `[Adjective] Silk` are narrower terms to the broader term `Silk`, while the term `Silk Substitute`, in which `Silk` takes on an adjectival role, represents an associatively related term. However, no attempt is made to distinguish the different classes of cross-referential relationships from one another visually.[32]

[32] It should be noted that in a brief exposition of SI published some fifteen years after *Systematic Indexing*, Kaiser (1926, 24, § 14) did introduce symbols to differentiate these relationships on the guide cared, using the signs ">" to indicate narrower terms; "<", broader terms; and "=", synonyms. However, this innovation well postdated Kaiser's exposition of his method for creating book indexes and so did not have any influence on his method of book indexing.

Many of the protocols that Kaiser laid out for cross-references in the card index were carried over into the book index as well. Consider the example in Figure 10, which gives the entry for `Index` in *Systematic Indexing*:

Figure 10: Entry for `Index` in *Systematic Indexing*



Index—*see also* BOOK-, BULK, CARD-, COMMERCIAL-, GENERAL-, INTERMINABLE-, PUBLISHED-, SPECIAL-, TERMINABLE-
compared with catalogue ... 12-5, 84-5
compared with register ... 663
gives information in most compact form 193
must cover all materials ... 7, 15
must give access to information 16-8, 51

Source: Kaiser 1911, § 667

In this entry, the cross-references immediately follow the heading. This choice of placement is not trivial, for it recapitulates the positioning of cross-references on the guide card in the card index, which stands at the head of the series of cards bearing index items related to the main heading in question.[33] Prefixed by the phrase "see also", the cross-references are enumerated in alphabetical order, as on the guide card. They also preserve the convention of indicating the presence of the heading word `Index` in the terms to which reference is made: hence `Book-` means "`Book Index`", `Interminable-` stands for `Interminable Index`, and so on.[34] It is readily apparent that, with the exception of `Bulk`, which leads to the heading `Bulk of Index` and so represents an abbreviated form of a term standing in an associative relationship to `Index`, the cross-references are to narrower terms indicating different species, so to speak, of the genus `Index`. In light of these similarities in the presentation of cross-references in card and book indexes, Kaiser (1911, § 590) was surely justified in stating that "[i]n the card index we collected the related terms on the guides. In the book index we have no guides, but the related terms are managed much in the same way, by means of references."

Although Kaiser adopted many of the features of card index conventions for cross-references into his guidelines for creating book indexes, the latter were not wholesale transpositions of the former. He fully recognized that, in a book index, cross-references create

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[33] Modern authorities on book indexing allow for the placement of cross-references at either the beginning or at the end of an entry; see Brown & Jermey 2007, 98; Mulvany 2005, 199. Thus, Kaiser's location of the headings at the beginning of the entry represents a deliberate choice on his part, not merely adherence to convention.

[34] Kaiser follows this convention in his indexes to *Systematic indexing* and the reports of the Tariff Commission (e.g., Tariff Commission 1904, 1907, index). However, in the index to *Card Index*, the dash does not appear but only the adjectival phrase modifying the (implied) term: see, e.g., the heading `Guide`, which has the cross-references `Fifth`, `First`, `Five`, `Fourth`, `Index`, `Lateral`, `Printed`, `Second`, `Tab`, `Third`, and `Vertical`, all of which are to be read as "`Fifth Guide`", "`First Guide`", and so on (Kaiser 1908, § 367). The addition of the dash in the later indexes, which appears to have been conditioned by its use in the card index version of SI, marked a clear improvement in the presentation of such related terms.

a useful series of "ramifications" that allow a reader to navigate the index in search of information (Kaiser 1911, § 610): however, he also saw the need for greater restraint and circumspection in their use than in a card index. For him, "the guiding principle" for cross-references is that "no reference from one term to another is made unless that second term gives information not contained under the first term" (§ 609). Thus, for example, if, in a book on fabrics, say, the locators under the entry on `Coloured Silk` also occur among the locators under `Silk` in general, then there is no need to include the term `Coloured Silk` among the cross-references enumerated under `Silk`, for referring from `Silk` to `Coloured Silk` wouldn't lead to any new places in the text that might contain information not already accounted for in the locators under the former term. Kaiser also suggested that a book index does not need to incorporate as many different kinds of cross-references as a card index does:

> With cards we refer from the collective [i.e., broader terms—TMD] to the specific [i.e., narrower terms—TMD] and from the specific to the collective, in the book index it is probably sufficient in most cases to refer from the specific to the collective only, entries being made under the terms as we find them in the text, whether specific or collective (§ 590).

In fact, Kaiser's own indexes tend to follow a pattern opposite to the one that he describes here: broader terms generally include cross-references to narrower terms, while narrower terms do not, as a rule, contain any cross-references at all.[35] At any rate, the advice to restrict (kinds of) cross-references is fully consonant with his belief that the size of the index should govern the frequency of headings: "the more the book index is limited in extent, the more these references [sci., cross-references—TMD] can be cut down, for the index can always be scanned without much trouble if the references prove to be inadequate" (§ 590). For his part, Kaiser exercised restraint in using cross-references within the book indexes that he created, thus following his own maxim that "references, like cards and entries must be kept down, we must get the maximum of work out of the minimum number" (§ 609). Ultimately, the force of numbers governed the degree of inclusion of references in a book index no less than they determined the quantity of subheadings within an entry (cf. Section 3.3 above)

4. Categories and File Structure in the Card and Book Index Versions of SI

Having reviewed the four elements of the book index entry, we turn now to consider briefly the general arrangement of entries within the index. The general principle of organization is that entries are to be arranged according to the alphabetical position of their heading within the sequence of headings in the index. Kaiser (1911, § 214) identified two

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[35] This pattern is evident throughout the index to *Systematic Indexing*. For example, the broader terms `Indexing` and `Index`, illustrated in Figures 3 and 9 above, contain cross-references to series of narrower terms; in neither case, does any of the narrower terms enumerated among these cross-references contain a cross-reference to the broader term. Occasionally, though, a reference from a narrower term to a broader term does occur in the indexes to the reports of the Tariff Commission: for example, in the index to the report on the iron and steel trades, the heading with qualification `Accounting of Syndicates in Germany` contains a cross reference to the broader term `Finance`, which, in turn, contains a reciprocal cross-reference to `Accounting` (Tariff Commission, 1904).

distinct modes of alphabetical arrangement: *absolute alphabeting*, which follows the sequence of letters in a heading without any regard for word boundaries, and *alphabetico-classed* arrangement, which takes word boundaries into account. Of these two options, which correspond to the modern notions of letter-by-letter and word-by-word alphabetization, respectively (Browne & Jermey 2007, 104-105; Mulvany 2005, 116-117; Wellisch 1995, 13-19), Kaiser (1911, § 217) preferred the alphabetico-classed approach on the grounds that "it is easier to arrange and easier to consult and by reason of the first words forming classes give a better perspective view over the material as a whole, and generally it costs less labour."[36] The headings of the book indexes that he created are thus alphabetized in word-by-word fashion, as were the subheadings under each heading, as can be seen in the examples from *Systematic Indexing* in Figures 3 and 9 above.[37] Large entries, however, can be alphabetico-classed in an even more robust sense (§ 571). As we have seen in the entry from the Tariff Commission's report on iron and steel illustrated in Figure 8 above, subheadings for a heading naming a Concrete can be divided into two different series based on the category of term—Process or Country—to which the subheading belongs, with the series of terms for Processes preceding that for terms for Countries. This, of course, constitutes a classified order. Nevertheless, the individual subentries within each series are enumerated in alphabetical order, as are any further sub-subdivisions. The file structure of Kaiser's book indexes can thus be characterized as essentially alphabetical, with occasional uses of category-based classified order in larger headings.

A similar file structure obtains in Kaiser's (1911, §§ 390, 393) prescriptions for the organization of a card index. He stipulates that all cards must be arranged in alphabetical order, beginning with the first term of the statement, which is, of course, the card index analogue of the heading in the book index. As has been noted numerous times, this term will always be a term for a Concrete or a term for a Country. If multiple cards have the same first term, then they are subarranged by the alphabetical order of the second term in the statement and, by the same token, if there are multiple cards with identical first and second terms in the statements, they are further subarranged by the alphabetical order of the third terms in the statements.[38] On this plan, cards with bipartite statements of the form [Concrete]–[Process]

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[36] In speaking of "first words forming classes", Kaiser had in mind adjectives or adjectivally used nouns that, in the absence of any inversions, would allow the terms containing them to collocate together and thus form a class of sorts: for example, terms like `Gold Bars`, `Gold Chains`, `Gold Plate`, and `Gold Watches` would all fall under the terms beginning with `Gold` and so constitute a class of materials made of gold or, again `Artificial Amber`, `Artificial Flavor`, `Artificial Gum`, `Artificial Pearl`, and `Artificial Silk` would all fall under the class of artificial things, and so on; cf. Kaiser 1911, § 215.

[37] It should be noted that, in subheadings beginning with prepositions, Kaiser always treated the initial preposition as an element of filing order, whereas many indexers would exclude them and file the entry by the first noun or noun phrase occurring in subheading. For discussions of the different options for treating initial prepositions in alphabetical filing, see Browne & Jermey 2007, 91-93; Mulvany 2005, 92, 122-123; Wellisch 1995, 389-391.

[38] If there are any cards that have identical statements, they are further subdivided by elements in the amplification, such as the date of information or the date of publication, which are filed in reverse chronological order (Kaiser 1911, §§ 393-394). For further discussion, see Dousa 2013, 580-581.

or [Country]–[Process] always have precedence over cards with tripartite statements of the form [Concrete]–[Country]–[Process] or [Country]–[Concrete]–[Process] (cf. §§ 394-395, 407)—that is to say, a main term for a Concrete is always to be subdivided first by terms for Processes and then by terms for Countries. This, of course, is a pattern identical to that for the construction of large entries in the book index, for, as we have just seen, in the case of headings representing terms for Concretes, subheadings with terms for Processes precede those with terms for Countries (See Section 3.3 above, esp. the discussion of the example in Figure 8).[39] Yet again, it is evident that it is the large headings in a book index that possess the greatest structural similarity to their counterparts in the card index.

As regards alphabetization, then, the book index and card index versions of SI follow essentially the same mode of arrangement. However, they differ in one fundamental aspect of their file structure—the categories of terms that can be used as primary filing terms in the index. As has already been repeatedly pointed out above, Kaiser (1911, § 313, 390) firmly insisted that only a term for a Concrete or a Country can be the first term in a statement and so serve as the primary term for filing in the card index: terms for Processes, on the other hand, must always be deployed as subdivisions of terms for Concretes or Countries (§ 648). By contrast, he considered it permissible to use terms for Processes as headings in a book index, alongside those for Concretes and those for Countries (§ 600). The primary filing terms in a book index thus have a more variegated categorial profile than that of their analogues in the card index.

One may well wonder why, in the context of the book index, Kaiser chose to relax the restriction on the use of terms for Processes as primary filing terms. To answer this question, it is necessary to inquire into his reasons for setting the restriction for the card index version of SI in the first place. At different points in his writings, Kaiser gave various justifications for confining terms for Processes to the role of subdivisions in statements. Some lines of argument were decidedly philosophical in character. Kaiser (1911, § 574) claimed ontological warrant for the restriction: as he put it, "we have given concretes and countries precedence over processes, for in concretes and countries we have something more definite to deal with; processes are dependent on concretes, nor are they tied to any one in particular" (Kaiser 1911, § 574).[40] He also set forth an epistemological rationale: Concretes are the primary objects of human knowledge and the Processes in which they are implicated are the means through which we come to know them (§§ 53-55).[41] Theoretically appealing as such arguments may be, they were not the prime mover for the limitation that Kaiser placed on terms for Processes, which was rooted in much more practical considerations and, indeed,

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[39] The same holds true for headings naming terms for Countries: there, subheadings with terms for Processes precede those with terms for Concretes: see Kaiser 1911, § 614, Pattern III.

[40] For fuller discussion of this argument, see Dousa 2011, 167; 2013, 300-301, 479-480.

[41] Of a piece with this argument was Kaiser's assumption that the users of an index would tend to be interested in information involving Concretes and Countries rather than information limited to Processes alone (cf. Kaiser 1911, § 384).

served as the essential premise for SI's partition of subject terms into categories in the first place.

For Kaiser (Kaiser 1911, §§ 649, 652), an indexing system that does not divide its subject terms into categories and allows any term whatsoever to function as a primary filing term without further subdivision operates on what he called the "catchword method". Such a mode of indexing, in his opinion, has two major flaws. On one hand, the selection of terms for use in a catchword index tends to be arbitrary and hence its stock of terms is unpredictable: without any predictable patterning of terms, it is easy to lose track, over time, of the terminology in the index and this makes it difficult to use its headings to search for the information that one seeks. On the other, a catchword index leads to an immense amount of duplication in the preparation of index items: for example, if one is dealing with a text containing information about the export of hairbrushes to Costa Rica, one would have to enter the same information under the catchwords `Export`, `Hairbrushes`, and `Costa Rica` and this would necessitate the making of a card for each of these entries (Kaiser 1911, §§ 184, 649; 1926, 22, §§ 6-7). Here, again the force of numbers comes into play. In a relatively small card index, such duplication might be tolerable. However, as the size of the index grows, it would lead to an inefficient outlay of the indexer's efforts and an unacceptable hypertrophy in the number of cards incorporated into the index, thus making it even more difficult for users to find the information for which they are searching.

Now Kaiser firmly believed that partitioning the index terms into categories of Concretes, Countries, and Processes and limiting the use of the latter to subdivisions remedies all the deficiencies of the catchword index. On one hand, he argued, it introduces a predictable structure to the organization of the index file that will make it easier for those consulting the index to find what they are looking for (Kaiser 1911, § 653). On the other, it eliminates the duplication of entries, thus saving the time and the effort of the indexer and cutting down the size of the index file (Kaiser 1926, 22, § 7). To be sure, Kaiser acknowledged that, in certain contexts, it may prove necessary to index by Process terms: in such cases, he recommended keeping lists of the Process terms serving as main terms or, better yet, creating specially colored guide cards for them containing cross-references to all the terms for Concretes under which they serve as subdivisions (Kaiser 1911, §§ 654-655).[42] Nevertheless, he far preferred that indexers restrict the use of terms for Processes to subdivisions of terms for Concretes or Countries, averring that "by this method the number of cards is reduced to the minimum and … the efficiency of the index is increased to an extent which is quite impossible with mixtures of concrete and process terms" (§ 648).

For Kaiser, the underlying rationale for limiting terms for Processes to the role of subdivisions in the card index is ultimately linked to the interminable nature of this kind of index. His worries about loss of terminological control and profusion in the quantity of cards were predicated upon the fact that a card index is an open-ended index that is liable to increase

[42] Later implementations of SI by special libraries in the United Kingdom did, in fact, involve indexing by Processes: the general strategy was to have a separate "Process section", in which a restricted number of Process terms received a very lightweight form of indexing. See Barbour, 1921, 175-176; Barbour and Withers in Kaiser, 1926, 39 & 43.

over time (see Section 2 above). To his mind, the syntactic limitations imposed upon the use of terms for Processes are a means of asserting some control over an unpredictably growing index and assuring that its inevitable growth is moderated as efficiently as possible. Such conditions, of course, do not apply in the case of a book index, which, as a terminable index, is inherently bounded in its scope and not liable to growth. It is for this reason that Kaiser felt free to loosen the syntactic restrictions on terms for Process in the book index: as he observed, "[i]n a book index there is less objection to entries under process terms, because with a limited quantity of material there is less danger of hiding information under process entries, than in the case of the card index" (Kaiser, 1911, § 600). For him, strict adherence to the syntactic rules of SI in the card index is ultimately a means of achieving "the control of numbers" (see Section 3.3, above) in an interminable card index: the boundedness of a book index *qua* terminable index, however, is in itself a form of such control and so allows for some relaxation of the rules.

5. Concluding Observations

In the foregoing pages, we have passed in review and analyzed the primary features of Kaiser's adaptation of his subject indexing system to the book index. We began by observing that, as Kaiser saw it, the book index constitutes a kind of index quite different from the card index, for which SI had originally been designed. Whereas the card index points to pieces of information drawn from multiple documents in a special library collection and is interminable in that it is, in principle, open to further growth in its content over time, the book index is limited in its coverage to the text contained within the pages of a book (whether single or multivolume) and is terminable in that it is bounded in its content and incapable of further growth. To be sure, Kaiser did not view interminable and terminable indexes to be entirely discontinuous from one another. In fact, he broached the idea that very large terminable indexes might, in some way, asymptotically approach interminable indexes in their structure: in his words, "if we take the terminables large enough they gradually assume the form of interminables" (Kaiser 1911, § 579). Nevertheless, even if he allowed for some continuity between the two, he held that the differences between the card index *qua* interminable index and the book index *qua* terminable index are sufficiently large that the canons of his indexing system, designed for the former, must be accommodated to fit the needs of the latter.

The bulk of this paper has been given over to a discussion of the distinctive features of the book index version of SI and consideration of how these differ from, or stand in continuity with, the card index version. The fundamental points of commonality are the following. Both versions of SI are based on a category scheme that partitions index terms into one of three categories: terms for Concretes, terms for Countries, and terms for Processes. Both are grounded in the tenet that, in principle, all subjects are to be expressed not by isolated terms but by statements, i.e., complex strings of subject terms, in which the first term of the statement is be subdivided by the terms following it. Both utilize a form of word-by-word alphabetical arrangement for their filing order and both make use of cross-

references to direct the user of the index from a given term to thematically related terms. In these essentials, the two versions of SI are in harmony.

Yet, even as the two versions of SI begin from many of the same premises, they soon diverge. This is best observed in their treatments of statements. As we saw earlier, Kaiser developed a set of strict syntactic rules for formulating statements, according to which terms for Concretes or Countries always have precedence over terms for Processes: one of the former always serves as the main term of the statement, while the latter always functions as a subdivision (cf. Sections 3.3 & 4 above). At this point, the different natures of interminable and terminable indexes come into play and lead to differences in the application of these rules. Interminable indexes are ever open to further growth, which is, however, unpredictable and may be uneven: moreover, they have the potential to become very large. In order to counter the entropic consequences of such growth, Kaiser (1911, § 574) held that it is necessary to apply "the formulation of the statement" with all "stringency". By contrast, the fixed and bounded nature of the terminable index allows for greater flexibility in the framing of statements and so Kaiser permitted the creators of book indexes a latitude in the formulation of entries that he did not concede to curators of card indexes. In the case of small entries (i.e., entries possessing few locators), he allowed for the formulation of headings that did not involve any subdivisions at all, claiming that such headings constitute reduced forms of statements (§ 577) and, indeed, as was noted earlier, his method of fashioning book index headings did, in fact, involve a phase of "condensing" in which such reductions took place (see Section 3.3 above).[43] More radically yet, Kaiser countenanced the contravention of the rule that, in statements, terms for Processes must always serve as subdivisions of terms for Concretes or terms for Processes and so, in the book index, terms for Processes, as well as terms for Concretes and Countries can assume the role of a main heading (see Section 4 above).

Kaiser's relaxation of the rules hedging the construction of statements mark perhaps the most radical structural divergence between the book and the card versions of SI. However, we have documented many other differences between the two. For example, in the card index, all the terms in a statement, whether the primary filing term or a subdivision thereof, are to take the form of nouns or noun phrases that phrased in such a way that they are singular in number and avoid prepositions, if at all possible (see Section 3.1 above). In contrast to such formal austerity, the subheadings of the book indexes that Kaiser created feature a luxuriant abundance of grammatical forms, including noun, prepositional, adjectival, and verbal phrases (see Section 3.3 above). Or, again, the locators in the book index version of SI take the form of Arabic numerals referring to paragraph numbers in a book, whereas the locators

[43] Interestingly, though, one commentator has suggested that, in the canonical card index form of SI, the bipartite statement forms [Concrete]–[Process] and [Country]–[Process] are best interpretated as reduced forms (i.e., [Concrete]–Ø–[Process] and [Country]–Ø–[Process]) of the tripartite forms [Concrete]–[Country]–[Process] and [Country]–[Concrete]–[Process]; cf. Dousa 2013, 485-487. If this interpretation is correct, then the reduction of statements would be a feature of both the card and the book index versions of SI, though unlike the latter, the former never reduces to a singleton index term.

in the card index version are call numbers referring to documents in a special library collection, the alphanumeric form of which reflects the format-based classification that Kaiser favored for the physical organization of materials in special libraries (see Section 3.2 above). As a consequence of such divergences in form, the book index version of SI has a vastly different physiognomy from the card index version, one that is far more conventional in its appearance than the latter: indeed, if one were to encounter the indexes to *Card Index* and *Systematic Indexing* without a prior knowledge of SI, one would be hard pressed to distinguish them from many book indexes compiled without any knowledge of Kaiser's indexing methodology.[44]

Despite all of the formal differences noted above, Kaiser (1911, § 627) was convinced that the book index is, in essence, "an abbreviated card index and must therefore yield to the same or similar methods". On this view, the book index version and the card index version of SI share a common deep structure that, in the case of former, has been subjected to certain transformations that have resulted in a different surface manifestation. There is unquestionably a measure of truth in this: otherwise, it would be impossible to speak of the book index and card index as versions of a common KOS—*in casu*, SI. Yet, at the same time, such a view ineluctably raises the question of what the identity conditions of being a version of a given KOS are—how many and what kinds of transformations can the deep structure undergo before the resultant surface manifestation ceases to be a version of the original KOS and becomes a new KOS unto itself? This is a difficult question that cannot be answered here. Suffice it to say that, for his part, Kaiser (1911, §§ 415, 574, 645) appears to have viewed adhesion to his category schema and to the use of statements in the constitution of an index as indispensable criteria for being a version of SI, and firmly believed that his method for compiling a book index (see Section 3.3 above) does make use of both categories and statements, even if these structures are not manifestly visible in the pages of the resultant index, where headings can be terms from any of the three categories and where many of the subheadings bear little resemblance to the fixed forms of the terms serving as subdivisions in card index statements.

Ultimately, the differences between the card index and book index versions of SI may be best explained by the need to apply a common set of indexing principles to two very different environments. In drawing the distinction between interminable and terminable indexes, Kaiser put his finger on a very important factor conditioning the divergence between the card and the book index: because of its open-endedness, the former has the potential to become much larger than the latter and so, to assure "the control of numbers" (cf. Section 3.3 above), it is crucial to maintain a certain predictability of structure, especially in the formulation of statements, which serve as the "fixed points" on the basis of which the index file is organized: failure to do so can lead to costly duplication of effort for the indexer and, as Kaiser saw it, confusion for the user (see Section 4 above). The book index, by contrast,

[44] The case is somewhat different for the indexes to the reports of the Tariff Commission, which, as noted in Section 3.3 above, tend to preserve more features of the canonical forms of the card index version of SI, especially in their larger headings.

is inherently limited in size and so does not need as rigid a formal scaffolding at the levels of the individual heading, the individual entry, and the index file as a whole to serve as an instrument of effective search: as Kaiser (1911, § 576) put it, "we can adapt our plan to the various subjects and to the amount of information given" so that "[w]here there are only a few entries, the treatment can be correspondingly abbreviated." Thus, the difference between interminable and interminable indexes matters. However, one should not underestimate the importance of the different physical forms that card and book indexes take for the divergences in their formal structure. Printed in columnar form upon pages, book indexes are compact in form and it is easy to scan through their entries, whereas card indexes, in which individual entries are entered upon cards that are then filed in drawers embedded in cabinets, are materially bulky and so require much more effort on the part of a user who wishes to scan their contents. Kaiser acknowledged as much, writing that

> If it comes to the worst, if we cannot find a direct entry in the book index for what we desire, we can read or scan the whole index to trace it, or to consult what comes nearest to it, and it would cause us little trouble comparitively [sic]. With a large card index such a course would be impossible, at any rate it would only be resorted to on very special occasions (§ 576)

The different material conditions governing the use of book and card indexes formed the background against which Kaiser formulated his rules for both versions of SI: it is not implausible to suppose that the formally more relaxed structures of the book index version of SI were conditioned, in part, by the fact that the physical form of the book index allows for an easier overview of its contents than a card index does. At any rate, it is clear that the changes in the surface manifestation of SI in its book index version are the result of an attempt to adjust its principles to the requirements of the book index, which are quite different from those of a card index. In Kaiser's application of SI to the book index, then, practical considerations ultimately trumped the structural purity of his indexing system.

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