How Information Science Helped to Shape the Emerging Field of Terminology in Canada (1973–81)

Comment la discipline des sciences de l'information a-t-elle contribué à l'évolution de la discipline émergente de la terminologie au Canada (1973–81)

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Abstract: As the field of terminology began to take shape in Canada in the 1970s and early 1980s, it became clear that traditional linguistics methods were not sufficient to support this new field of activity. Following an analysis of five seminal Canadian French language works on terminology published during this period, we illustrate that information science had a significant influence on the development of terminology methodology by contributing ideas relating to information literacy, referencing, knowledge organization, and controlled vocabularies.

Keywords: terminology, translation, methodology, Canada, history

Résumé : Au moment où la discipline de la terminologie a commencé à prendre corps au Canada pendant les années 1970 et 1980, il était évident que les approches linguistiques conventionnelles ne suffiraient pas pour appuyer ce nouveau domaine d'activité. Nous analysons le contenu de cinq ouvrages canadiens précurseurs de langue française qui portent sur la terminologie et qui ont paru pendant cette période. Ces ouvrages font preuve de l'influence importante que les sciences de l'information ont portée sur le développement de la méthodologie terminologique en fournissant les idées qui sont liées à la littératie de l'information, aux systèmes de référence, à l'organisation des connaissances, et à la normalisation terminologique.

Mots-clés : terminologie, traduction, méthodologie, Canada, histoire

Introduction

There is a relatively new field of linguistic activity known as terminology. As described by Juan C. Sager (1990, 2), "terminology is the study of and the field of activity concerned with the collection, description, processing and presentation of terms, i.e. lexical items belonging to specialised areas of usage of one or more languages." Terminology is often generally understood in contrast to lexicography. Whereas lexicographers compile dictionaries containing words from the general language, terminologists prepare glossaries of terms from specialized

domains of knowledge. Discussions about the need for such a field of activity began to surface as far back as the 1930s, when an Austrian engineer named Eugen Wüster (1931) emphasized the need for clarity and precision in technical communication. It was largely due to Wüster's pioneering efforts that the Technical Committee for Terminology Standardization of the International Organization for Standardization was established in 1952. However, it was not until the 1970s that the field of terminology as we know it today truly began to take shape.

Although terminology is firmly rooted in linguistics, there is widespread recognition that it is an interdisciplinary field of activity. For instance, in the introduction to the first volume of the international scientific journal *Terminology* in 1994, the journal editors Kurt Loening and Helmi Sonneveld (1994, 3) observe that "terminology . . . is not based on linguistic principles alone, but is itself essentially of a multidisciplinary nature." Along with other terminology researchers, such as Juan Sager (1990, 3), Heribert Picht and Jennifer Draskau (1985, 22), and Teresa Cabré Castellvi (1999, 25), they refer to contributions from disciplines that include cognitive science, computer science, and information science, among others. However, beyond this type of general acknowledgement, we know of no detailed analysis of specific contributions made by information science to the formation of this new field of activity. The question of interdisciplinarity is one that has also been regularly considered within the field of library and information science (LIS) (for example, Saracevic 1999; Cronin 2008). Bibliometric and citation analyses of the LIS literature (for example, Tang 2004; Chang and Huang 2012) and of dissertations produced in LIS doctoral programs (for example, Shu et al. 2016) provide convincing evidence to show that information science both draws on, and contributes to, many other disciplines, including computer science, education, communication, and linguistics, to name just a few. Indeed, interdisciplinarity is so firmly entrenched in LIS that it may be difficult tease out the precise ways in which information science has inspired or influenced other domains.

In the April/May 2003 issue of the *Bulletin of the American Society for Information Science and Technology* (since renamed the Association for Information Science and Technology), then President Trudi Bellardo Hahn (2003, 2) sought to answer the very challenging question: "what has information science contributed to the world?" In her short editorial, Bellardo Hahn, with input from colleagues, identified five major categories of accomplishment. With the goal of publishing an authoritative list of accomplishments on the association's website, Bellardo Hahn went on to encourage the wider information science community "to debate the content of this list, to suggest additions or items that should have high priority, to identify the pioneers and to date seminal discoveries, developments or inventions" (3). In this general spirit, the goal of this article is to explore in more detail the ways in which information science has contributed to the formative years of terminology, focusing, in particular, on the ways in which ideas and practices from information science inspired the development of an initial methodology for conducting terminology work in Canada in the

1970s and early 1980s. To the best of our knowledge, no prior research has focused explicitly on identifying the ways in which methods and resources developed and used in the information professions were borrowed, adapted, and integrated into the working practices and education of Canadian terminologists during the nascent years of this new field. In addition, since the work of developing methods and corresponding training materials for Canadian terminologists was carried out and documented almost entirely in French, we hope to make these contributions that were made by information science to terminology accessible to a broader audience by reporting on this investigation in English.

The article is divided into five main sections. First, we set the scene by describing the context in which terminology work developed and continues to take place in Canada. Next, we introduce the corpus of five seminal Canadian terminology publications that forms the basis for this study and that is investigated for evidence of contributions from information science to the emerging discipline of terminology. This is followed by a presentation of the findings and then a discussion of the themes identified in the corpus. Finally, we offer some concluding remarks about the historical and ongoing relationship between the two highly interdisciplinary fields of information science and terminology.

Translation as a driving force for the emergence of terminology in Canada

As pointed out by Guy Rondeau (1981, 38) in the years that followed Eugen Wüster's early efforts to encourage clear and consistent technical communications, various groups began working earnestly in the area that came to be known as terminology. Consequently, different schools of thought emerged, including the German–Austrian school, the Soviet school, the Czechoslovakian school, and the (Canadian) Quebec school. It has been observed that, among these various schools, the Quebec school distinguished itself by its close ties to translation as well as by its strong focus on working methods and pedagogy (Rondeau 1981; Auger 2001; Delisle 2008).

Although terminology work can be carried out in a monolingual context, in Canada it is strongly associated with translation (Kerpan 1977, 46–47). Given that Canada is a bilingual country where both English and French enjoy official language status, translation is an important activity. It must be noted, however, that most of the translation that takes place in Canada is from English into French and not the other way around (Mareschal, 2005, 252). Translation is almost as old as writing itself and has a long and colourful history. It is well documented, for instance, that translation has accompanied virtually every significant scientific and technological discovery (Byrne 2012, 3). Translation is the means of exporting these inventions and discoveries to other languages and cultures. The twentieth century saw a flurry of scientific activity, and the years following the Second World War bore witness to a corresponding explosion in the number of scientific journals that were published. According to Paul Horguelin (1966, 16), this number more than doubled in the 20-year period after the war, rising from 24,000 to 60,000. What is more, as English began to

establish itself as the predominant language for scientific publication and global business, the need for translation became more pronounced. Soon, it became challenging for translators to keep up with the demand for their services.

As early as 1955, John Holmström (1955, 76), a public servant working for the United Nations Educational, Scientific and Cultural Organisation, suggested that to support translators, some member of the team should be "made responsible for the function of providing help and guidance in the rendering of special terms, of issuing directives in the interests of uniformity and of building up a terminological card file for future reference." Meanwhile, the following year, French translator Edmond Cary (1956, 103) proclaimed "a new science is taking shape—terminology," noting that this development was largely owing to the increased demand for translation.[1] By the 1960s, translators working for the Government of Canada's Translation Bureau estimated that more than one-third of their time was spent researching specialized terminology (Dubuc 1972, 36). To increase translators' productivity, it would be necessary to find a way to reduce the amount of time they devoted to terminology research. Therefore, in Canada, terminology began to emerge as a new field of activity that was auxiliary to translation.

Commenting on the state of terminology in Canada near the end of the 1960s, Jean Delisle (2008, 124) observes: "In 1968, terminology was not taught, textbooks did not exist, terminological research methods were embryonic, computerized term banks had not been developed, and the tasks of terminologists had yet to be defined."[2] Yet, driven by the needs of the rapidly expanding translation industry, terminology training was clearly needed. Therefore, it is not surprising that the first efforts at providing formal training in terminology took place within translator education programs. The first course in terminology was offered in 1969 as part of the bachelor of arts in translation program at the Université de Montréal, followed in 1972 by a terminology course at the Université du Québec à Trois-Rivières. Indeed, each of the 12 undergraduate translation programs that were established in Canada in the 1970s and 1980s included at least one course in terminology (273). Where there is teaching, there is also a need for teaching materials, and it was during the 1970s that the first serious efforts to develop and document a methodology for conducting terminology work in a Canadian context took place. In the period between 1973 and 1981, Canadian professors, translators, and linguists produced five seminal publications on terminology. The product of careful reflection and experimentation, these five groundbreaking contributions, some of which generated further editions, would prove to have staying power. The next terminology books written chiefly for a Canadian audience did not appear until 20 years later.[3]

General methodology and corpus description

Our approach to learning more about how information science influenced and inspired the early development of terminology in Canada has been to closely read the five Canadian publications on terminology that were produced between 1973 and 1981 to identify themes that reveal underlying contributions from

information science. In this section, we will provide a general introduction to the five works in the corpus, before going on to discuss their information science-related content in more detail in an upcoming section.

Guide de travail en terminologie

In Canada, the Office de la langue française (OLF) (French language bureau) was a pioneering institute in the field of terminology (Rousseau, 1990). As part of its efforts to support and promote the use of the French language in Canada, the OLF sought to establish effective working methods for terminologists. The first version of the guide for terminologists was published in 1973 under the title *Guide de travail en terminologie* (*Guide to Working in Terminology*) (Corbeil 1973). The 103-page volume was prepared by five of the OLF's so-called "cultural agents"—Pierre Auger, Bruno de Bessé, Bernard Salvail, Jean-Marie Fortin, and Anne-Marie Beaudoin—under the direction of the OLF's linguistic director Jean-Claude Corbeil. In the introduction, Corbeil indicates that a preliminary version of the guide, consisting essentially of professional tips and tricks, had originally been conceived for internal use by OLF staff (9). However, there had been considerable interest among members of the wider translation community, and, therefore, this somewhat more polished version had been produced for publication and dissemination. Corbeil also suggests that this published version could potentially serve as a training manual for students.

The stated aims of the volume are modest. Noting that the field of terminology is in its infancy, Corbeil indicates that a main goal is to sketch out a methodology for terminology work and that this methodology has been based on experimentation. He also states that this guide represents a first attempt and that the content will undoubtedly evolve as more people attempt to implement these methods and provide feedback on their experiences. He closes the introduction by stating that, if necessary, a revised edition will be produced based on the results of such feedback and further experimentation. In the four main chapters, the OLF's contributors present their definition of terminology, delimit the object of terminology work, describe in detail the steps involved in conducting a terminology project, and propose a format for recording the results of terminological research.

Méthodologie de la recherche terminologique

Indeed, the OLF's initial guide did continue to evolve, and it was replaced in 1978 by an 80-page volume entitled *Méthodologie de la recherche terminologique* (*Methodology of Terminology Research*), which was prepared by the OLF's head of terminology services Pierre Auger and terminologist Louis-Jean Rousseau, with input from three other OLF terminologists (Rosita Harvey, Jean-Claude Boulanger, and Jean Mercier) (Auger and Rousseau 1978). Once again, the project was carried out under the direction of Corbeil, this time credited as the OLF's director of terminology. This volume incorporated the knowledge that had been acquired during the intense period of terminology work in the intervening years, and, in the introduction, Pierre Auger and Louis-Jean Rousseau express their hope that

it could serve as a methodology for all terminology work carried out in Quebec (12). It was later translated into Spanish and Catalan and cited in Alain Rey's (1979) book *La terminologie: noms et notions* (*Terminology: Names and Concepts*), which was published as part of the popular "Que sais-je?" series by the Presses Universitaires de France in 1979. Such efforts led to increasing international recognition for the Quebec school of terminology.

In the five chapters of this volume, readers find a detailed presentation of the preparatory work that precedes a terminology project; a detailed description of the steps involved in terminological research; an approach to neology and term creation; an overview of ad hoc term research; and a protocol for creating and using term records. One element missing from the volume, which Auger and Rousseau (1978, 11) regretfully note could not be included for lack of time and resources, is a lexicon or glossary detailing the emerging metalanguage used to discuss terminology.

Vocabulaire systématique de la terminologie

Such a glossary was indeed published by the OLF the following year under the title *Vocabulaire systématique de la terminologie* (*Systematic Vocabulary of Terminology*) (Boutin-Quesnel et al. 1979). It was compiled by four practising terminologists—Rachel Boutin-Quesnel, Nycole Bélanger, Nada Kerpan, and Jean-Louis Rousseau—who collected an inventory of some 200 terms that were relevant to the burgeoning field of terminology. Each term was accompanied by a definition and an English-language equivalent, and the entries were systematically organized into three main categories: terminology theory, methodology, and types of terminology collections. This document was the first of its kind in the field, and its main objective was to describe the terminology used by terminology theorists and practitioners. The authors also foresaw a pedagogical value in the collection; in addition to practising terminologists, professors are specifically identified as an important target audience for the volume (7).

The glossary is one of the most concrete achievements of the Quebec school of terminology, and it helped to consolidate the foundations of the discipline. According to Jean Delisle (2008, 191), the vocabulary had a sort of unifying effect on terminologists working across Canada by providing them with clear definitions of key concepts and a common metalanguage with which to discuss their work. Owing to the rapid evolution of the field, as well as to the feedback received on this document, a revised and updated second edition was published in 1985.

Manuel pratique de terminologie

The first full-fledged textbook to be published in Canada on the subject of terminology was Robert Dubuc's (1978) 102-page *Manuel pratique de terminologie* (*Practical Manual of Terminology*). Now definitively considered to be a classic, the first edition appeared in 1978, and it was followed by a second edition in 1985, a third edition in 1992, and a fourth edition in 2002. It was also adapted into English in 1997 by Elaine Kennedy under the title *Terminology: A Practical*

Approach. Thus, for over 30 years, Dubuc's *Manuel*, in its various editions, remained a fundamental tool for educating translation and terminology students in Canada and beyond (Delisle 2008, 278).

In explaining his motivation for producing the book, Dubuc (1978, 5) stresses that, over the course of the first decade that terminology was taught in Canada, it became clear that there was a pressing need to set out a straightforward and coherent set of principles that professors could use as a basis for teaching students the essential elements of this new profession. Commenting on the third edition, John Humbley (1993, 31) describes Dubuc as the grand master of terminology and attests to his success in creating and maintaining a wholly accessible and pedagogical guide for newcomers to the field. The nine chapters of the first edition include a definition of terminology, a detailed description of how to conduct both ad hoc and thematic terminology research, an explanation of concept analysis, and instructions for preparing term records. As is befitting a textbook, each chapter also includes suggestions for practical exercises.

Introduction à la terminologie

In contrast to the four works described above, Guy Rondeau's (1981) 238-page *Introduction à la terminologie* (*Introduction to Terminology*), which came out in 1981, was not primarily practical in its orientation, nor was it focused only on the Canadian context. Rather, Rondeau used the book to posit some theoretical foundations for terminology and to inventory some of its applications around the world. The volume was encyclopaedic in nature, presenting an international panorama and historic synthesis of the major trends that were unfolding in this still relatively young field. With it, Rondeau succeeded in bringing together in one volume information that had previously been widely dispersed. In many ways, it complemented the existing practical Canadian works on terminology, which had remained relatively silent on the history of the field and on the developments taking place outside of Canada. Rondeau, a professor at Université Laval, targeted the volume primarily at professors and students who wanted to learn more about the discipline and who were looking to situate the work taking place in Canada in a broader context. A revised and updated second edition appeared in 1984.

Summary of the corpus contents

In summary, between 1973 and 1981, five key publications on terminology were published in Canada. These seminal works from the Quebec school, published in French, served to document the development and evolution of a methodology for terminology work and served as teaching material to train Canada's first generation of terminologists. The list below summarizes key features of each volume:

1. Jean-Claude Corbeil (ed.), *Guide de travail en terminologie*: The first volume on terminology to be published in Canada, it was a modest effort intended

to launch discussions on the development of a methodology for conducting terminology work. It was based largely on the professional tips and tricks gleaned through the experience of the employees of the OLF.

2. Pierre Auger and Louis-Jean Rousseau, *Méthodologie de la recherche terminologique*: A reworked and refined version of the initial OLF volume, this work took into account the experience and knowledge gained by attempting to implement the earlier versions of a terminological methodology. It was more widely distributed and helped to garner international recognition for the Quebec school of terminology.
3. Rachel Boutin-Quesnel, Nycole Bélanger, Nada Kerpan, Nada, and Louis-Jean Rousseau, *Vocabulaire systématique de la terminologie*: A complement to the OLF's methodology document, this structured glossary of terminology vocabulary was the first of its kind in the field and was intended to describe the metalanguage of terminologists. It had a unifying effect on Canadian terminologists and helped to establish terminology as a distinct field of activity.
4. Robert Dubuc, *Manuel pratique de terminologie*: The first fully developed textbook on terminology to be published in Canada, this highly respected volume would go on to generate multiple editions (1985, 1992, and 2002) and an English translation (1997). It contained a detailed description of the steps involved in terminology work, accompanied by practical exercises for students.
5. Guy Rondeau, *Introduction à la terminologie*: The first Canadian volume to break away from a purely practical perspective, this work nonetheless provided an overview of approaches to terminology and helped to situate the work that was being carried out in Canada in a wider international context.

Findings

As noted above, the methodology for carrying out terminology work was actively developing during the 1970s and early 1980s, and these five works provide a good representation of how it evolved during this time in Canada. In this section, we will first present a general overview of the main steps that emerged as being important for conducting terminological research. Having this high-level understanding of how a terminologist works will help readers to better process the more specific discussion that follows, which considers how principles and practices from information science contributed to the development of a methodology for the newly emerging field of terminology in Canada.

Overview of the main steps in a terminology research project

The goal of a terminology research project is to produce a glossary or collection of term records that contains a comprehensive coverage of the terms belonging to a specialized field (or subfield) of knowledge. A glossary typically contains a structured list of the preferred terms, accompanied by additional linguistic information such as a foreign language equivalent, related terms (for example, synonyms, abbreviated forms, and spelling variants), and part of speech. The term is also accompanied by a definition as well as a context showing an example

of the term in use. Sources are clearly documented. An alphabetical index accompanies the structured collection to facilitate looking up the words.

To produce a glossary, terminologists working in Canada in the 1970s typically followed these main steps. First, terminologists did some background reading to familiarize themselves with the specialized subject field. Next they compiled a documentary corpus that they then examined to identify the terms that are proper to the subject field at hand. As they read the corpus, terminologists extracted not only the potential terms but also additional information that could be used to help them map out the conceptual structure of the field and understand the relations between the concepts. Information that could be used to help define concepts or demonstrate examples of the term in use was also collected. The data were then analysed to complete tasks such as identifying which term would be the preferred term (and which would be designated as synonyms) or defining the term. In Canada, where terminology was almost exclusively carried out in a bilingual fashion, all of these preceding steps were conducted independently in both French and English and then an additional interlingual analysis was carried out to establish a conceptual match between the concepts in both languages and to confirm linguistic equivalence. Finally, the results would be compiled into a glossary or collection of term records.

Contribution of information science to terminology

In this section, we present several themes that were identified in the five works described above, focusing specifically on those terminological activities that were inspired by work being carried out in information science.

Focus on information literacy

From the beginning, it was recognized that the success of a terminology project rested on having appropriate documents in the corpus. Corbeil (1973, 44) emphasizes the value of library resources such as catalogues and bibliographies for helping terminologists to identify suitable documents for inclusion in the corpus. Auger and Rousseau (1978, 27) distinguish between the reference corpus, which is used for background reading, and the corpus to be analysed. Like Corbeil, they suggest using bibliographic tools such as indexes, but they also recommend consulting with specialists who work at specialized documentation centres for guidance. Similarly, for Dubuc (1978, 137), the ability to locate, evaluate, and make maximum use of appropriate documentation was paramount. Rondeau (1981, 35), for his part, goes so far as to state that it is not possible to separate terminology from documentation as each terminology project is based on specialized documentation.

While there was previously a general acknowledgement that the quality of the documentation in the corpus was important, Dubuc (1978, 52) was the first to suggest possible criteria for evaluating document quality, including the quality of the writing, the credibility of the author, and the importance of the work in the field. Rondeau (1981, 52–54) expands on this list, adding items such as publication date and intended audience, among others. Indeed, Rondeau devotes

several pages to discussing the challenges associated with identifying and evaluating documentation, and, thus, we see an increasing emphasis of the importance of information literacy and the critical evaluation of information sources within the field of terminology.

Insistence on referencing

Properly referencing the documentation used for a terminology project is a practice that is also strongly emphasized. Although lexicographers keep a record of the sources used in their research, this information is not typically included in a final product, such as a dictionary. In contrast, terminologists are encouraged to explicitly record the bibliographic details of the source documentation on the term records (Corbeil 1973, 29, 42). As explained by Rondeau (1981, 85),

> working methods in terminology rightly attach great importance to accurate referencing, not only for the entry (preferred term and foreign language equivalent), contexts, definitions, usage notes, and illustrations, but also for any other information that appears on the term record. Indicating the sources is all the more important in terminology because the quality of the terms depends on the quality of the sources from which they are extracted.[4]

Glossary users, such as translators, use the references to help them decide whether the recommended term is a good choice for inclusion in the text that they are translating. For instance, the publication date could alert a translator to the fact that a term may no longer be current, while the text type could inform the translator that the target audience for their text is different from the target audience of the source document and may thus require a different linguistic register. Translators therefore depend on having access to accurate bibliographic information to help them make informed decisions when using terminology resources. Dubuc (1978, 81) and Auger and Rousseau (1978, 78) provide explicit instructions for preparing bibliographic records. Meanwhile, Rondeau (1981, 85) notes that while the format for recording the bibliographic references may vary from one project to the next, there is no question that it is imperative to record this information.

Emphasis on knowledge organization

Before there was an established methodology for carrying out terminology work in Canada, those charged with conducting terminological research experimented and did the best they could, drawing mainly on approaches used by nineteenth-century lexicographers (Delisle 2008, 42). However, lexicographers take a semasiological approach to their work, which means that they begin by identifying the lexical item and work toward establishing its definition. In other words, lexicographers ask the question: "what does the word X mean?" It soon became clear that this approach had limitations in terminology, where it was important to understand the subject field as a whole rather than considering the terms in isolation. Indeed, a more appropriate question for terminologists seemed to be "what do you call X?," which takes the concept as the starting point rather than the term. Therefore, these early terminologists soon began looking beyond

lexicography to draw inspiration from other disciplines too, including information science. An examination of the contents of the glossary of terminology prepared by Boutin-Quesnel and colleagues (1979) reveals several entries relevant to knowledge organization, which have been borrowed or adapted from information science:

- *analyse notionnelle* (subject/concept analysis)
- *classement systématique* (subject order)
- *index* (index)
- *notion* (concept)
- *relations internotions* (semantic/conceptual relations)
- *terme générique* (broader term)
- *terme spécifique* (narrower term)
- *terme privilégié* (authorized term)
- *terme rejeté* (non-authorized term)
- *vedette* (heading/entry term)

Information about knowledge organization proved to be useful to terminologists in several different ways, including helping them to produce a conceptual map for the subject field under investigation, helping them to identify the conceptual relations needed to create definitions and establish interlingual equivalents, and helping them to present the results of their research in a structured format.

Subject field breakdown

For instance, Corbeil (1973, 28) advises that an early and important step in a terminology project involves delimiting the domain that will be the subject of the research. He indicates that it is not sufficient to simply give the name of the domain, but, rather, it is necessary to clearly specify the subdivisions or branches of the domain that will be taken into account as well as those that will be excluded from the project. He suggests that a terminologist can facilitate this task by taking as a starting point an existing classification, such as the universal decimal classification.

Auger and Rousseau (1978, 17) take things further, noting that for each subdomain, the terminologist should prepare a structured list of concepts. According to Auger and Rousseau, the elaboration of a concept system makes it easier for a terminologist to get a better overview of the subject field and to understand the relations between the concepts. They likewise suggest consulting thesauri and subject classifications as models to help guide this process (20), a recommendation that is later echoed by Rondeau (1981, 72).

Dubuc (1978, 36) is the first from the Quebec school to use the word onomasiological to describe the concept-to-term direction of terminology research, and, like Auger and Rousseau, he advocates strongly for the elaboration of a concept system that illustrates how the various concepts in a subject field are related to one another. Not only is the resulting conceptual map useful for providing the terminologist with a general overview of the subject field, it also provides vital information for later stages of the terminology research project, such as definition construction and the establishment of interlingual equivalence.

Establishing definitions and interlingual equivalents

After noting that definitions represent one of the most complex aspects of terminology work, Corbeil (1973, 26) explains that one very effective way to define a term is to refer to its broader term (that is, a more generic concept) and to indicate how it differs from its coordinate concepts. This method is also advocated by Dubuc (1978, 98), and, to do this, the terminologist must have a good understanding of the semantic relations in play. Indeed, Boutin-Quesnel and colleagues (1979, 27) provide the following definition of the term *définition* (definition), which draws attention to the importance of conceptual relations for definition construction: "Definition: a statement that describes a concept and allows it to be differentiated from other concepts within a concept system."[5]

Meanwhile Dubuc (1978, 72) explains, and Rondeau (1981, 33) confirms, that the way to establish whether a French and an English term are equivalent is to determine whether they both refer to the same concept. This requirement comes out clearly in the definition for *équivalent* (equivalent) that is provided by Boutin-Quesnel and colleagues (1979, 20): "Equivalent: each of the terms of different languages that designate corresponding concepts."[6] Hence, once again, understanding the place of a concept within the concept system is critical.

Systematic presentation of entries

The emphasis on knowledge organization in terminology also extends to the way the contents of glossaries are organized. In contrast to lexicography, where most of the dictionaries use alphabetical ordering to present their entries, Corbeil (1973, 67) and Auger and Rousseau (1978, 46) encourage a systematic organization for terminology glossaries, identifying several benefits to this latter approach. For example, in the same way that the conceptual map could help the terminologist to gain a better understanding of the overall subject field, so too could a structured presentation help the glossary user to better understand how the different concepts are related to one another. Corbeil (1973, 68) recognizes that systematic ordering requires a more complex design and a greater effort on the part of the terminologist than does alphabetical ordering, but he argues strongly that it is more advantageous for the user. Nonetheless, when a terminological resource is ordered systematically, Corbeil recommends providing a corresponding alphabetical index to facilitate look up.

Boutin-Quesnel and colleagues (1979) put this recommendation into practice when producing their glossary of terminology. The glossary adopts a systematic ordering for its entries, which are divided into three main categories (terminology theory, methodology, and types of terminology collections), with further levels of subdivision. The systematic presentation is accompanied by an alphabetical index.

Accent on terminological standardization

Lexicography is largely a descriptive activity, where lexicographers record and present evidence of general language as it is used; however, early approaches to terminology had more prescriptive goals. Facilitating specialized communication is a main objective of terminology, and, therefore, terminological standardization garnered considerable attention in the early days. As observed by Dubuc

(1978, 124), excessive synonymy can lead to confusion or imprecise communication, so terminologists can reduce ambiguity by identifying a preferred term for each concept and relegating others to the status of synonyms or variants. Similarly, the case of polysemy, where one term has multiple meanings, can also be problematic and may need to be resolved by proposing new terms for the additional meanings. In this way, terminologists were adopting practices similar to those used in information science to develop controlled vocabularies (for example, authorized and non-authorized terms), and the terminologist's documentary corpus served as their means of establishing "literary warrant."[7]

Corbeil (1973, 22) uses the example of a thesaurus to explain how all of the terms designating a given concept are grouped together in a single entry, commenting that for a given concept, one preferred term is chosen and all the possible synonyms point back to that preferred term. Dubuc (1978, 30) describes standardization as an attempt to discipline usage, and he goes on to propose several factors that should be considered during the standardization process, including the frequency, usability, motivation, and appropriateness of the term. Meanwhile, according to Rondeau (1981, 43), the principle of univocity—which states that each concept should be designated by only one term, and that each term should be used to designate only one concept—emerged as a basic principle that was strongly adhered to by the Quebec school of terminology.

Summary of key contributions

To sum up, there are four main areas in which Canada's first terminologists were inspired by information science and integrated practices from the information professions into the emerging methodology for terminology work:

1. Information literacy: A terminologist's ability to locate, evaluate, and optimize appropriate documentation is recognized as being critical, and criteria for evaluating documentation are introduced.
2. Referencing: There is an insistence on accurately and overtly recording the bibliographic details of all sources used to produce a term record because the quality of the terminology product is inextricably linked to the quality of the documentation on which it is based. The format of the references may vary, but their inclusion is non-negotiable.
3. Knowledge organization: Understanding the concepts in the subject field under investigation, and particularly their relationships with one another, became a central objective in terminology work. This effort to identify and represent concept relations manifested itself in several ways, such as producing a systematic breakdown of the subject field, using information about semantic relations to create definitions and to establish equivalence between terms in different languages, and presenting the final glossary in a structured format rather than in the more traditional alphabetical order used by lexicographers.
4. Terminological standardization: Synonymy and polysemy are recognized as impediments to clear specialized communication, so terminologists are encouraged to reduce ambiguity and promote consistency by identifying preferred terms and ensuring there is a one-to-one correspondence between concepts and terms.

Discussion

As pointed out by Delisle (2008, 169), Canadian linguists first began to reflect seriously on the theory and methodology of terminology in the 1970s. It was during this decade that Canada's terminology community began to organize itself, to equip itself with conceptual tools and a metalanguage, to outline working methods, and to submit their ideas to the test of experience. Early efforts drew heavily on methods used in lexicography, but it soon became clear that these alone would not suffice and that budding terminologists would need to look elsewhere for additional inspiration.

One of the disciplines that terminologists turned to was information science. In the five seminal Canadian works on terminology, we see evidence of direct and indirect references to tools and techniques used regularly in information science. For instance, there are numerous recommendations made by Corbeil (1973, 28), Auger and Rousseau (1978, 19), and Dubuc (1978, 23) to consult tools and resources such as thesauri, catalogues, bibliographies, as well as information professionals for assistance with tasks such as corpus compilation and subject field breakdown. Boutin-Quesnel and colleagues (1979) include concepts and terms from information science in their glossary of terminology (for example, broader/narrower term, authorized/non-authorized term) and present the final glossary in a structured format.

The first four terminological works to be published in Canada were highly practical in their orientation and contained very few references to existing literature. However, Rondeau (1981) incorporated more theoretical ideas as well. This latter volume includes a 16-page list of references, including a number drawn from the field of information science. Among these, for example, we find references to several early works by Ingetraut Dahlberg, a German professor of information science who founded the journal *International Classification* in 1974, the title of which was changed to *Knowledge Organization* in 1993, and which remains an important journal in the field of information science today.

Looking back at the early days of terminology from the vantage point of the 1990s, Sager (1990, 5), a prominent European terminologist, observes that "terminology exhibits a number of striking similarities with information science." He posits that the collection, structuring, and organization of the terms needed in specialized communication could be viewed as an extension of the collection, structuring, and organization of entire texts or their bibliographic references by information scientists. He also notes that even the approach to language taken by the two professions exhibits similarities in that both terminologists and information scientists subject language to processes of regularization, unification, and standardization in the interest of achieving more effective communication. It is perhaps not surprising, then, to see shades of Harold Borko's well-known description of information science reflected in Sager's widely accepted description of terminology:

> Information science is that discipline that investigates the properties and behavior of information, the forces governing the flow of information, and the means of processing information for optimum accessibility and usability. It is concerned with that body of knowledge relating to the origination, collection, organization, storage, retrieval, interpretation, transmission, transformation, and utilization of information. It has both a pure science component, which inquires into the subject without regard to its application, and an applied science component, which develops services and products. (Borko 1968, 3)

> [Terminology] is an activity, i.e. the set of practices and methods used for the collection, description and presentation of terms; and a theory, i.e. the set of premises, arguments and conclusions required for explaining the relationships between concepts and terms which are fundamental for a coherent activity. (Sager 1990, 3)

What is more, Sager predicts that since terminology and information science both pursue the same broad objectives, they will likely continue to benefit each other moving forward (7). This has certainly proven to be the case. For instance, Lynne Bowker and Tom Delsey (2016) examine three areas of recent development where there have been fruitful reciprocal exchanges of ideas and applications between terminologists and information scientists: automated term extraction and indexing, cross-language information retrieval, and the development of applications supporting fuzzy matching.

Concluding remarks

Through a close examination of five seminal works published by members of the Quebec school in the period between 1973 and 1981, we have demonstrated that information science had a significant influence on the emerging field of terminology in Canada and particularly on the development of a methodology for carrying out terminology work. As emphasized by Rondeau (1981, 61), methodology has an extremely important place in terminology, and the strong focus on methods and on bilingual comparative terminology are features that distinguished the early Quebec school from others.

While terminology's linguistic and lexicographical roots remain evident, there can be no denying that this young field also owes much to the discipline information science, which inspired many elements of the concept-oriented methodological framework needed to carry out terminological research effectively. In Canada, the works that document the development and evolution of this nascent field in the 1970s and early 1980s were all written in French. As such, the contribution made by information studies during these critical years may not be widely recognized by the broader information science community in Canada, North America, and beyond. By reporting on these activities here, we hope that we have revealed more fully the contribution made by information science to the initial development of a terminological methodology in Canada. In so doing, we hope that we have also contributed another item that responds to Bellardo Hahn's (2003) ever relevant question "what has information science contributed to the world?"

Notes

1 All French-to-English translations in this article have been carried out by the author, who is a certified translator as recognized by the Association of Translators and Interpreters of Ontario. The original quotation in French reads as follows: "*Une science nouvelle prend corps, la terminologie*" (Cary 1956, 103).

2 The original quotation in French reads as follows: "*En 1968, la terminologie ne s'enseigne pas, les manuels sont inexistants, la méthodologie de la recherche terminologique est embryonnaire, les banques informatisées ne sont pas encore en gestation et les tâches des terminologues restent à définir*" (Delisle 2008, 124).

3 The next terminology manual aimed primarily at a Canadian audience appeared in 2001 when Silvia Pavel and Diane Nolet (2001), terminologists working for the Canadian government's Translation Bureau, published *Précis de terminologie*. This was followed in 2004 by the publication of *La terminologie: principes et techniques* by Marie-Claude L'Homme (2004), a professor in the Département de linguistique et de traduction at the Université de Montréal. We should also mention that in 1984, Tina Célestin, Gilles Godbout, and Pierrette Vachon-L'Heureux (1984) from the *Office de la langue française* published *Méthodologie de la recherche terminologique ponctuelle: Essai de définition*, which focused on conducting ad hoc terminology work rather than thematic or systematic terminology research. Given its focus on ad hoc work, we did not include this volume in our corpus.

4 The original quotation in French reads as follows: "*Les méthodes de travail terminologiques accordent avec raison une très grande importance à la mention de références documentaires précises, non seulement en ce qui concerne l'entrée (vedette, équivalent), les contextes, les définitions, les notes, les illustrations, mais encore pour tout autre renseignement pouvant figurer sur une fiche. L'indication des sources prend une importance d'autant plus considérable en terminologie que la qualité des termes est fonction de la qualité des sources desquelles ils sont tirés*" (Rondeau 1981, 85).

5 The original quotation in French reads as follows: "*Définition: Énoncé qui décrit une notion et qui permet de la différencier des autres notions à l'intérieur d'un système notionnel*" (Boutin-Quesnel et al. 1979, 27).

6 The original quotation in French reads as follows: "*Équivalent: chacun des termes de langues différentes qui désignent des notions correspondantes*" (Boutin-Quesnel et al. 1979, 20).

7 For a more detailed discussion of the notion of literary warrant, see Rodriguez (1984).

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