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# Dealing with maps: the identification of intellectual responsibilities and the application of relator codes

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## Abstract

Treatment of information about those responsible for the intellectual content of work is one of the most complicated tasks in the bibliographic description of cartographic material. There are particular characteristics that make it difficult to apply some general rules laid down by technical cataloguing manuals for recording this information[1]. The classic situation typified by the monographs — "an author and an editor" or "multiple authors and an editor" — differs from the large quantity of cartographic resources which have various contributors, with distinct functions, who contribute to the production of the resource. Field work, compilation of information and its standardization or homogenization, drawing, engraving or printing are some of the tasks often recorded on the maps associated with different individuals or organizations. In such cases, the problem is to select the person who should be considered as the principal author, determining with this choice the main entry of the record, and who should be chosen as co-authors or secondary authors. It is often difficult to know whether or not the functions performed by each one, or even by only one individual, deserve the epithet of "author" of the map.

In cartographic material a great variety of situations and many aspects can be taken into account, which allows evaluating the different solutions to problems that complicate documental treatment. Therefore, maps, loose or forming homogeneous groups, the nature of represented information, the

time and institutional context in which they are produced and published, as well as whether they are printed or digital or manuscripts, influence the procedure for giving the authorial statement.

Modern maps (produced using digital tools), although they confront librarians with problems about the determination of access points, may be easier to treat than those created prior to the nineteenth century. However, this is not a rule: old maps are not always more difficult to treat than contemporary cartography.

**Key words:** map cataloguing; authorship; relator codes

## 1. Complexity of cartographic production: authors and functions

Cartographic production involves a diverse set of activities. The acquisition of spatial data through field surveys or using various information sources and various tools is one of the most important steps. In the case of topographic maps and until the advent of aerial photography, which occurred in the first quarter of the twentieth century, the work of data acquisition was exclusively provided by the classical method, through observations and measurements made in the field. After validation of the acquired data, all the items were harmonized and, finally, the map underwent a review process. If it was edited, there was also the final drawing and printing to be carried out. But this process, briefly presented, has of course, over time, shown great developments.

The decade of the 1960s represents an important milestone in the recent transformations of cartography. As result of the technological changes that began at that point, it moved "da produção manual (ou analógica) para a produção baseada em meios informáticos (ou digital) e, por consequência, dos mapas em papel para os mapas digitais", as well as "produção, antes quase exclusivamente centralizada em profissionais (cartógrafos) e instituições vocacionadas para as actividades cartográficas e hoje mais acessível a qualquer pessoa, munida de meios tecnológicos mínimos[2]" (Dias, 2007, p. 37). These changes altered cartographic production and were reflected in the statement of responsibility associated with cartographic resources, showing that the work of cataloguing should consider the context in which the resource was produced.

Before the nineteenth century in Europe there were two basic types of information sources: surveys made in the field or maps made by others. While surveying, carried out by surveyors and topographers or military and civilian engineers, demanded accurate theoretical and practical preparation, compilation from existing maps was also a difficult task, involving selecting and matching information from various cartographic sources held in the office. Some of the engineers, who were accustomed to taking measurements in the field using surveying instruments and to drawing terrain accurately to scale, developed into " géographes de cabinet", that is, compilers and even engravers or publishers of maps. They began to devote themselves to commercial cartography and the map trade. However, other map compilers did not have any training in field surveying.

Tomás López, geographer to the king of Spain in the late eighteenth century and compiler, editor and publisher, compared these two types of map production in his *Principios geográficos aplicados al uso de los mapas*: "El Geógrafo trabaja en su casa, teniendo a la vista papeles varios de un mismo terreno, que compara, y adapta lo que segundo su buena crítica es mas perfecto. No es ministerio suyo levantar planos particulares, porque para esto hay otra clase de gentes, que no necesita mayor instrucción, que la de llegar a saber hasta la Geometría rectilínea. Si los Geógrafos necessitaran ver y medir la tierra, que compreende sus Mapas, ninguno hubiera podido durante su vida publicar una de las quatro partes de la tierra[3]" (Garcia & Moreira, 2008, p. 122). "Assim, à semelhança de muitos outros geógrafos, cartógrafos e editores europeus, López elabora os seus mapas pelo somatório, confrontação e síntese de descrições geográficas e corográficas, e de mapas de escalas e tipos diversos, a denominada Cartografia de gabinete. A 'otra clase de gente' são os engenheiros, particularmente os militares, que representam os "modernos", e que defendem uma Cartografia com base no estabelecimento de triangulações e em levantamentos topográficos[4]" (ibid.).

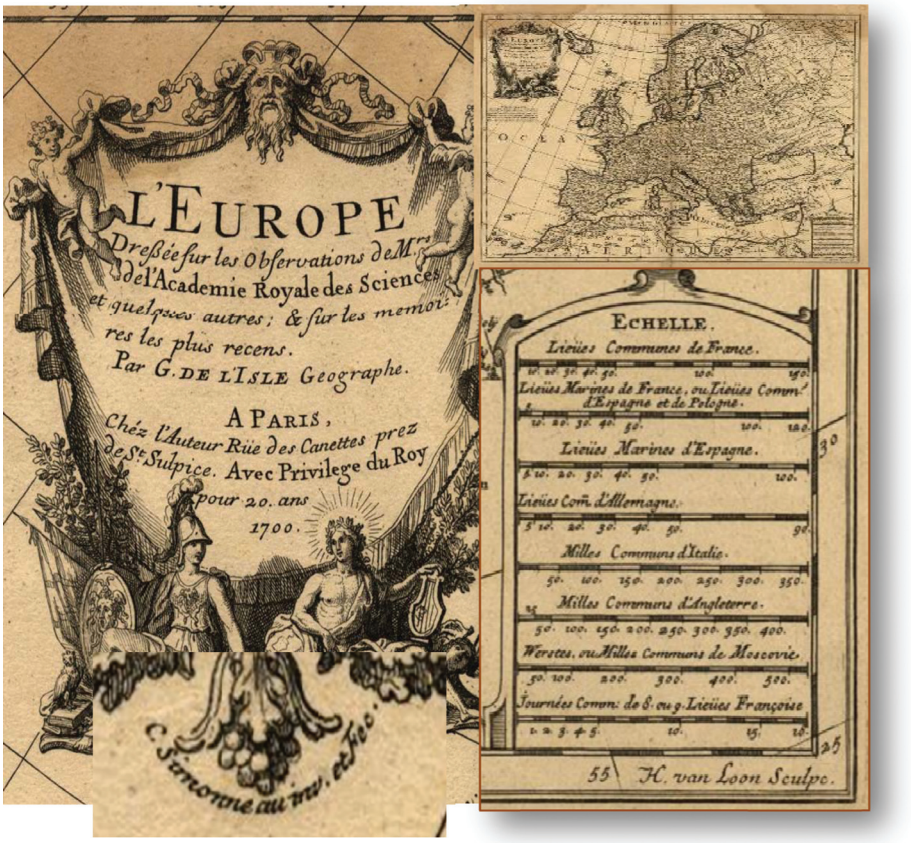
Maps of that period often bear notes saying that they were based on field observations. These were intended to attest the truth of their authorship and their up-to-date content, because manuscript and printed maps could be copied exactly or with minor changes by any compiler or "géographe de cabinet". On the other hand, some map compilations skilfully combined literary sources and graphics from different time periods. The "géographe de cabinet" looked for commonalities or discrepancies between sources and synthesized similarities to produce homogeneous information. According to

Pedley (2005, p. 25), the compilation is "the process of reading these literary accounts, taking various manuscript plans of the same place and coordinating them by determining their scale, analyzing the measurements used by the surveyor, and redesigning the maps on a projection that could accommodate the scale of the map". Until the nineteenth century, truly unique maps, resulting from costly field surveys or difficult compilation work in the office, might or might not be printed. This decision depended on several factors, including economic ones. Generally, the map scale is closely related to the intended purpose of the map, which also determined its dissemination. Large-scale maps were intended for use in official or public administration, often remaining as manuscripts. In contrast, medium and small-scale maps covering large territories were often directed at a broad audience, which was becoming more numerous over time, and were compiled by a "geographer" and reproduced by printing for commercial distribution.

In eighteenth-century Europe there were at least two types of division of labour in map compilation and engraving. In France, the compilers were normally not engravers (e.g. Delisle, Buache, or Gilles Robert de Vaugondy). In England, though, the compilers were often engravers, and even de facto authors, as stated by Pedley (2005, p. 45): "at least it is the engraver's name that often claims authorship of a map for lack of any other". The compiler status of Guillaume Delisle (1675–1726) is proven by information contained in the title of his own map of Europe (Figure 1). The map also reveals that the engraving work was not done by Delisle, who employed several engravers, each with a specific function (engraving the map borders, the water features, the topographical details, the lettering and the ornamental cartouche).

It was the publisher (English) or "éditeur" (French) who played the leading role in the production and dissemination of maps and atlases to the general public for the simple reason that he was the owner of capital. The involvement of publisher in cartography was expressed in "contrats entre les éditeurs, les cartographes et les graveurs; des procès pour des plagiats ou du travail mal fait; des actes de vende de matériel d'impression, de planches gravées ou de fonds géographiques entiers" (Pastoureau, 1980, p. 452). In many cases, even though they had training as engravers, they would devote themselves exclusively to the commercial side of the business. Some of these map publishers even held the title "Ordinary Geographer of the King", incorrectly suggesting that they had responsibility for the intellectual work of map compilation (Pastoureau, 1980, p. 452).

*Fig. 1: Map of Europe compiled by Guillaume Delisle, dated 1700, and extracts showing the title and the area of graphic scales, indicating the various contributors: Royal Academy of Sciences, H. van Loon and C. Simonne (Source: National Library of Portugal).*




This brief description of some aspects of map production before the nineteenth century illustrates the challenges faced by cataloguers trying to identify the person(s) responsible for the content of cartographic resources from earlier time periods. In summary, regarding the assignment by the cataloguer of primary responsibility for maps, it is possible to identify two categories in eighteenth-century European map production: those who produce maps from field surveys — topographers, surveyors, geographers and engineers — and those who start from written or graphic records of others — compilers or

geographers of cabinet. Nowadays the generic designation of cartographers is attributed to both. Thus, whenever they are clearly identified, they should be considered as the main access point to the document. Among the remaining participants in map production, the draftsmen and engravers should be recorded with a secondary statement of responsibility by the map cataloguer. Publishers and printers should be confined to fields for publication and distribution; users searching the catalogue will be able to retrieve them through those access points.

In regard to old maps (Andrew & Larsgaard, 1999), the general recommendation is to transcribe into their bibliographic records not only all the statements of responsibility, but also all the other production and publication information that appears on them. As well as the difficulty of correct treatment of authorship when cataloguing old maps, there is the problem of hard-to-identify copying and counterfeiting of maps. The proliferation of counterfeit maps was due to the difficulty and expense of survey and compilation. Engravers, printers and booksellers, particularly during the seventeenth and eighteenth centuries, copied the maps of others or printed maps from engraved plates that they had acquired. Plagiarism was not even limited to the borders of the country, since foreign maps were easily copied. In order to make people believe that the map was an original compilation, indications were added to the statement of responsibility which referred to various credits, such as "amended and corrected from" or "improved from the map of".

To mask copies, printers, publishers and booksellers used the work of their engravers. They introduced decorative elements, fonts or symbols and even different scripts and dedications. The title of the map was often used to claim authorship and to clarify any doubt, by mentioning the names of all the people involved in its production, even with secondary responsibilities. The name of the person who ordered the work and who directed and executed the surveys helped to give even greater credibility to the work. In this way they affirmed that its preparation was based on surveys, removing the suspicions of forgery and making a new product using content which sometimes was more than a century old.

In the eighteenth century, printed maps were produced in a complex context: "The printed maps trace its source to a manuscript map that incorporated observations of space; these observations resulted from physical effort, such

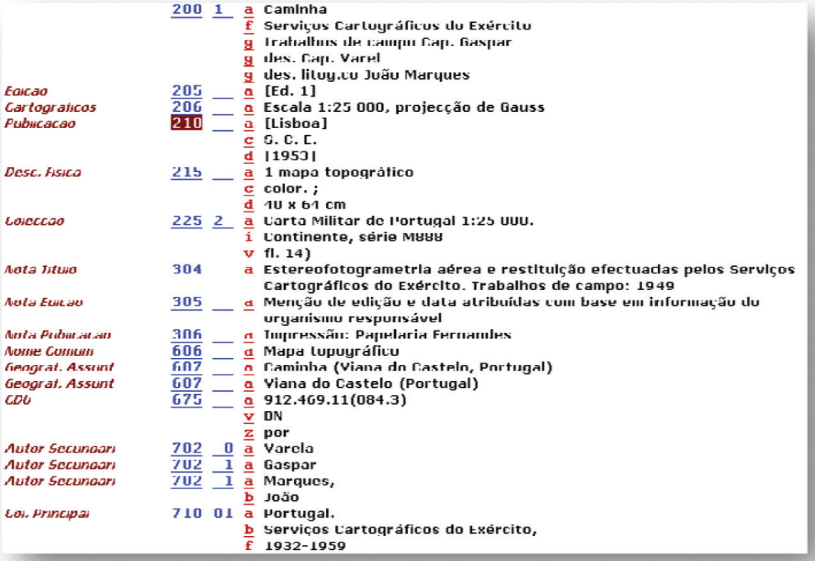
as a survey, or intellectual effort, such as compiled map, or a combination of both. The manuscript map may be copied, enlarged, or reduced, its information removed, altered, or expanded several times over before a version of it (or several different versions of it) is engraved on copperplate, ready for printing. Thus the information embodied by a printed map has already been distilled several times before engraving, a process that itself alters the content of the map" (Pedley, 2005, p. 198). Even after publication, the maps were still "copied and reprinted for different purposes, for different audiences, by different authorities, further transforming its contents, with different results for its users" (Ibid.).

In conclusion, for a cartographic resource there are many factors of responsibility, and we can categorize them further as follows: topographer, surveyor or whoever stood on the field in the case of topographic maps, hydrographic charts, etc.; compiler; draftsman; engraver; and, finally, the person responsible for a work in which the map is integrated (for example, maps inserted in an atlas or another publication).

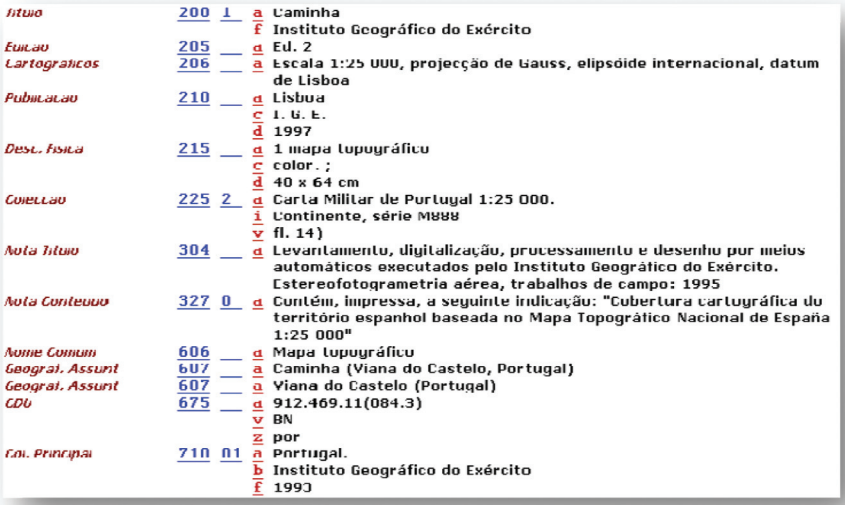
## 2. Identification and seriation of authors in bibliographic descriptions

Maps, like books, may be the result of individual or collective, personal or institutional work. In general, in the most recent cartographic resources individual authorship, even institutionally framed, is often explicitly mentioned. However, if it involves production organisations, authorship entered in the document refers almost exclusively to the organization and less often to the individual contributions of each contributor (though half a century ago this was not the general situation). Thus, in large part, the individual statement of authorship usually appears today associated only with thematic maps. In hydrographic and topographic cartography, on the other hand, the inscription on the documents generally refers only to the institution or official body responsible for producing the country information and keeping it up-to-date. The *Carta militar de Portugal 1:25,000* (1928 –), from the Instituto Geográfico do Exército, is a good example of the evolution in the expression of individual and corporate authorities: the first sheets published contain not only the producing institution, but they also reference some contributions of individuals: drafting, lithography, updating, etc.., which later disappeared (Figure 2).

*Fig. 2: Extracts from the bibliographic records of two editions of a sheet of the Carta Militar de Portugal 1:25,000, containing some explicit statements of authorship (extracted from: http://mapoteca.igot.ul.pt/).*



| | | | | |
|---|---|---|---|---|
| | 200 | 1 | a | Caminha |
| | | | f | Serviços Cartográficos do Exército |
| | | | g | Trabalhos de campo Cap. Gaspar |
| | | | g | des. Cap. Varel |
| | | | g | des. litog.to João Marques |
| Edicao | 205 | | a | [Ed. 1] |
| Cartograficos | 206 | | a | Escala 1:25 000, projecção de Gauss |
| Publicacao | 210 | | a | [Lisboa] |
| | | | c | S. C. E. |
| | | | d | [1950] |
| Desc. Fisica | 215 | | a | 1 mapa topográfico |
| | | | c | color. ; |
| | | | d | 40 x 64 cm |
| Colecção | 225 | 2 | a | Carta Militar de Portugal 1:25 000. |
| | | | i | Continente, série M888 |
| | | | v | fl. 14) |
| Nota Titulo | 304 | | a | Estereofotogrametria aérea e restituição efectuadas pelos Serviços Cartográficos do Exército. Trabalhos de campo: 1949 |
| Nota Edicao | 305 | | a | Menção de edição e data atribuídas com base em informação do organismo responsável |
| Nota Publicacao | 306 | | a | Impressão: Papelaria Fernandes |
| Nome Comum | 606 | | a | Mapa topográfico |
| Geograf. Assunt | 607 | | a | Caminha (Viana do Castelo, Portugal) |
| Geograf. Assunt | 607 | | a | Viana do Castelo (Portugal) |
| CDU | 675 | | a | 912.469.11(084.3) |
| | | | v | BN |
| | | | z | por |
| Autor Secundari | 702 | 0 | a | Varela |
| Autor Secundari | 702 | 1 | a | Gaspar |
| Autor Secundari | 702 | 1 | a | Marques, |
| | | | b | João |
| Ed. Principal | 710 | 01 | a | Portugal. |
| | | | b | Serviços Cartográficos do Exército, |
| | | | f | 1932-1959 |



| | | | | |
|---|---|---|---|---|
| Titulo | 200 | 1 | a | Caminha |
| | | | f | Instituto Geográfico do Exército |
| Edicao | 205 | | a | Ed. 2 |
| Cartograficos | 206 | | a | Escala 1:25 000, projecção de Gauss, elipsóide internacional, datum de Lisboa |
| Publicacao | 210 | | a | Lisboa |
| | | | c | I. G. E. |
| | | | d | 1997 |
| Desc. Fisica | 215 | | a | 1 mapa topográfico |
| | | | c | color. ; |
| | | | d | 40 x 64 cm |
| Colecção | 225 | 2 | a | Carta Militar de Portugal 1:25 000. |
| | | | i | Continente, série M888 |
| | | | v | fl. 14) |
| Nota Titulo | 304 | | a | Levantamento, digitalização, processamento e desenho por meios automáticos executados pelo Instituto Geográfico do Exército. Estereofotogrametria aérea, trabalhos de campo: 1995 |
| Nota Conteudo | 327 | 0 | a | Contém, impressa, a seguinte indicação: "Cobertura cartográfica do território espanhol baseada no Mapa Topográfico Nacional de España 1:25 000" |
| Nome Comum | 606 | | a | Mapa topográfico |
| Geograf. Assunt | 607 | | a | Caminha (Viana do Castelo, Portugal) |
| Geograf. Assunt | 607 | | a | Viana do Castelo (Portugal) |
| CDU | 675 | | a | 912.469.11(084.3) |
| | | | v | BN |
| | | | z | por |
| Ed. Principal | 710 | 01 | a | Portugal. |
| | | | b | Instituto Geográfico do Exército |
| | | | f | 1993 |

Despite the large number of maps currently being produced by institutions, the references to individual responsibility cannot be ignored or eliminated. Some map librarians, including American ones, believe that: "when a personal author is given, it should be used as main entry" (Rockwell, 1999, p. 43), whereas others claim that also for maps produced by an institution, but containing expressions as 'charted by ....', 'designed by ...' or 'compiled by ...', the person linked to such an expression should be considered as the individual author and the main entry to the document.

The selection of the person who has the greatest responsibility for the work and who should head the catalogue record is not a simple task. The lack of clear rules and clarifying examples allows technicians to choose questionable procedures without uniformity. When there is an identified producing institution and, in parallel, there is individual participation, there are some who use as a criterion for decision making the way in which the statements in the document are presented: if the largest contributions are from individuals, one of them should be the main entry of the register, with the institution being recorded as secondary (and vice versa). However, as is easily noted in the examples in Figure 2, this rule will rarely give the attribution of primary responsibility to the individual authors. The cartographic institutions fulfil today almost all functions simultaneously: the author (in his various tasks), the editor and even the printer or distributor.

Another example is provided by contemporary thematic maps, including geological or agricultural maps. In the first case, besides mentioning the public body for which the map is produced, the sheets still discriminate against those responsible for the field survey and the source of the cartographic base. This leads us to the question whether the authorship should not be given to the geologists who collected and interpreted the information so that the institution will only assume responsibility for editing. In these cases, according to some experts, there are only two possibilities: to consider the institution as principal author and assign a secondary entry to the geologist or vice versa. It is possible to give those that are responsible for base maps a secondary role, but the practice in many national and international map libraries is that they are only mentioned in the notes.

Regarding thematic cartography, it is also important to consider the effects those modern digital technologies for the construction of easily accessible and user friendly maps have had on the statements of responsibility associated

with this type of map. The professionals provided with these tools and support on the Internet have become largely self-sufficient. Today, one professional can carry out the entire chain of production and, institutionally framed or not, will have full responsibility for the map produced. The responsibility of editing remains with the institutions for which they work, or with which they collaborate. The producers of basic geographic information and institutions that provide additional data for the preparation of such maps will continue to be assigned to the function of information sources, mentioned or not in the field of notes according to the documental policy established by each library.

The existence of multiple indications of authorship, associated or not with different functions in a given cartographic resource, leads inevitably to doubts about which of them is considered the principal entry. It is not easy to establish general rules, as it is hard to find stable criteria that support decision making about the various functions of the cartographic production chain, the enormous diversity of situations over the centuries and the nature and complexity of this information: "each map or map set being cataloged must be taken on a case by case" (Rockwell, 1999, p. 43).

## 3. Constraints and solutions in the application of relator codes

The previous discussion about the clarification of the contributors in the complex production chain of cartographic resources leads inevitably to the question of attribution of relator codes to the different contributors responsible for the content of the maps, using the table published in the *UNIMARC manual*: bibliographic format (IFLA, 2008b, Appendix C).

In a general analysis, based on experience in the cataloguing treatment of cartographic resources, we have concluded that some codes suffer from being too general and others too specific (Table I). This is the case of "cartographer" (code 180), without discrimination of the scope in *IFLA Universal Bibliographic Control and International MARC Core Programme* (IFLA, 1994a, Appendix C), which in practice has been used to describe very different roles (drawer, cartographer, compiler or geographer, surveyor, and even map editor) in documents of different periods of the history of cartography. In contrast, multiple codes can be assigned to the engraver — engraver, etcher, etc… (350, 360, 510, 530 and 760) —, distinguishing, after all, processes that, in order to

*Table I: Some relator codes in UNIMARC: bibliographic format (based on the Portuguese edition, 2008) and its use recommended or questionable in cartographic resources.*

| Code | Function | Application | Use in cartographic resources |
|---|---|---|---|
| 000 | Undetermined function | A person or organization with responsibility undetermined. Used when it is necessary to clarify that an attempt was made, unsuccessfully, to determine the type of responsibility. | While better avoided, this code may be used. |
| 020 | Annotator | Writer of manuscript annotations in a printed book. | Responsible for handwritten notes to the document, be it handwritten or printed. |
| 050 | Assignee | Person or organization to which a license for printing or publishing has been transferred. | Person or institution responsible for editing. |
| 070 | Author<br>Co-author | Person or corporate body chiefly responsible for the creation of the intellectual or artistic content of a work. When more than one person or body jointly bears such responsibility, this code may be used in association with as many headings as is appropriate. | Commonly used for authors with different functions, ranging from those who coordinate, compile, edit, or even draw the map. It is recommended to be replaced by specific relator codes, which best describe the responsibility of each of the production processes. |
| 100 | Bibliographic antecedent | One who is the author of the work upon which the work reflected in the catalogue record is based in whole or in part. This relator may be appropriate in records for adaptations, indexes, continuations and sequels by different authors, concordances, etc. | Sometimes used for the author of the map on which the present document is based, but not always to be recorded in 7--. |
| 130 | Book designer | Person or corporate body responsible for the entire graphic design of a book, including arrangement of type and illustration, choice of materials, and process to be used. | Sometimes improperly used for the designer. We recommend its use for the coordinator of the technical work of vectorization and digital processing. |
| 180 | Cartographer | (Without explicit application) | Function vague, difficult to apply in many cases, designating one who executed the map. Generally attributed both to those who did the surveys or compilations, such as who directs, or draws sketches. |

Table I continued

| Code | Function | Application | Use in cartographic resources |
|---|---|---|---|
| 205 | Collaborator | Use only when a more precise function, represented by another code, cannot be used. | Should be used when referring to someone who assists the work of others, exercising a function similar to this. Sometimes improperly used for who raises the map (such as "employee" of the director or coordinator, who directs). |
| 206 | Responsible for the collection of field material | Used to person who collect, in the field, elements of musical tradition, oral or naturally related to a particular territory, population or species, transcription, or sound recording or audiovisual. | Should be used for those who perform topographic work or who, somehow, collect information in the field, whatever its nature. It is not generally employed, it is preferred to use the function |
| 220 | Compiler | One who produces a collection by selecting and putting together matter from works of various persons or corporate body. Also, one who selects and puts together in one publication matter from the works of one person or body. | One who produces a cartographic document from diverse information, cartographic or not, who brings together and systematizes. It is not generally employed, it is preferred to use 180. |
| 300 | Director | Person responsible for the general management of the work or who supervised the production of the performance for stage, screen, or sound recording. | Person who by reason of his functions is responsible for the cartographic document or the one who coordinates or directs the staff. |
| 340 | Editor (USED BY: coordinator) | One who prepares for publication a work not his own. The editorial work may be either technical or intellectual. | **Cartographic Editor:** the one who prepares, technically or intellectually, who edits a document that is not of their/ his own. Often used improperly, either to the coordinator or to who runs the surveys. |
| 350 | Engraver (USED BY: engraving needle, engraver music and text) | (Without explicit application) | To be used when the statement is generic and when there is no information to select 360, 510, 530, or 760. |

Table I continued

| Code | Function | Application | Use in cartographic resources |
|---|---|---|---|
| 360 | Etcher | See Code 350 | |
| 400 | Funder (obsolete) | USE SPONSOR (723) | Sometimes used, although it is debatable. |
| 410 | Graphic technician | USED BY: colorist, graphic designer, designer, printer of photographs and computerized technical drawing. Used for the person responsible for conducting original graphic design (not including those who conceives, the illustrator, code 440). | Includes cartographer-draftsman (or cartographic draftsman) and computerized technical drafting (although these should be separate functions and descriptions that best reflect the activities). |
| 475 | Corporate body editor | Corporate body under whose auspices the bibliographic resource may be published. It may be or not the intellectually community responsible for the resource, and whether or not the publisher of the same trade. | Could fit only to institutions that edit the individual works. |
| 490 | Licensee | Original recipient of right to print or publish. | Could be applied to cartographic publishers that, until the nineteenth century, obtained from the king the privilege of printing. For modern cartography this could be applied to the commercial publisher, or institution that holds the license for copyright. |
| 510 | Lithographer | Person who prepares the stone or grained plate for lithographic printing, including a graphic artist creating an original design while working directly on the surface from which printing will be done. | One who creates the original design on the lithographic stone, from which the reproduction was made. Frequently used in conjunction with 360 |
| 530 | Metal-engraver | See Code 350 | |
| 610 | Printer | Printer of texts, whether from type or plates (e.g. stereotype). | Whoever reproduces, usually on paper, the document, regardless of the process that led to the original matrix. The printer is not always recovered in 7 -. Also used for the engraver/printer. |

Table I continued

| Code | Function | Application | Use in cartographic resources |
|---|---|---|---|
| 640 | Proof-reader | Corrector of printed matter only; for manuscripts use Corrector (270). | Can adapt to whoever conducts a graphics review and quality control. |
| 700 | Copier – USe Scribe | Person who copies manually printed documents, and also an amanuensis or a writer of manuscripts proper | Could be used for cartographer-draftsman, where it is known that he just copied an existing document. |
| 720 | Signer | Use for signature which appears in a book without a presentation or other statement indicative of provenance. | Could be used when there is a handwritten signature on the printed document or, if the document is handwritten, it does not correspond to the author or drawer. |
| 760 | Wood-engraver | See Code 350 | |
| 770 | Writer of accompanying material | Writer of significant material which accompanies a sound recording or other audiovisual material. | Should apply to authors of explanations, memoirs, information or notes, together with other codes whenever there was an intervention in the cartographic document (and the record is single). |

be properly identified, require technical expertise that is difficult to guarantee in most of the libraries or map libraries.

In the case of cartographic resources, in contrast, the authors and co-authors should be followed by identifying specific functions, omitting the vague code 070. In some cases it happens that, in a document that distinguishes various contributors with different roles, none of them is considered to be the author. Assigning functions to the access points should allow credit to be given to those who perform these functions, whether as the primary or secondary author, and should not exacerbate the confusing issues related to serialization of statements of responsibility in bibliographic records and in the corresponding authority records.

To show that the functions discriminated in UNIMARC should be modified, such that these types of resources can be applied unambiguously, the most frequently used ones have been selected and their application discussed in Table I. The codes chosen to appear in the table are a reflection of the practice of the cataloguing of cartographic resources produced in different periods. On the one hand this shows the inadequacy of some codes and procedures involved in the production of maps until the advent of digital mapping, on the other hand it advances the possibility of adapting some of these codes to the current production, based on new technologies.

In regard to cartographic resources earlier than the nineteenth century, a good example of the contradictory information that can be generated through the attribution of the degree of responsibility and relator codes to access points of a document is the way in which William Faden (1749–1836) appears to be identified: in the databases there are different functions assigned to him, and also their level of intellectual responsibility is different, even when the documents contain statements like "published by W. Faden" or "engraved and published by William Faden" (Table II). Since he was primarily a trader of maps, the allocation to him of primary responsibility in some documents or the choice of relator codes (360, 530 and 650, the selected examples) is disputable.

Apart from the generic codes listed at the beginning of this analysis, contemporary cartography does not raise insurmountable problems in using the existing codes. After applying some adaptations, it should be possible to use the codes defined in the *UNIMARC manual*. The analysis of some topographic

*Table II: Degree of responsibility and functions attributed to William Faden in some records from the National Library of Portugal (BNP) and the National Library of Spain (BNE)*

| Abbreviated bibliographic description | Intellectual Responsibility Block and attributed relator codes BNP | Intellectual Responsibility Block without relator codes BNE | Information about the responsibility placed on the map |
|---|---|---|---|
| Spain and Portugal divided into their respective kingdoms and provinces, from the Spanish and Portuguese Provincial maps/published by W. Faden, Geographer to His Majesty and to H. R. H. the Prince of Wales. – London : W. Faden, [1796]. | 700 $aFaden,$bWilliam, $f1749-1836 | 700 $aFaden,$bWilliam, $f1749-1836 | Published by W. Faden, Geographer to His Majesty and to H. R. H. the Prince of Wales<br>Pub.[d] by W. Faden, Feb. 17, 1795 |
| A new chart of the North coast of Brazil from Seara to the Island of Sn. João Baptista/surveyed by order of the Portuguese government ; Joze Patriceo, Pilot. – London : W. Faden, Geographer to His Majesty, and to His Royal Highness the Prince of Wales, 1809. | 700 $aPatrício,$bJosé,$ffl. 1809<br>702 $aFaden,$bWilliam,$f1749-1836$4650 | | Surveyed by order of the Portuguese Government Joze Patriceo, Pilot<br>London: Published by W. Faden, Geographer to His Majesty and to His Royal Highness the Prince of Wales. Charing Cross June 4.[th] 1809. |
| A topographical map of the isle of Minorca... / by L. S. de la Rochette ; grav. William Faden. – London : William Faden, 1780. | 700 $aDelarochete,$bLouis Stanislas d'Arcy,$f1731-1802<br>702 $aFaden,$bWilliam,$f1749-1836$4360 | 700 $aDelarochete,$bLouis Stanislas d'Arcy, $f1731-1802<br>700 $aFaden,$bWilliam, $f1749-1836 | Geometrically Surveyed by the Royal Engineers, while it remained in the possession of the French during the Last War, and digested by L. S. de la Rochette<br>Engraved and published by William Faden, Charing Cross as the Act directs Jan.[y] 1.[st] 1780 |

Table II continued

| Abbreviated bibliographic description | Intellectual Responsibility Block and attributed relator codes BNP | Intellectual Responsibility Block without relator codes BNE | Information about the responsibility placed on the map |
|---|---|---|---|
| A chart of the coasts of Spain and Portugal with the Balearie Islands and part of the coast of Barbary/ by L. S. De La Rochete ; engraved and published as the Act directs by William Faden. – London : William Faden, August 30th 1779. | 700 $aDelarochete,$bLouis Stanislas d'Arcy,$f1731-1802<br>702 $aFaden,$bWilliam, $f1749-1836$4530 | 700 $aDelarochete,$bLouis Stanislas d'Arcy,$f1731-1802<br>700 $aFaden,$bWilliam, $f1749-1836 | by L. S. de la Rochette<br>Engraved & published as the Act directs, by W.m Faden, success.r to the late T. Jefferys, Geog.r to the King. Charing Cross, August 30.th 1779. |
| Chart of the entrance of the river Tagus/surveyed in 1806 by William Chapman, Master of the Royal Navy ; writing by T. Harmer ; published by W[illia]m Faden, Geographer to His Majesty and to His Royal Highness the Prince of Wales ; H. Wilson sculpt. – London : W[illia]m Faden,12th August, 1807. | 700 $aChapman,$bWilliam, $f1749-1832<br>702 $aFaden,$bWilliam, $f1749-1836$4650<br>702 $aHarmer,$bThomas, $ffl. 1784-1814$4530<br>702 $aHarmer,$bThomas, $ffl. 1784-1814$4530<br>702 $aWilson,$bH., $ffl. ca 1807$4530 | | Surveyed in 1806 by William Chapman, Master of the Royal Navy.<br>Published by W.m Faden, Geographer to his Majesty and to his Royal Highness the Prince of Wales, Charing Cross, August 12.th 1807.<br>Writing by T. Harmar<br>H. Wilson sculpsit. |

and thematic maps produced in Portugal with the use of digital tools (Figure 3) shows that new functions — inherent to electronic processes — are being added to the traditional ones. Examples are: "scanning, processing and design by automated means" or the indication of specific tools of Geographic Information Systems (GIS), associated with terms of responsibility for the coordination, processing and review procedures that were used. Thus, contrary to the old maps, the application of relator codes does not seem to raise issues that are sufficiently relevant to require the need for a complete restructuring of the codes.

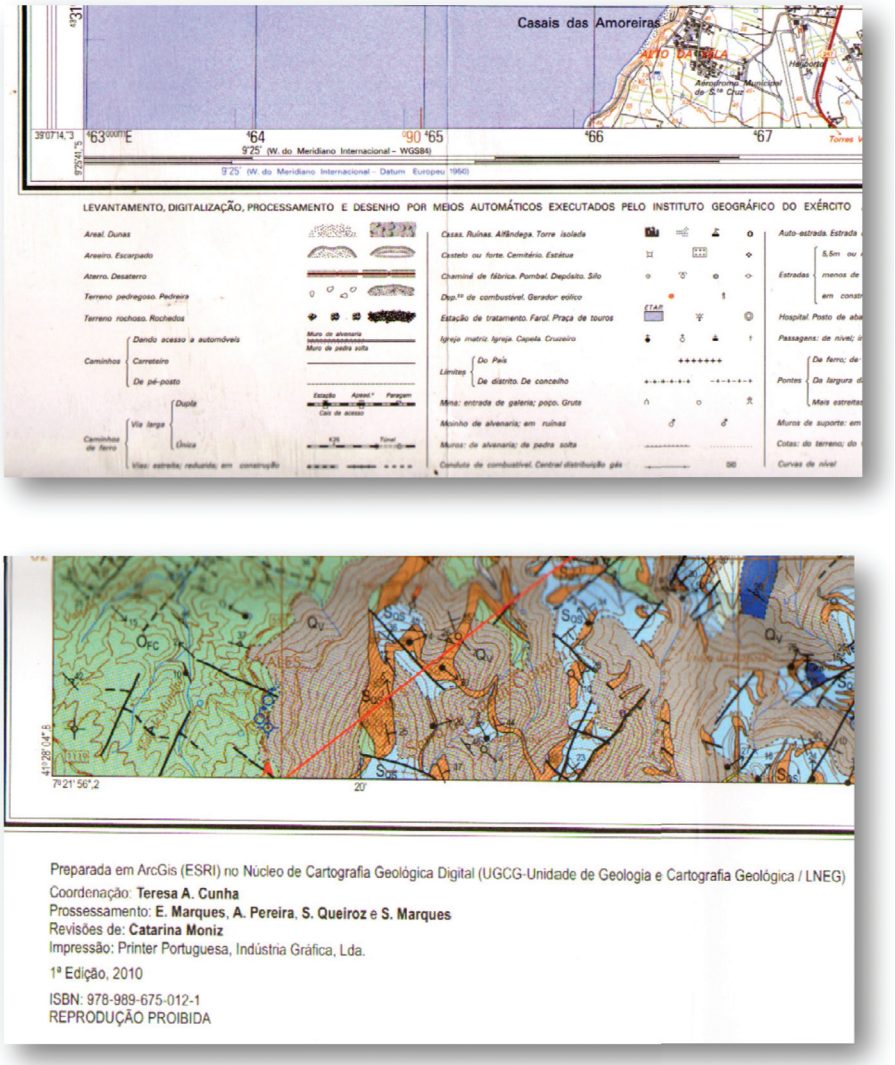
The potential of the application of these codes for cataloguing systems management (documentation) and for its users (added value for the retrieval and use of information) is important to consider when examining the related technical issues. An enquiry was made among non-specialist users of Portuguese cataloguing systems about the potential of properly applied relator codes for the efficient management and retrieval of information. The responses show that they consider them to be useful for producing bibliographical lists of a given author (a physical person or an organization), with a differentiation by his intellectual responsibility in the work.

The analysis of this aspect in some national and international bibliographic databases, with regard to cartographic resources, also demonstrates some problems in filling out this subfield, as exemplified in the records extracted from the British and French national libraries (Table III). In these records the problem of identifying and selecting the principal author, the co-authors and the secondary statements of responsibility is well illustrated, because all contributions were recorded in the same field 7, even though each of them has played a different role. Also, different relator codes (650 and 070) were attributed to the same author, in spite of the fact that his contribution (editor) for the two maps had been identical.

The example of the British Library, where the relator codes do not seem to be used, allows us to confirm the low value associated with this information and, therefore, to question the continuation of its mandatory use in most Portuguese cataloguing systems despite the optional nature allowed by the format.

For users of cartographic documents, the importance of the information about the nature of the contribution of a particular author to the contents of a map

*Fig. 3: Examples of indication of the statement of responsibility and associated functions in recent maps: Carta militar de Portugal 1:25,000 from Instituto Geográfico do Exército (above) and Carta geológica de Portugal 1:50,000 from Laboratório Nacional de Geologia (below).*




depends on the knowledge that these users possess. For those mainly interested in the geographic content, some maps may be used to study the evolution of cartography as a science, and their authors may be related to periods

*Table III: Records extracted from the National Library of France (BNF) and the British Library (BL).*

**NATIONAL LIBRARY OF FRANCE**

2001 $aA plan of the city and environs of Philadelpia$bDocument cartographique$fsurvey'd by N. Scull and G. Heap$gengraved by Will. Faden
210 $a[London]$cFaden$d[1777]
300 $aCarte numérisée à la Library of Congress
300
$ahttp://hdl.loc.gov/loc.gmd/g3300m.gar00002
607 $315238447$aPhiladelphie (Pennsylvanie, États-Unis)$2AFNOR NF Z 44-081
608 $aCarte$2frTCP
660 $an-us-pa
702 |$315150659$aScull$bNicholas$f17..-17..?$ccartographe$4180
702 |$315138256$aHeap$bGeorge$f17..-17..?$cgéographe$4180
702 |$315615346$aFaden$bWilliam$f1749-1836$4350
702 |$315615346$aFaden$bWilliam$f1749-1836$4650

2001 $aA Plan of the town of Newport in Rhode Island$bDocument cartographique$fsurveyed by Charles Blaskowitz$gpublished by W. Faden, 1777
210 $a[S.l.]$c[s.n.]$d[1887]
300 $aT. VI. 2, p. 597 de Winsor
607 $315239401$aNewport (Rhode Island, États-Unis)$315231655$z1777$2AFNOR NF Z 44-081
608 $aCarte$2frTCP
660 $an-us-ri
702 |$315129949$aBlaskowitz$bCharles$f1760-1823$4070
702 |$315615346$aFaden$bWilliam$f1749-1836$4070
702 |$312192902$aWinsor$bJustin$f1831-1897$4070

**BRITISH LIBRARY**

| | |
|---|---|
| **24512** | \|a A map of the British Colonies in North America, with the roads, distances, limits and extent of the settlements ... inscribed to ... the Earl of Halifax [with] The British Colonies in North America, engraved by William Faden, 1777 / \|c John Mitchell. |
| **250** | \|a [4th ed] |
| **255** | \|a Scale [ca. 1:2 000 000]. English miles 200 [= 165mm]. |
| **260** | \|a London : \|b Publish'd by the author Feb.ry 13.th 1755 according to Act of Parliament : \|b Printed for Jefferys & Faden Geographers to the King at the corner of St. Martin's Lane Charing Cross London, \|c [17--?] |
| **300** | \|a 1 map on 8 sheets : \|b some hand col ; \|c each sheet, 49 x 64cm. |
| **7001** | \|a Kitchin, Thomas. |
| **7001** | \|a Jefferys, Thomas. |
| **7001** | \|a Faden, William. |

and events that marked the history of a territory. Such information would therefore certainly be useful for them, but the information given to them not only not acknowledges the institutions, but also contributes to notable errors in this area.

This being the case, it may not be worthwhile using this information, taking into account the difficulty of the assignment based on the table below and the insignificant purposes and results that apparently are expected to be obtained, unless a restructuring is carried out in accordance with cartographic resources that seem to have been forgotten in the preparation of the list integrated in the *UNIMARC Manual*.

## 4. Conclusion

This analysis concludes that a proper treatment of the authors associated with cartographic resources, produced at different times and using different processes, describing contributors with different roles and levels of responsibility, is one of the key pillars to ensure a more effective management of the bibliographic databases and standards of quality of information provided to the users.

The brief description given of the evolution of the cartographic production process shows that treatment of the statement of responsibility in the bibliographic description of the maps requires that cataloguers, in addition to extensive experience in the application of technical standards, have appropriate training enabling them to identify and distinguish these references.

The analysis of the role of relator codes, stipulated by the UNIMARC Manual, leads us to conclude that it is necessary to adapt these codes.

Until this happens, we suggest that the present codes, assigned in the *UNIMARC manual* on a voluntary basis, should not be used, because we believe that their implementation in the present form only contributes to increasing the number of errors that normally proliferate in the databases.

## References

Andrew, P. G., & Larsgaard, M. L. (Eds.) (1999). *Maps and related cartographic materials*: *cataloguing, classification, and bibliographic control.* New York: The Haworth Information Press.

Dias, M. H. (2007). *Cartografia temática: programa.* Lisboa: Centro de Estudos Geográficos (Geo-Ecologia, relatório n.º 6).

Domingues, S. (2010). *Os recursos cartográficos e as bases de autoridade: normas e aplicações*. Lisboa: [s.n.]. Tese de mestrado, Ciências da Documentação e Informação, Universidade de Lisboa, Faculdade de Letras.

Garcia, J. C., & Moreira, L. M. (2008). El geógrafo trabaja en su casa*:* espaços portugueses na produção cartográfica de Tomás López. *Península. Revista de Estudos Ibéricos*, *5*, 103-125. Retrieved December 5, 2012 from http://ler.letras.up.pt/uploads/ficheiros/4709.pdf.

IFLA (1994a). *UNIMARC manual: Bibliographic format.* Retrieved December 5, 2012 from http://archive.ifla.org/VI/3/p1996-1/appx-c.htm.

IFLA (2008b). *UNIMARC manual: Bibliographic format*. Ed. by Hopkinson, A., 3d ed. München: Saur.

Pastoureau, M. (1980). Les livres et les murs. In *Cartes et figures de la terre* (pp. 436–454). Paris: Centre Georges Pompidou, Centre de création industrielle.

Pedley, M. S. (2005). *The commerce of cartography: making and marketing maps in eighteenth-century France and England.* Chicago: The University of Chicago Press.

Rockwell, K. (1999). Problem areas in the descriptive cataloging of sheet maps. In P. G. Andrew, & M. L. Larsgaard (Eds.), *Maps and related cartographic materials: cataloguing, classification, and bibliographic control* (pp. 39–63). New York: The Haworth Information Press. Also: *Cataloging & Classification Quarterly, 27,* 39–63. doi: 10.1300/J104v27n01_03.

## Notes

[1] This paper incorporates part of the research carried out for the Master Degree in Library and Information Sciences (see: Domingues, 2010).

[2] "Changed from handmade production (or analog) to production based on computer means (or digital) and, consequently, from paper maps to digital maps", as well as, "production, before, almost exclusively centered in professionals (cartographers) and institutions concerning cartographic activities and nowadays more accessible to anyone with minimum technological means".

[3] "The geographer works at home, having at hand several documents of the same area, which he compares and adapts according to what in his opinion is the most perfect reproduction. His job is not to produce specific maps, because for that there is another "class of people", who do not need any special training apart from knowing rectilinear geometry. If geographers would need to see and measure the area shown by their maps, none would have been able to publish in his lifetime one of the four parts of the earth."

[4] "So, like many other geographers, cartographers and European publishers, Lopez prepares his maps by combination, confrontation and synthesis of the chorographical and geographical descriptions and maps of different scales and types, the so-called office Cartography. The 'other class of people' are the engineers, particularly the military, who represent the 'modern' ones, and who defend maps based on the establishment of triangulation and surveying".