The Mesoamerican codex re-entangled : production, use, and re-use of precolonial documents
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5. Reproduction of the Codices

The number of precolonial codices known to exist today is very small. As seen in the previous chapters, the reason for this is threefold: the material of which the codices are composed makes them susceptible to damage; codices were not meant to be kept indefinitely; and an active extirpation campaign by the Spanish conquerors effectively wiped the writing system out. Because of their rarity and the fact that they are spread thin over a dozen institutes mostly in Europe (see Table 1 in the introduction), these books have long been rather isolated from one another and from particular groups of researchers. Consequently, a better understanding of them required, as M. D. Coe (1992, p. 90) suggests, a correct reproduction. Such a reproductive process allows for a comparison of multiple texts not held at one place, and also allows for multiple persons to study the texts at one and the same time. Without faithful reproduction, these books would still be isolated curiosities in the institutes that hold them. In other words, without reproduction there would be no corpus of precolonial codices.

The way in which the codices have been reproduced is the central topic of this chapter. Within the cultural biography of these books, their replication can be seen as essential for their present day perception and for present day ways of dealing with them. Through time the objective for making these reproductions has changed, which has had a direct impact on the techniques used to copy and disseminate them. These changes in objectives for making reproductions also reflect a change in stakeholders, as increasingly large audiences became interested in these extraordinary books. In the context of these multifaceted changes, reproduction has been essential to spread these texts to non-researchers, which has had both positive and negative effects. Although increased access may be seen as a good thing in itself, processes of commercialisation and (mis-)appropriation have the potential to completely change the nature of these works.

In this chapter, only full reproductions of codices are considered. There are three reasons for this. First of all, there are too many publications of single images or a limited set of images of the codices to be considered here. Second, many of these are simply reproductions of one of the earlier facsimile versions, and therefore do not produce any new visual material. Third and perhaps most importantly, these individual images are reproduced in isolation within a new context. In the process of isolated reproduction, the codices are reinterpreted in a new and not always transparent context, which may have resulted in an intentional or unintentional change to the meaning of the texts. Moreover, the selection of pertinent images is highly dependent upon the argument that is put forward. Showing only select pages of a document pushes the reader towards a specific interpretation of the document as a whole. For example, it is very easy to portray a vision of the Codex Yoalli-Ehecatl – and by extension of its creators – as being extremely bloody. All that is needed is the selection and presentation of specific bloody scenes, while omitting any other scenes the rest of the document. Any text which includes images – including the present work – will work in the same way through selection of images that support the argument made. This has happened with the precolonial codices from the very beginning of their rediscovery in European libraries, in which they had been more or less forgotten until the 19th century.

The fact that the codices had been largely forgotten in Europe was made clear from the very first time that copies of images from the precolonial Mesoamerican codices reached a wider audience in Europe, with the publication in 1810 of the travelling accounts of Alexander von Humboldt. These accounts, however, contained only fragments of multiple documents and were not intended to show to the public the complete extend of the Mesoamerican literature, but more to illustrate a specific point. In the case of Von Humboldt, there is a clear tension between his respect for the architectural accomplishments he

encountered during his travels through Middle- and South America and his distaste for the writing system encountered in the codices:

> *"Chez les Mexicains, la férocité des moeurs sanctionneé par un culte sanguinaire, la tyrannie excercée par les princes et les prêtres, les rêves chimériques de lástrologie et lémploi fréquent de l'éscriture symbolique, paroissent avoir singulièrement contribué à perpétuer la barbarie des arts et le goût pour des formes incorrectes et hideuses."*
> (Humboldt, 1989, p. 215)

This chapter, therefore, considers only reproductions that aim at presenting the entire document and that give the document space to explain itself, so to speak. These reproductions are not necessarily all presented in the same format as the original – and this brings in other problems considered below – but they do (aim to) give a replica of the original encoded message. Four major projects of physical reproduction can be distinguished that aimed to reproduce multiple codices in the same form: Antiquities of Mexico; the copies of the so-called Borgia group funded by the Duc de Loubat; the first series of reproduction published by ADEVA in Graz; and the series of reproduction published by the Fondo de Cultura Económica (Mexico) in collaboration with ADEVA. Besides these large projects there have been quite a number of publications of reproductions of individual codices. Of these individual reproductions, only a few are selected and used here to illustrate how and why the reproduction of codices is currently undertaken. All these reproduction were made within a specific context and the accompanying commentary as well as the physicality of the reproduction itself can give clear insight into the intended function of the reproduction itself.

Next to physical reproductions, digital technology has made it possible to disseminate imagery without a physical medium. Here, again, the objectives for image-based reproduction and dissemination differ from case to case. The internet is an almost infinite place, though the number of websites presenting complete codices is limited.

As stated above, the dissemination of imagery of the codices to the general public has had unintended side-effect. One of these side-effects is re-production of this type of book, where "re-production" is meant to denote the creation of new inauthentic originals based on the precolonial examples. Two negative examples are given of this, which show how ancient precolonial codices can come to be misused.

5.1 ANTIQUITIES OF MEXICO

The first time that all the Mexican codices – as they were known at the time – were reproduced within one format, was within the project of Edward King, better known as Lord Kingsborough, under the name of "The Antiquities of Mexico" (Kingsborough, Aglio, & Dupaix, 1831). In the first three volumes, thirteen documents were copied (see Table 6). A fourteenth document – the Paris codex – was copied though never published.

Much has been made about this Lord Kingsborough and how he supposedly "Lost his Fortune trying to prove the Maya were the Descendants of the Ten Lost Tribes", as the title of an article in the 1985 issue of the Biblical Archaeology Review reads (Goodkind, 1985). Whitmore (2009) already showed that the situation was far more nuanced than a doomed biblical quest. The family had been burdened by debt by the father and grandfather of Edward King, long before he started his project.

Reviewers at the time of its publication were of a mixed opinion about the quality of the work. For a large part this had to do with the interpretation that Kingsborough himself gave to the images. Like North American researchers talking about the 'Mound Builders", Kingsborough did not believe that the cultures making these codices could have originated in the Americas. His argument was that these cultures were part of the Lost Tribes of Israel was outmoded even in his own time. Rather than focusing on Kingsborough's interpretations, the real contribution of this work is found in the replications themselves.

Copied Document	No. of Pages
Book One	
Codex Mendoza*	73
Codex Telleriano Remensis*	93
Boturini Codex*	23
Codex Ñuu Tnoo-Ndisi Nuu (Bodley)	40
Codex Añute (Selden)	20
Selden Roll	12
Book Two	
Codex Vaticanus A*	149
Codex Mictlan (Laud)	46
Codex Tlamanalli (Cospi)	24
Codex Yuta Tnoho (Vindobonensis Mexicanus I)	65
Humboldt Fragments*	18
Book Three	
Codex Yoalli-Ehecatl (Borgia)	76
Codex Dresden	74
Codex Tezcatlipoca (Fejérvàry-Mayer)	44
Codex Tonalpouhqui (Vaticanus B)	96
Book 10**	
Paris Codex**	13?
* Colonial Document	
** Unpublished	

Table 6. Codices copied in the Antiquities of Ancient Mexico.

Whitmore (2009, 10) argues that it may have been the friendship with the bibliophile Sir Thomas Phillips that set Kingsborough on the road to his Magnum Opus (see also Graham, 1977). However, a second important impetus was the Grand Exhibit, which opened on the 8th of April 1824 in the Egyptian Hall in Piccadilly. In this exhibit, William Bullock had brought together for the first time in English history a large number of Mexican antiquities, plants, animals, minerals, and other objects (cf. Costeloe, 2006). This exhibit was made possible by a major political shift: the independence of Mexico from the Spanish crown in 1821. This political shift made Mexico much more open to foreign visitors and thus also to foreign explorers. Costeloe (2006, p. 277) argues that the exhibit by Bullock was for a large part responsible for the thousands of British people that left for Mexico in the first few years after Mexican independence. It is certain that it inspired Kingsborough and it was at the exhibit that he was introduced to Augustine Maria Aglio (see Aglio, 1853). Aglio had been commissioned by Bullock to make a number of lithographs for the promotion of the exhibit (Costeloe, 2006, p. 283), one of which was of the Codex Boturini, which was also part of the exhibit. Bullock had taken a number of documents – including the Boturini Codex – from Mexico without permission. When he returned to Mexico with his family after he sold the entire exhibit in 1825, he did however return the 'borrowed' books (Costeloe, 2006, pp. 289-290).

After having made the copies of the Boturini codex, Kingsborough commissioned Aglio to make copies of the codices in the Bodleian Library of the University of Oxford. But then, at some unknown point in time, there seems to have been a falling out between Aglio and Kingsborough. This falling out probably occurred for two reasons. The first is that in the earliest print of the Antiquities of Mexico, Aglio and not Kingsborough is mentioned as the author, and it seems that Aglio was the centre of attention when this book came out, as can be seen in a review from 1832 (Anonymous, 1832). The second reason was money. In his autobiography, Aglio laments the fact that he had always been careless about his financial wellbeing and that he regularly was cheated into working for either too little money or even for

Figure 5.1 left: Example how colour-coding letters become part of the design. Drawing with colour-coding, (©Trustees of the British Museum); middle: Kingsborough facsimile; right: detail of photographic reproduction of page 42 (Anders et al., 1993c).

free or at a loss (Aglio, 1853). At first, he seems to have trusted Kingsborough on the basis of "[…] the honour and liberality of a Nobleman"(Aglio, 1853, p. 9). But when Kingsborough died in 1837, Aglio had still not been paid.

Aglio's drawings of the codices are very precise, which is due to his way of reproducing the works. He traced the outlines of the figures using tracing paper placed directly on the surface of the document, which resulted in very accurate reproductions. The British Museum has in its collection some of the original tracing papers made by Aglio. According to the database of the British Museum,[43] Kingsborough donated these objects so that his facsimile could be compared to these drawings. He did not, however, include the papers of the codices held in English institutes, because for these objects the comparison with the original was possible. In order to save time, Aglio used two systems to record the colours. The first system was used on the small Codex Tonalpouhqui. Aglio started by drawing the outlines of the figures using tracing paper. He then used a reference system of letters to indicate specific colours (see Table 7). Since the Mesoamerican writing style does not use shading but instead colours areas in solid colour, for each field of colour enclosed with a black outline, a

Letter	Colour
bl.	blue
b.	black
v.	verditter
l.	carmine
s.	burned Siena
y.	yellow (bright)
g.	green
as.	ash colour

Table 7. Colour-coding used by Aglio and explained on the drawing of Codex Tonalpouhqui pages 49-50 green

letter within a delineated area was enough to know what colour the figure had in the original.

Although this system has the major advantage that no coloured paint or ink needs to be used, it also has three drawbacks. The first is that occasionally the letters are mistaken for parts of the design. In figure 5.1, for instance, the face of the original image does not have the curl on the cheek as found in the printed Kingsborough edition. The line-drawing of Aglio shows clearly that this is the remnant of the letter v. used as a referent to the blue colour of the face.

43. http://www.britishmuseum.org/research/collection_online/, Accessed 24-12-2015.

Figure 5.2: Comparison of the drawing of Aglio (©Trustees of the British Museum) (left), the print in Kingsborough et al. (1831) (central), and photographic reproduction of page 42 (Anders et al., 1993c) (right).

The second issue is that some letters may be confused; especially the y, s, and g in the handwriting of Aglio can be confusing. In some cases though, it is clear that the one making the colour just did not read properly, as is clear in the example given in figure 5.2, where the bottom left numeral dot is coded as l. (red) while it was eventually printed as green.

The third issue with this system is that areas that are not coloured would sometimes get a colour as they were not explicitly coded as colourless. The one filling in the colour may have interpreted the omission of a letter for the colour as a fault in Aglio's drawings, one that needed to be corrected by adding a colour to the section based on best guesses. This is also clearly visible in figure 5.2. If the original depiction of the skirt is compared with the drawing and the facsimile, it is clear that a lot of the areas that were supposed to be white have been filled in with green, blue, red, and yellow.

A second system seems to have been more extensively used by Aglio and is found on the drawings of the codex Yoalli-Ehecatl, Tlamanalli, and Yuta Tnoho held at the British Museum. On these drawings, he only partially coloured every section (see figure 5.3). Aglio seems to have been intent on copying the codex as he saw it, as well as how it had originally been. He understood, however, that there was great uniformity in the selection of colours within this writing system. His note on his tenth drawing of the Codex Yoalli-Ehecatl is very informative in this respect. He recognised that the brown colour found in the coils in the border of this image originally must have been green. This tells something about the condition of the document at that time. Aglio only gives this note on this one page, simply colouring the other areas green. Today, all areas that once were green are degenerated to a brown colour. Aglio must have seen areas that were only partly degenerated, allowing him to come to the conclusion that all these areas originally had a different colour. As such, this gives some more indications as to the speed of degradation of the colorants discussed in chapters 1 and 3 above.

Aglio was in general very precise in drawing his facsimile. According to his own notes on the drawings, he checked them against the original and in some cases he made small comments where necessary. In drawing 64 of codex Yoalli-Ehecatl, Aglio recognised his mistake and added the comment to place the Rabbit year glyph higher and put the numbers below (see figure 5.4A). In the published editions, this was not done, creating a slightly different composition than the original depiction (compare figures 5.4B and 5.4C). In the drawings of the Codex Dresden, Aglio was very thorough and he ends his work with:
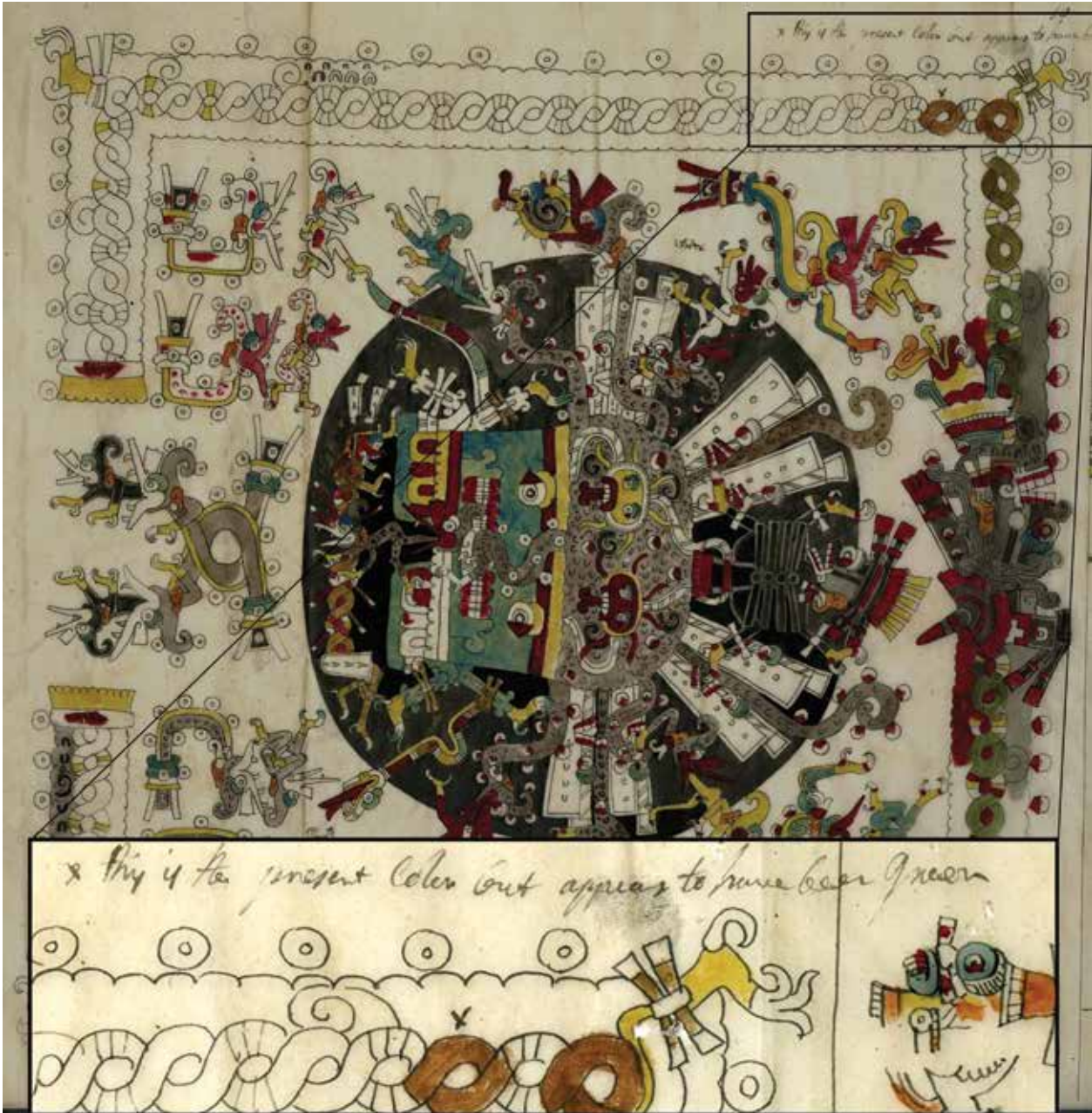
Figure 5.3: Aglio's drawing no 10 of the Codex Yoalli-Ehecatl, showing his system of partially colouring the images. The texts on the top continues on to the next page and reads "X this is the original color but appears to have been green", ©Trustees of the British Museum.
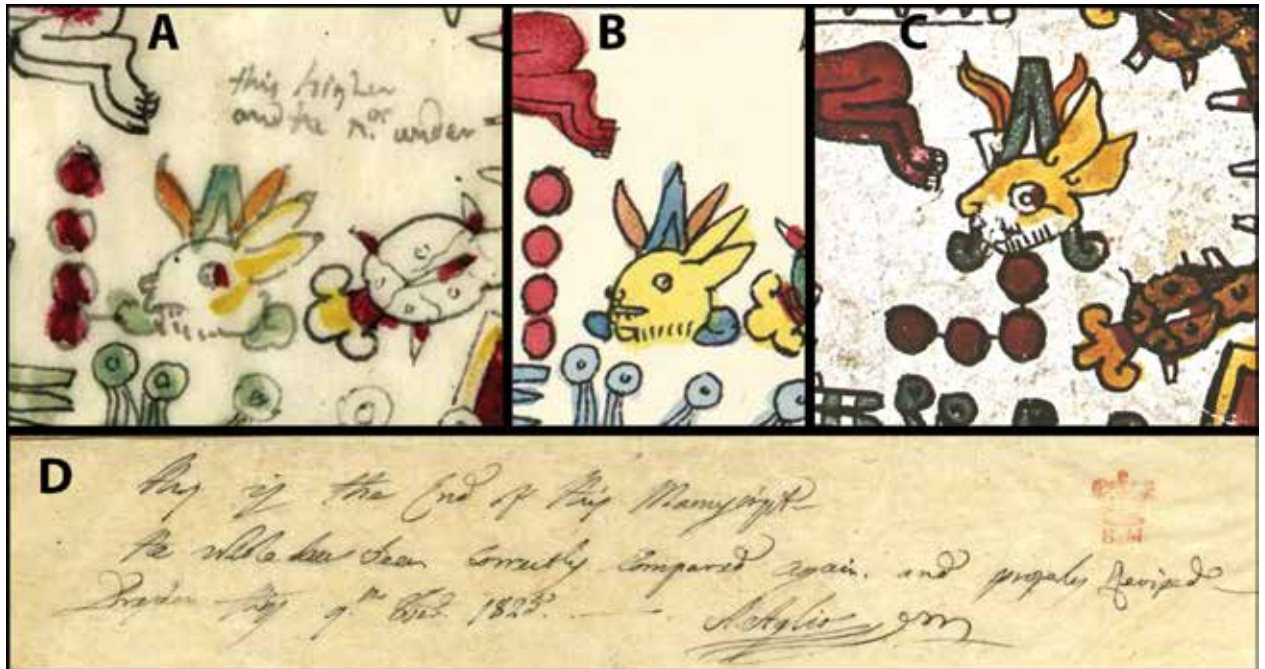
Figure 5.4A-C: Details of reproductions of page 50 in drawing by Aglio, Kingsborough et al. (1831) and Anders et al. (1993a); D: Comments of Aglio on his own work, showing his scrutiny of his own work, though not of the actual printed version (A and D ©Trustees of the British Museum).

"This is the end of this manuscript
The whole has been correctly compared a
gain and properly revised
Dresden this 9th dber 1825 – A Aglio"
(see figure 5.4D)

The exception to the rule of Aglio's precision is to be found in the calendar glyphs, which may help explain why the comment of Aglio shown in figure 5.4A was never copied into the facsimile. In the calendrical tables in the Codex Yoalli-Ehecatl and the Tonalpouhqui, Aglio used a system of numbers to designate the calendar signs. He numbered and drew the first row of signs, but only filled in the rest of the table with the corresponding numbers. As a result, the facsimile of the table looks very different, though it does contain the correct signs at the right locations in the table.

For the Codex Dresden, the drawings by Aglio are particularly helpfull because of the damage it suffered after the bombing of Dresden (see chapter 3).

Probably because of its complexity, Aglio made very precise copies, colouring each area when needed. Where in the other codices Aglio did not seem to care too much what the exact colour was in his drawings, the large palette used by Aglio for the copy of the Codex Dresden indicates his desire to get the colours absolutely right. In figure 5.5, it can also be seen that the palette used by Aglio in his own drawings better reflects the original than do the published images in Antiquities of Mexico. A detailed comparison of the original codex and the drawings of Aglio can further help to understand the extent of the damage done to the document.

Although this did not end up in the facsimile, Aglio did note the existence of three blank or heavily damaged pages of the Dresden Codex. He notes (see figure 5.6):

Figure 5.5 left: Codex Dresden page 60. Drawing by Aglio (©Trustees of the British Museum); middle: printed facsimile in the Antiquities of Mexico (1831); right: image of the original in its current condition (from www.slub-dresden.de accessed 06-01-2016.

"In this three pages the Original appears to have been entirely defaced by water, in the accident. The pages are all over of a dirty red wash. – but not the smallest indication appears of having had any cifers or figures on it.
Dresden dber 9th 1825   *A Aglio"*

The drawings made by Aglio formed the basis for the printed Antiquities of Mexico, which was made using a lithographic process. This printing technique – first invented in 1796 (Wijnekus & Wijnekus, 2013, p. XXIII) – relies on the principle that oil and water do not mix. On a flat stone, the drawing is drawn in wax or oil. The surrounding areas are then etched away using an acid. When the stone is then completely wetted, it will retain water in the etched areas. The areas of the original drawing can then be filled with an oil-based ink which, because of the repellent function of the water, stays in the right place. This ink can then be transferred onto paper.

Since a way of printing colour with this system was not yet invented, the prints of Aglio had to be colored-in after printing by hand. In this procedure, there are three stages in which errors are inevitably introduced. The first is the drawing by Aglio; the second is the copying of the drawing onto the lithographic stone; and the third is the colouring in of the lithographs. As a result of this way of working the facsimile in the Antiquities of Mexico are of
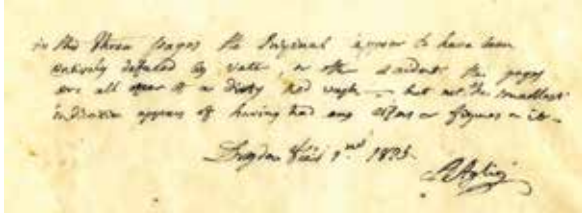
Figure 5.6: Aglio's comment on the defaced pages in het Dresden Codex (©Trustees of the British Museum).

varying quality. Nonetheless, for many of the codices they remained the only reproductions for almost a century. Furthermore, as the originals are not static, these facsimiles and especially the drawings of Aglio will remain important windows into an earlier state of the codices.

5.2 THE AGE OF PHOTOGRAPHY

The differences between the drawings and the printed versions of the codex show the fundamental problem of Lord Kingsborough's reproductions: their essential unreliability. Add to that the great expense of these versions and the outdated commentaries of Kingsborough himself, and it becomes understandable why half a century later new efforts were undertaken to create and publish another reproduction of these works (see Saville, 1901). The most important series representing this effort was sponsored by Joseph Florimont, the Duc of Loubat. Florimont had the codices of the so-called Borgia Group – including some post-colonial documents – reproduced using a technique called fotochromografia in the Italian commentary. It was thus a reproduction made using colour photography. This effectively removes one of the liabilities of the copying process: the recording of the original. Aglio's tracing papers were replaced with a photosensitive glass plate. Printing of colour photographs was, however, still somewhat difficult in this period, because the photo had to be transferred onto a printing plate before it could be printed on paper. This transfer, which in the time of Kingsborough still had to be done by hand, could be done directly using a principle called collotype printing since the late 1800's. In collotype printing, light is passed through the negative and shines onto a photosensitive, gelatine covered plate. The areas

Figure 5.7: Codex Borgia Loubat edition detail of page 56. Both the issue of shifting colours as well as the low contrast of the black lines due to the other colours printed over them can be seen.

exposed to light harden, while the areas that are kept in the dark remain gelatinous. The basic principle that underlies this technique is similar to that used in the lithographic technique. Ultimately, the hardened areas will retain ink, while the gelatinous areas will repel it (Wijnekus & Wijnekus, 2013, p. 137). With this technique only one colour of ink can be printed at a time, which is clear when the reproductions are studied in detail. Each page had to be photographed multiple times, each from exactly the same direction and each with a colour filter in front of the lens so that the colours could be registered individually. To make a coloured print, therefore, the three basic colours plus the black outlines needed to be registered separately. By using semi-transparent inks, other colours can be made by applying different layers of each individual colour.

A number of issues are clear with the reproductions undertaken by Loubat. The first is the issue of alignment. As each colour is printed separately, it is very important to align the paper correctly for each print run. In the versions of the Codex Yoalli Ehecatl (Borgia), Tezcatlipoca (Fejérvàry-Mayer), and Tonalpouhqui (Vaticanus B) held at the library of Leiden University, it is clear that sometimes the paper slightly shifted, resulting in one or more colours being printed in not quite in the right place (see figure 5.7). The second issue has to do with the printing of lighter and damaged areas. Since the prints are made by the mixing of colours, in order to make a lighter version of a colour – for example, making

Figure 5.8: Codex Yoalli Ehecatl (Borgia) Loubat edition details of pages 76 and 75 showing the extend of the fire damage before conservation treatment.

pink with the red ink – it has to be printed in such a way that the white background shines through. This means printing small dots instead of a solid colour. A third issue is that because the colours are only semi-transparent, the contrast of the images is not very good. The original codex creators had a similar problem, as seen in chapter 2. But in the case of the original Mesoamerican production of the texts, when a figure was coloured-in and some of the paint went over the black outline, these outlines were retouched to correct mistakes. With Loubat's prints, however, this did not happen, meaning that black outlines and small details are often not clearly distinguishable.

Still, it must be said that all of these issues are only minor problems for the study of these books and do not hinder the interpretation of these books. These reproductions were in fact the most faithful reproductions possible at the time, even reproducing for the first time the screenfold format. Moreover, because of the photographic method used, the Loubat reproductions also still valuable to researchers. When the printing issues are taken into account, they represent an earlier stage in the development of the codices that is invaluable to modern researchers. In particular, the Loubat editions of the more damaged books – such as the codex Yoalli Ehecatl (Borgia) – contain unique information that is today lost. For example, the Loubat edition shows the extent of the fire damage to the codex Yoalli Ehecatl (Borgia) before these areas were treated and reinforced (see figure 5.8). Besides these major advantages, the duc of Loubat also donated many of these copies to important libraries around the world, making his project a truly important one for the study of ancient

Mesoamerica in general and this corpus specifically. Between 1930 and 1940, the Librería Antiquaria Guillermo Echániz in Mexico City made a further series of facsimiles. An overview of the facsimiles produced by this editorial can be found in Glass (1975). Officially, only 25 seem to have been made of each codex replicated, as can be read on the frontispiece of the Codex Ñuu Tnoo-Ndisi Nuu (Bodley) version found online.[44] However, when Troike tried to find a copy of the Codex Tonindeye (Nuttall) in 1987 she only encountered a version from 1963 (Anders & Troike, 1987, p. 28). An example of this version is kept in the Dumbarton Oaks library and used in their online exhibit of rare books "standing on ceremony".

Comparing this edition with photographs of the original shows that the copies are of a relatively good quality, though damaged areas are completely restored and the colours, which are filled in by hand, are off. How exactly these outlines were copied and what the source of the copies was remains unclear and would require close examination. Comparison with the Dover editions (Nuttall, 2013), which is directly based on the drawings by Zelia Nuttall in 1902, and with the photographs of the original shows that the Echániz copies are closer to the 1902 reproductions than to the original. Comparison of pictures of three pages and the frontispiece of the 1947 edition of the Codex Ñuu Tnoo-Ndisi Nuu (Bodley) found on the website of a rare books seller48, with the at that time available facsimiles, shows that the Echániz edition was copied from the Antiquities of Mexico, not from the original. There are also errors in the Kingsborough edition that were copied in the Echániz version. In figure 5.9, a comparison of one line of page 16 illustrates these errors and divergences. In the original codex, the mouth of the mask on the back of Lady 7 Flower is red, while in the Kingsborough and the Echániz version it is blue. Furthermore, the eagle headdress of Lord 4 Water is coloured in blue in both later versions. There are also some new errors introduced by the creator of the Echániz version, making this a less reliable reproduction than the one drawn by Aglio.

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44. http://books.ioba.org/details.php?dcx=537219047&aid=vialibri#, accessed 30-10-2015.

Figure 5.9: Comparison of the central line of page 16 in the original Codex Ñuu Tnoo-Ndisi Nuu (Bodley), the Kingsborough edition and the Echániz edition. It is clear that the latter copied errors form the Kingsborough edition.

Although other copies would have to be investigated to affirm this claim, the series of Echániz seem to be copies made of copies, which were made and coloured-in manually. Combining this claim with the fact that only twenty-five of each were made, it becomes unlikely that the Echániz copies ever had, or ever will have, a great impact on the study of these books beyond being historical curiosities.

The first largescale project with the objective to reproduce all the codices in their original format was the Codices Selecti program undertaken at the Akademische Druck- und Verlagsanstalt in Graz. This series of prints was the first series of facsimiles of Mesoamerican codices to be made from single colour photographs. The codices are reproduced in true size and colour, and are folded in leporello format. Both the verso and the recto sides of the codices are printed when they contain something noteworthy. Commentaries on each codex were added as separate books or booklets. The contents of these commentaries – written by various authors – all excel in their physical descriptions of

the codices. The commentaries also illustrate an important difference in the Akademische Druck- und Verlagsanstalt approach to dealing with these books when compared with prior reproductive efforts. Where previously all reproductions (and studies) were performed within the conceptual framework of the astral interpretation (see Seler, 1902), Karl Anton Nowotny and Ferdinand Anders took a different approach. It was the express purpose of these authors to create a series of facsimiles with accurate, systematic physical descriptions, without going into the interpretation. The idea was that only after all these books were widely and freely available could comparison and interpretation begin.

Though the Akademische Druck- und Verlagsanstalt reproductions are the first ones to be made from single colour photographs, they are not perfect. Agfachrome 50s photographs form the basis for these prints, except for the earliest run of the Codex Yuta Tnoho (Vindobonensis Mexicanus I) (Adelhofer, 1963), which was made using old collotype plates used for a publication by Lehmann and Smital (1929). The

Figure 5.10: Three prints of the codex Mictlan (Laud) by ADEVA. Left: a red colour proof; centre: the final 1974 version and right: the 1994 version.

Codex Yuta Tnoho (Vindobonensis Mexicanus I) was later re-issued (Adelhofer, 1974) with the same commentary, but with a facsimile based on the new photographs.

Besides being made with new techniques of colour photography, these new facsimiles were made using a different printing technique as well. Instead of collotype printing they were made with offset halftone printing, which, according to the editors, was far superior as it required no manual correction (see Adelhofer, 1974). With this technique each colour in a photograph is first transformed into a series of dots of varying sizes. Most halftone prints are composed of yellow, magenta, cyan, and black dots. These dots are too small to see with the naked eye, but by varying the size of these dots the intensity of that colour is also varied (see Stulik & Kaplan, 2013).

This same technique and even the same photographs were used for the second run of ADEVA printed facsimiles; that is, those facsimiles that accompanied the series of new commentaries "Códices Mexicanos" printed by the Fondo de Cultura Económica between 1992 and 1996 (FCE, Mexico). These new commentaries, written by Maarten Jansen, are very different from earlier Graz editions, as these do focus on the interpretation of the codices. There in-depth discussion of the meaning of the texts and each commentary illustrates the parts of the Mesoamerican culture that these books would have been interrelated with. In an epistemological way, these commentaries

also go beyond their predecessors. For the FCE editions, it was decided to include the commentaries of a number of Mexican indigenous experts, including Luis Reyes Garcia (Nahua) and Gabina Aurora Pérez Jiménez (Ñuu Dzaui), for the creation of new interpretations. Without question, the cultural and linguistic background of these contributors greatly enriched the accompanying commentaries.

The multiple editions that rolled off the presses at Graz show that even the technique of photographic reproduction is not without its faults. Photosensitive glass plates had been replaced with plastic films, which contained photosensitive chemicals just like the glass plates used to. Every manufacturer of photographic films, however, used its own mixture of chemicals and its own procedure for developing the resultant negatives. The different chemicals in use resulted in photographs that differed in hue. When printing a photograph using the halftone process, the colour balance can be adjusted. In figure 5.10, three prints of the Graz facsimile can be seen. The left print was a trial run and it can be seen to be much too red. The trial run is an important part of the process of colour proofing, because it enables the identification of colours that need to be adjusted and to assess the accuracy of the resultant print overall. This can, however, be a very time-consuming process as each time the balance between the three colours of dots needs to be adjusted and a new print needs to be made. This new print then needs to be evaluated, preferably by comparison with the original. This process may have to be repeated many times over depending on the results of each trial run, and on

each occasion new printing plates would need to be made. The middle image of figure 5.10 shows the final result, which is relatively close to the original. On the right the same page can be seen but from the later FCE edition. Here the colour balance was adjusted more to the red, resulting in a more orange colour for areas that in the original are dark green; such as the feathers in the headdress or the fringe of the robe.

Next to these large scale projects reproducing multiple codices in the same format, numerous efforts have been made to reproduce individual books. There are too many of these smaller reproduction projects to introduce them all here. However, a few examples can be used to illustrate the formats in which the codices have become available today. The oldest of these, but still the most extensively sold ones, are the Dover publications of "The Codex Borgia" and "The Codex Nuttall" (Díaz & Rodgers, 1993; Nuttall, 2013). These paperback booklets incorporate drawings instead of photos, which are in turn copies of drawings made of the originals. For the codex Nuttall version, these were the drawings of Zelia Nuttall from 1902; while the Dover edition of The Codex Borgia is a photographic representation of the drawings made by Díaz and Rogers. In the latter the scenes that were damaged have been reconstructed. This makes the Dover edition hard to use for scientific research, since it is not indicated where the restoration took place. In the introduction to the Dover edition, it can be seen why and how these drawings were originally made. They were made in the context of a research on amate paper, and they were drawn on this material even though the original codex was made on skin. There is, therefore, a contradiction to this work. It is stated from the onset that the aim of drawing copies of the original codex was to reproduce the original splendour of the documents (Díaz & Rodgers, 1993, p. XI), yet the colours reproduced are the decayed colours visible during the late 20th century (Bruce E. Byland, 1993, p. XIII). Furthermore, the drawings are made based on photographs of the original, which, as seen above, may themselves exhibit differences in colour from the original. What's more, the commentaries in these editions are today relatively outdated as they are mostly based on work done in the late 1970's. And

they also do not represent the form of the original codex, as both are written in a continuous run of pages in European book format. Thus the two-sided leporello format is lost. Despite all these issues, the Dover edition of both "The codex Nuttall" and "The codex Borgia" are to this day the cheapest and therefore most accessible editions of these documents. They are the most commonly found reproductions of codices in museum gift-shops and they are probably, with the possible exception of the latest Codex Ñuu Tnoo-Ndisi Nuu (Bodley) edition (Jansen & Pérez Jiménez, 2005), the only full reproductions that have reached beyond the specialist audience.

The very opposite of this is found in the reproduction of the codex Yoalli Ehecatl (Borgia) by Batalla Rosado (2008). This edition is made for the eccentric bibliophile, as is stated in the introduction to the over five hundred page long commentary that comes with the facsimile (Batalla Rosado, 2008). It is published by Testimonio, an editorial house that specialises in making very high-grade facsimiles, usually of European or Arabian manuscripts, each of which cost thousands of Euros. The edition of the Codex Borgia is no exception. Having only access to the commentary, not the facsimile, it was not possible to assess the quality of the latter. From the price alone, as the author admits in the introduction, it can be predicted that the impact of this facsimile on scientific interpretation will be lamentably low.

As can be clearly seen by these two examples, there is a direct relation between the quality of a reproduction and its price, and it is ultimately the choice of the author or the editor which to favour. Obviously, this is all related to the intended audience and the goal of the publication. The Dover editions are aimed at the masses, while the Testimonio publications are exclusive collector's items. Two publications of codices by Jansen and Pérez Jiménez (2005, 2007b) are exemplary cases of finding a middle ground between these two extremes. Though they are not technically facsimiles as they do not give the images at their original size and the colours are off, these publications do present the codices in their entirety. The codex Añute is presented in its original screenfold format, though printed smaller than the original; while the Ñuu Tnoo-Ndisi Nuu

(Bodley) is printed as separate images per page in a European book. The advantage of the latter is that below the image of the codex, a thorough explanation of each scene can be given. In case of the Añute, line drawings are used in the commentary to guide the reader through a step-by-step reading of each scene. What characterizes these editions is the clear aim not only to present the codex itself, but also to give an understanding of the way in which these documents are to be read. As such, they become a way for the reader to familiarise him or herself with the Mixtec writing system in general. Both editions are made with a different audience in mind, which is reflected in the language used in the commentary and the titles of the books. In the commentary to the Añute codex there is much more emphasis on the Mixtec language. This would likely be lost on the British audience for which the Ñuu Tnoo-Ndisi Nuu (Bodley) edition is written, without a much more thorough introduction to, and familiarisation with, that language. The differences between the reproductions are great as well. First of all, the format of the Añute reproduction allows it to be used without the commentary. In the first edition, the reproduction was contained in a separate thin cardboard "sleeve". For the second edition, the long strip of cardboard on which the images were printed was glued between two covers. Since the reverse of neither edition was printed, this works out well, though this gives no indication of the palimpsest on the reverse (see chapter 6). In case of the codex Ñuu Tnoo-Ndisi Nuu edition, the leporello format is explained and the reading order is thoroughly discussed (Jansen & Pérez Jiménez, 2005, pp. 32-35).

All the physical reproductions available today suffer from two fundamental problems: the physical limitations of the reproduction techniques itself and the cost of those reproduction techniques. The first physical problem is caused by the fact that normal photography and printing techniques can only give a relatively accurate representation of colours on a two-dimensional surface, but will always miss the third dimension – and with that the texture – of the original document. Surface texture can have a large influence on colour. Although it will not matter much for the study of the interpretation of these books, the lack of surface texture makes for a very different

appreciation of the books. Physical reproductions lack the fragility of the original, and this in turn has an impact on the possible interpretations of how, where, and why these books could have originally been used (see chapter 3).

As has been shown, in order to make accurate photographic reproductions, the costs can skyrocket, making them less accessible. The better facsimiles become artefacts in their own right, only affordable to libraries, museum, or the rich. There is a direct inverse relationship, therefore, between the accuracy of the reproduction and its accessibility when it comes to physical reproductions. And even if the costs can be brought down, physical copies need to be transported to the user. The indigenous peoples in Mesoamerica are in general both economically and geographically marginalised.[45] This makes giving them access to their own heritage through these conventional physical means challenging.

5.3 DIGITAL REPRODUCTION

The digital age has greatly changed the image. Rather than being a physical reflection of a real world referent, the digital image exists as pure information. The information is encoded on a pixel level in the form of a code of ones and zeroes. The number of ones and zeroes is dependent on the number of colours that can be encoded per pixel. In a monochrome image – i.e. black and white – the number of bits per pixel is one. This means that the pixel is thus either white or black with nothing in between. In a two bit image, there are four possible outcomes: 0.0; 0.1; 1,0; and 1,1. This is translated into four colours per pixel. Currently most standard images encode in 8 bits, resulting in 256 possible colours per pixel. Since this colour information is encoded on a pixel base, determining the amount

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45. Some communities – such as the Mixtecs – have a long history of migration. Thus, while their home towns may be located in geographically marginal areas, they themselves move in and out of the centers. This may give new opportunities to connect with their cultural heritage. This was the main reason for allowing the Los Angeles County Museum of Art to borrow the Codex Añute for a unique exhibit Children of the Plumed Serpents, because Los Angeles has the largest migrant community of Mixtec origin in the world.

of pixels in an image is a case of the determining factors for the level of detail of that image.

Although like with a printed version the existence of images is predicated on a prior existing medium – i.e. a computer – as digital objects images themselves have no material presence. Because they are pure information, they can be infinitely copied and they can be infinitely transferred and transformed. With the internet, images can be downloaded from servers around the globe in mere seconds. All that is required is a computer with internet access. Both computers and internet connections are becoming more and more widespread even in indigenous communities around the world; although this is still an area where more work needs to be done. Once realised, the internet forms a way of providing access to indigenous heritage in a much more egalitarian way. It must be made clear, however, that the internet has thus far never been explicitly used for this in the case of the Mesoamerican codices. As with physical books, there are many websites in existence, which present parts of the codices, often only singular images, in order to make a point. There are relatively few websites that present the user with a representation of a full codex. Again, a few examples will be selected below to illustrate how the codices are made available to the public.

One of the oldest collections of images of the Mesoamerican codices on the web is found on the website of the foundation for the advancement of Mesoamerican research (famsi.org). Here pictures or scans are brought together from the first ADEVA edition and the Loubat edition, as well as many other resources for study, such as dictionaries, drawings of monuments, and research papers. This early attempt to make the codices accessible online must be given credit when considering the limitations of the technology when it was launched in September of 2004. The introduction of faster broadband internet connections was only just getting started. This combined with the fact that the images provided were copyrighted to the ADEVA publisher, must have prompted the decision to make the images available in small format only. The scanning of a printed photo also introduces problems of quality, such as the formation of artefacts in the image, shifts of colour, and, when the scanning is done improperly, the blurring of the image or uneven exposure. Most probably due to the inconvenient format of the facsimile for flatbed scanners, all of these problems occur in the Famsi images. As the Famsi site copied the images from the Graz edition, little was done to provide new information on the codices. Over time this website grew, acquiring more resources that allowed for the study of all Ancient Mesoamerican topics, though the overview of newest content shows a distinct Maya preference. As with all projects, it was – and is – dependent on continued financial support. Since 2012, no new content has been added and grant provision by Famsi to researchers has ceased since 2007.[46] Recently, management of the site was transferred to the Los Angeles County Museum of Art, which may allow the site to make a second start in the future.

In January 1999, a large scale project[47] started to digitise all Mexican documents held at the National Library of Paris. This National Library houses a large part of the Boturini Collection and is thus a major collection of especially colonial Mesoamerican documents. The objective of the project was to study a number of codices using the same methodology, deconstructing each to its smallest elements and thus create a dictionary-like database. The database was first planned to be distributed on compact discs in French, English, and Spanish. The website amoxcalli. org.mx presents digital photographs of the original investigated documents. Since many of these digital photographs were never published – at least not in such a detailed way – this website is an important source of new information. Each of these images is subdivided into sections or individual elements, which form entries into the database. It is clear that this project was originally designed to be presented in the form of CD's, with only one document per CD. Although the database itself is standardised and thus for each element has the same field that can be filled in (though in practice they are often not), there is no cross-referencing between the elements presented.

46. See http://research.famsi.org/grants/index.php, (accessed 20-10-2015).
47. A description of this project is found at http://www.ciesas. edu.mx/proyectos/Amoxcalli/Indice1.htm, (accessed 20-10-2015).

Thus, the database is strictly hierarchical. Because of this, the website is a great tool for those trying to understand a specific element in a specific known document, but it cannot, for example, help to locate the same glyph in other documents. As such, the website functions best as a repository for knowledge gained from a single previous investigation, rather than as a tool for new knowledge production. The images themselves are not of a great quality either. Although they are large, they are also generally made with a high ISO level, resulting in a high level of granularity. This means that fine details – such as small alphabetic comments on the document – become difficult to read due to the noise. The only precolonial document on this website – the Paris codex – remains important, however, as it is the only publically accessible version that is in colour.

Not all webpages on which the codices can be found are entirely made for researchers. A website devoted to teaching people about Nahua and Ñudzavui[48] (Mixtec) culture is Mesolore.[49] On this website, detailed readings can be found of three colonial Nahua documents (Matricula de Tributos; Lienzo de Tlaxcala; and The Molina Vocabulario), and three Mixtec documents (Codex Tonindeye (Nuttall); Codex Añute (Selden); and the Alvarado Vocabulario). Set up in 2008 by Liza Bakewell and Byron Hamann as a continuation of an earlier project which also started on CD-ROM, the current mesolore.org presents only the codex Añute (Selden) in full. This is also a scan of a facsimile – that by Caso (1964) – though in a high resolution. Next to this, the site presents a lot of background information, colonial documents, dictionaries, and vocabularies, as well as lectures and workshop tutorials and class materials. By linking to social media, the website also spreads news items, which are usually related to new archaeological discoveries. In essence, this website does not offer much unique new information. Still, the concise way in which the information is presented, accompanied by all the material to give a workshop or class, does make it a good resource for teachers.

The sites presenting entire documents are for a large part the product of researchers of those documents trying to present and disseminate their research. The exception to this is the dissemination of codices by the institutes that have them in their collections. With the advancement of the digital age, more and more institutes are starting to realise the potential of digitisation of their collections. Thus far, only the British Museum, the Sächsische Landesbibliothek, the Vatican Library, and the Museo Nacional de Anthropologia (Mexico) have made precolonial codices available, though the Vatican has only digitised one of the two in their collection (the Codex Yoalli-Ehecatl). The Vatican Library has also decided to add large watermarks to all its images, thus distorting the otherwise high quality result.

The fact that the other institutes have not digitized their precolonial codices should not be seen as a sign of unwillingness of the institutes themselves. At the Bodleian Library, for example, there is a strong desire to disseminate the codices. In fact, the Bodleian Library is the only library to have itself published a book on one of the precolonial Mesoamerican manuscripts in their collection (Jansen & Pérez Jiménez, 2005). As one of the legal deposits in the United Kingdom, the Bodleian Library now has over 11 million printed items.[50] The collection of manuscripts is equally impressive. As such, although they have the largest collection of precolonial Mesoamerican manuscripts in the world (three, if the Codex Añute is counted as precolonial), but within the total corpus of the Library they are not a priority. Until 2011 digitisation took place on a project base, resulting in clusters of images of different works being put on separate project sites. Since November 2011 the Bodleian Digital[51] has become a central hub into which all digital images are to be incorporated. The biggest issue for all these efforts is funding. Though most institutes holding codices are not aimed at making profit, they still need to pay for the maintenance of their facility as well as the collection itself. Whereas the publishing of a book can (at least in theory) pay for itself by

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48. Spelling as given on this website.
49. www.mesolore.org, accessed 21-10-2015.

50. http://www.bodleian.ox.ac.uk/about-us, accessed 21-10-2015.
51. http://digital.bodleian.ox.ac.uk/, accessed 21-10-2015.

the sale of the final product and even generate an income, digitisation does not result in any direct financial gain. There is even a fear that it may reduce the number of people coming to the library and thus spending money locally, even if such expenditure is just for an annual reader's card.

If digitisation is done correctly, however, it can be of a major benefit to the items themselves, as for many aspects of research they would no longer need to be physically handled. This, in turn, can help reduce the costs of conservation and restoration. Besides these considerations, there is a moral aspect that these institutes in general understand well. As the last remnants of a literate tradition, the value of access to these documents for the indigenous people is understood. As these documents in general do not travel and as the trip to Europe is for most indigenous people in present day Mesoamerica not an option, digitisation can help to bridge the gap between contemporary Mesoamericans and the objects of their own heritage. With this moral dimension in mind, major downsides in the way that the documents have been made available by the institutes up to this point can be identified. First of all, there is no explanation of the documents given in the catalogue of these institutes, besides a very basic form or type description. This is understandable as the focus of these institutes is to provide access to the material, not to interpret them, but it does mean that a user must be familiar with the subject to find interpretations elsewhere. The exception is the Codex Dresden at the Sächsische Landesbibliothek. This website has a lot of information on this codex, however thus far this seems to be available only in German. For English or Spanish users, a small leaflet can be downloaded which contains basic information in a manner similar to the other digitally available codices. The British Museum website does not provide a lot of interpretative information, but does give a small bibliography where this can be found. Being a museum rather than a library, it also links the entry of this codex to other types of objects from the Mixteca. The second issue related to the moral dimension mentioned above is that these digital reproductions are often buried deep in digital catalogues, making them impossible to find unless one knows exactly where to look. Thus, someone

who does not know that the so-called codex Borgia is held at the Vatican Library will likely never find the images. This is made even more difficult by the names used for many of these codices compared to the names used in the catalogues. Codex Yoalli Ehecatl (Borgia) is recorded under its Latinised name Codex Borgianus or the call number Borg.Mess.1. A problem first signalled by Jansen and Pérez Jiménez (2004) is that their names make them even harder to find for non-specialists and especially for indigenous peoples, because names like Codex Selden or Codex Bodley do not reflect the Mesoamerican origin. Digital catalogues have the advantage that it is very easy to search on keywords and to link one entry to another, thus an easy way to start renaming the codices is already to be found in these kinds of databases.

5.4 RE-PRODUCING CODICES

Next to the production of facsimiles of known codices some people have busied themselves with the production of new originals. This can be seen as the direct, though unintended, result of the dissemination of the codex images to the general public. Rather than printing codices on paper, these people have tried to reproduce codex images – or codex-inspired images – by hand. In some cases, these efforts were presented as new works; i.e. artistic or commercial works inspired by the pre-colonial and colonial originals. This is, in essence, not problematic and the interaction with indigenous heritage to form new artistic expressions may be very valuable, if done in a respectful way. Some of these copies or new works, however, are presented disingenuously by their producers or by later owners as ancient originals. Often these producers use materials that they consider to be authentic to provide support for their claims. In general, there is not much difficulty in proving that such a fake is in fact new. However, since the corpus of these documents is so small, even the addition of a few pages can potentially alter the interpretation of the whole corpus and of ancient Mesoamerican history in general. A case in point is the Grolier Codex. A lot of discussion surrounds this document which has still not been conclusively proven to be a real

Figure 5.11: The document brought in by local Leiden arts dealer (photo by the author).

precolonial document or a recent fake. The problem is that if it is real, it would be so old that there are no comparable documents to determine its authenticity content-wise. Materially, it does not contain anything to indicate that it is a fake (Ruvalcaba et al., 2007), but this in itself is not however an argument for its authenticity. Even radiocarbon dating cannot be used to determine the true origins of the Grolier Codex, as it is not impossible to find ancient paper in caves or other dry contexts. One thing that throws doubt on the authenticity of this document is the pattern of wear. Some areas seem deliberately cut, while at other areas the inks overlap with areas of gesso degradation (Ruvalcaba et al., 2007, pp. 7-8). Moreover, the stains at the edges have the appearance

of being applied intentionally, though these need to be further analysed to be better understood (Ruvalcaba et al., 2007, pp. 6, 8). However, since there is no recorded provenance of this document and it is thus unclear what the conditions were in which this document would have been kept over the last hundreds of years, the presence of intentional staining would not in itself be conclusive evidence to declare the Grolier Codex a fake. But whether or not the Grolier codex is real, there are certainly many fake codices around (see Glass, 1975). During this research project alone, two new fakes came to the attention of the researchers. A discussion of these two is here included to show two ways in which codices are reproduced and to explain the rationale of the
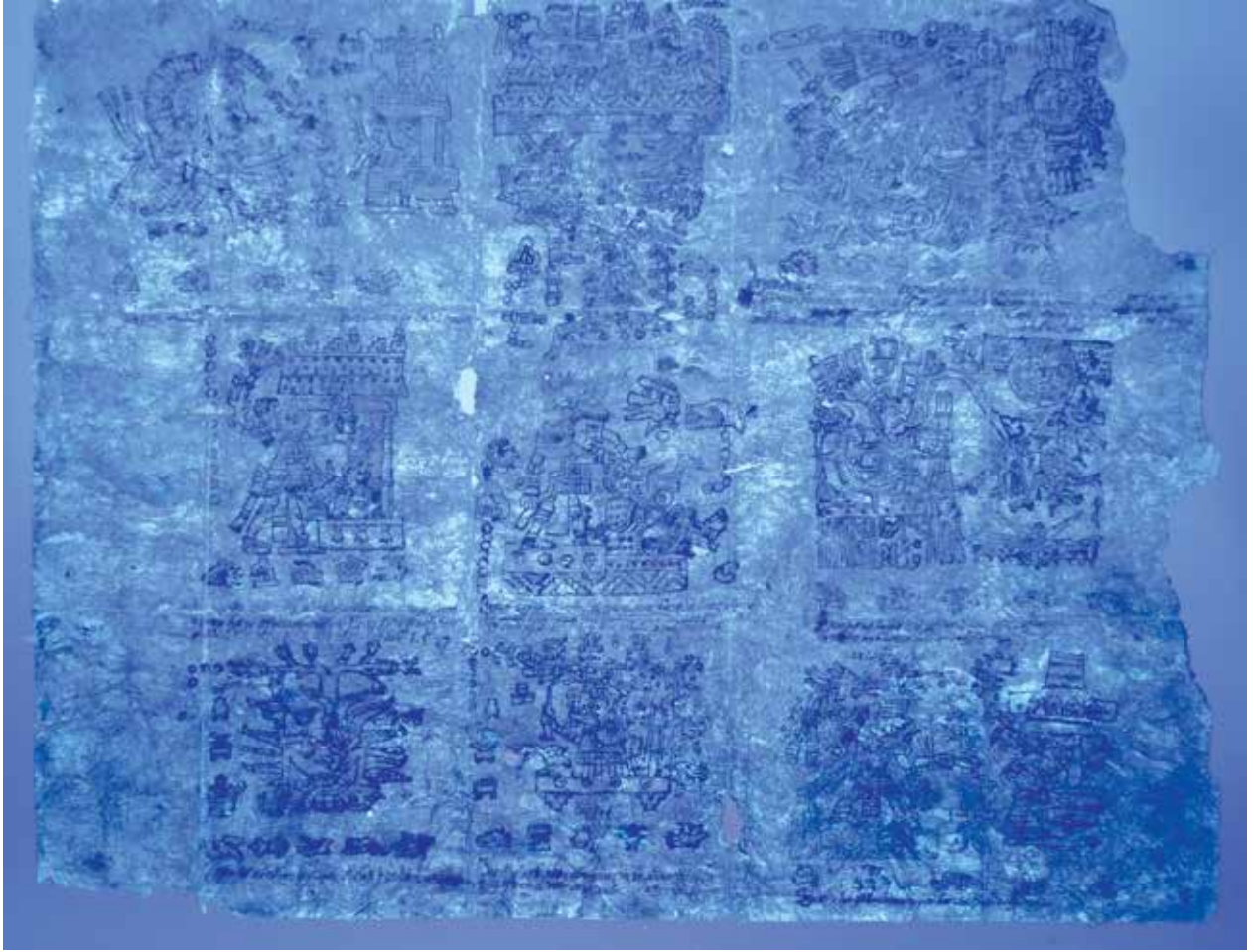
Figure 5.12: The Leiden copy under UV light showing the texts written between the figures (photo by the author).

producers of these fakes. Interestingly, at the surface at least, two very different rationales lay behind the two fakes that the researchers came across during the period of research.

The first re-production came to the attention of the Leiden research group when it was brought in for examination by a local arts-dealer. He claimed to have bought this document on an auction, though was reluctant to say where and when. The document (see figure 5.11) consisted of a single sheet of amate paper of approximately 35 x 45 cm, on which nine pictorial scenes could be seen.

What is immediately clear to anyone familiar with the precolonial codices is that these nine scenes are directly copied from a number of different codices. From top to bottom and left to right these are: Codex Tlamanalli (Cospi) page 12; Codex Yuta Tnoho (Vindobonensis Mexicanus I) page 48 (part); codex Yoalli Ehecatl (Borgia) 17; Codex Tezcatlipoca (Fejérvàry-Mayer) page 34; Codex Tonindeye (Nuttall) page 52; Codex Yoalli-Ehecatl page 71; Codex Mictlan (Laud) page 16; Codex Mictlan page 13; and Codex Tlamanalli, also page 12. Besides these figurative scenes all but the middle and top-middle scene have a series of calendar signs below them, even though not all of the original figures have these calendar signs themselves. In the top

Figure 5.13: Page 1 of the Tzolk'in of Wenk'al, The snake or dragon that dominates this page is clearly not Maya in style.

Figure 5.14: Page 7 verso of Tzolk'in of Wenk'al, demonstrating the pseudo-glyphs that cover this side.

left sequence of calendar signs, the sign for House appears twice, though in different styles. This shows that the author of this document was not completely familiar with what he was copying. As there are scenes copied from both historical and religious documents, it is clear that there is no internal logical consistency between the scenes. What makes this document more complex is the alphabetic texts added between the figures (see also Appendix B). These texts were made using an ink that faded and are now only visible using a UV light (see figure 5.12).

These texts show a conscious attempt to trick the observer into thinking this document is more than it is. The creator of this document added partially legible Spanish comments and Nahuatl-like words to make the document appear like a precolonial document with notes in the style of the early colonial friars. For example, multiple texts start with the

phrase "dizen que fue, " – i.e. "they say that there were" – recalling the way that early colonial friars related what their informants told them. There also appears a date "año 1527" below the central figure. All the texts are only partially legible and thus suggest an old age for the document, without saying so much that the creator would be forced to betray the fact that he was not completely – or not at all – knowledgeable about the subject. There is one point where this goes completely wrong. Above the central figure is written "8 Venado". This particular way of writing the calendar names of the Mixtec Lords and Ladies with a European numeral was first introduced by Alfonso Caso, best expressed in his dictionary of Mixtec Kings and Queens (Caso, 1979). This shows that this document cannot have been made before the writings of Caso. Purely by coincidence, a very likely source-text for this copy was encountered. In 1953, a small book was published called "Magic Books

from Mexico" (Burland, 1953). This book contains 16 colour plates, which include all nine of the plates copied on this sheet of amate. A further indication that this book was copied comes from the text above the top left figure, which reads ixcaliuhqui. The figure on the top left and that in the bottom right in this copy are printed above each other in the 1953 book. This could explain why the name of the deity depicted in the bottom right – given as itzcoliuhqui by Burland (1953) – appears above the top left figure. If indeed "Magic Books from Mexico" is the source text for this copy it is clear that the document is in a very rough shape for its age and it must be considered that indeed this is a fake, rather than a simple copy. It is, then, consciously made to look older than it is. The inks used would have to be a very inferior quality or specially treated to have faded that much, and the paper itself should not be in such a poor condition. All of this shows that the creator of this document had a specific idea of what a potential buyer would think an ancient document would have to look like. The choice of substrate, the worn look, and the faded colours were all specifically chosen to trick the buyer into thinking he had something more special than it in fact was.

A second document – called the Tzolk'in of Wenk'al – came to the attention of the author in the summer of 2015. It is a supposed Maya codex of which coloured photocopies were offered by a self-proclaimed Maya Elder called "Hunbatz Men" to the Wereldmuseum in Rotterdam (The Netherlands).[52] This codex-style document contains thirteen pages, each of which is painted on both sides. They were supposedly connected in an accordion format, though the copies show each as a separate sheet. The damage along the edges shows the paper has a very coarse fibre. Comparing the edge damage as well as the surface scratches near the edges casts doubt on whether these pages were ever part of one whole, as the scratches do not align. The pages are extraordinarily large in comparison to the known Maya codices, each measuring 20 by 26 cm according to the text

written by Hunbatz Men[53] and included in the folder of images. Besides the fact that the style of the iconography is clearly not ancient Maya (see figure 5.13), the glyphs are also either completely made up or at least nonsensical within the context that they appear.

On one side of the document, glyphs are used that seem to be inspired by the known codices, specifically the Dresden Codex. On the reverse side, the pseudo-glyphs seem to be inspired by real glyphs found on Classic Stelae, though they are completely nonsensical and have an almost comical appearance (see figure 5.14).

The explanation of this document as it is given by Hunbatz Men, shows how this "codex" would have been used and why it was made. First, the document is compared and equated with the three known Maya codices held in Madrid, Dresden, and Paris. No mention is made of the Grolier codex or any other documents of which the authenticity is under discussion. It is then claimed to be a precolonial original document. The Tzolk'in of Wenk'al is interpreted in a numerological way, where the number of glyphs is important, rather than the actual meaning of the glyphs, which is never given. The dot and bar numerals that abound throughout the codex on the other hand are completely ignored. Even the size of the codex is clearly not accidental, with thirteen pages each measuring 20 cm making a total length of 260 cm, the number of days in the calendar. This of course skips over the fact that the ancient Maya did not measure in centimetres. The images that fill more than half of every page are interpreted in a very superficial manner. For example, about page 2a (see figure 5.15) the reader is only informed that:

"the central figure is the head of a fox, an animal that represents trickery, observation, patience and other qualities."

Besides the fact that this interpretation is very shallow going into only one element of this rather complex design, these attributes given to the fox are not Maya

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52. These copies as well as the "interpretation" of Hunbatz Men are now held at the Library of the Museum Volkenkunde in Leiden.

53. No scale is included in the image so it is difficult to be sure about this.

Figure 5.15: Detail of page 2 of the Tzolk'in of Wenk'al showing the "Fox head"

at all but European. This document is thus interpreted by and for people that have very little knowledge of ancient Maya culture or writing. What Hunbatz Men is trying to convey to the reader, therefore, is how this document can be used as proof for his own ideas about Maya spirituality and the secret Maya wisdom that they encode for predicting the future.

This is symptomatic for the way in which New Age religions (there are many forms) deal with both ancient and contemporary cultural expressions. The movement is firmly rooted – and even a result of – Western capitalism (Aldred, 2000, p. 329; York, 2001, p. 367). As was shown in chapter 3, religion creates community through communal ritual. Religion in the Western capitalist society is an increasingly a private affair that one can choose to belong to or not. Secularisation combined with globalisation has turned religion into something chosen from a competitive marketplace, rather than a state-sponsored and predetermined certainty (York, 2001, pp. 362-363). This has led to a lot of uncertainty, as the foundation of any religion is an unquestionable Truth (see Rappaport, 1999). But all of the New Age religions try to combine different elements of religious practices from around the world into something new. In this sense, New Age religion plays right into the uncertainty that the religious marketplace has created. Often some ancient, secret, exotic, or extra-terrestrial element is included. This provides a source of sacred knowledge that is beyond the understanding of regular persons. And, in turn, this becomes a new unquestionable Truth which can only be interpreted by the initiated few.

Because it comes from the principles of the free market economy, there is no inherent contradiction in asking money for the spiritual service within the New Age movement. As consumers, the believers are generally happy to pay for these services and for the products that are being sold both in stores and online. Thus multiple websites[54] hail Hunbatz Men as an almost heroic figure of great knowledge and yet simultaneously charge large amounts of money for his books, videos, and for so-called healing sessions with him personally.

Both fake documents discussed here are thus part of a continuing process of commercialisation of an appropriated culture. It is unclear who made the central Mexican fake, yet it ended up in a Western-style arts auction. Although Hunbatz Men claims to be Itza Maya (his true identity is somewhat unclear), many non-indigenous, mostly North American, New Age specialists profit from the sale of indigenous spirituality. As can be seen with the faked Maya codex, in the process these belief systems are often dumbed down and re-cast into Western – and market capitalist – terms.

The use of indigenous spirituality has provoked much anger in North America (Aldred, 2000, p. 335). But in Mexico and Guatemala the use of Indigenous culture has in general received a more mixed reaction. This is mostly due to the fact that centuries of colonialism by the European powers and by later policies of the national regimes have been internalised and left many indigenous peoples with the idea that their culture and language is not worthy of attention. As such, some Indigenous peoples see the interest in their cultural expressions – even though they are completely misinterpreted – as a form of valorisation of their cultural roots. Another large factor is the financial gain of having groups of New Age believers coming to indigenous communities to visit sacred places and talk to "real shamans". While some may grudgingly welcome the New Agers, others see all precolonial spirituality as

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54. These sites include http://www.cosmicmysteries.com/; http://www.council-of-world-elders.de/; and http://www.prophecykeepers.com/hunbatz-men.html. A very different view of Hunbatz Men is found on http://www.newagefraud.org/smf/index.php?topic=1035.0 (all accessed 19-10-2015).

something that needs to be wiped-out, mostly under the influence of new protestant missionaries. Thus, the link between precolonial roots and contemporary indigenous society is under pressure from all sides.

DISCUSSION AND CONCLUSIONS

A general trend can be seen in the reproduction efforts discussed in this chapter: a definite and systematic increase in the accuracy of the capturing of the images that compose the codices. The tracing paper of Aglio was replaced by photosensitive chemicals on glass plates and later on plastic films. At first, these plastic films were only able to register one colour at a time, but later inventions made it possible to record the image as a whole. Digital photography then removed the dependence on chemical substances altogether, replacing it with photosensitive sensors. With this increase in accuracy, the faith put in photographic reproductions also increased. However, as shown in this chapter, the reproduction of the codices did not only depend on the techniques used to record the image, but also on the printing of that image. In order to get a truly accurate depiction, multiple proofing prints needed to be obtained at great expense. Thus, the most accurate reproductions were – and are – very expensive. These reproductions have become a type of artefact in their own right or at least a stand-in for the inaccessible originals. This has led to a number of issues, as for some of these reproductions the colours may be off, they may appear to be less fragile than the originals, and they are completely two-dimensional.

The digital age has provided some solutions to these issues. First of all, digital photography and image processing has allowed for a much easier calibration or correction of the colours. Here there are again some issues, however, with the presentation of the gathered data, as, for example, computer screens may not be correctly calibrated. Still, these are all issues that can be checked and corrected, so long as photographs are taken with a reference standard. Digital photos do, however, remain two-dimensional. A number of techniques exist for making a 3D recording of a surface, though these methods are still very much in development. The difficulty in this case is that, rather than with many other (archaeological) artefacts for

which such methods are already used, the variation in one of the three directions (the Z axis) is much lower than in the other directions (X and Y axes). Thus, the techniques need to be very precise as errors during recording have a much greater impact on these small variations. Such precise techniques are generally developed for other types of cultural heritage and so it is likely to take time to adapt these techniques to the reproduction of codices. Lessons can be learnt from the present application of these techniques, however. For instance, one application where similar problems have been encountered is with the recording of the three-dimensional structures of oil paintings. A recently developed portable and non-invasive technique – called fringe encoded stereo vision – is now able to record both the local colour and the variations in height in high detail (Zaman, Jonker, Lenseigne, & Dik, 2014). This technique, then, allows for the creation of a digital height map of the surface in colour, which could be applicable in the case of codices. A second, potentially useful technique that can mimic the three-dimensional effect of the surface is RTI imaging (see Malzbender, Gelb, & Wolters, 2001). This technique uses a series of digital photographs taken from a fixed point, while varying the direction of illumination. Differences in recorded colour occur because of variation in surface topography. Thus, from these photographs a single image can be created in which the user can place the light source in any desired position. In order to increase precision, the number of photographs can be increased, but this only works if there is no variation between the position of the camera and the position of the recorded object in each photograph. The location of the light source must also be known as exactly as possible for each photograph. This second technique has already been applied to the codex Añute for the recording of surface information and is discussed further in chapter 6.

The generation of 3D data is picking up speed in many different areas of research, but also in commercial application in, for example, the field of 3D printing. Now, in fact, even the printing of the 3D scans of oil paintings belongs to the realm of possibilities (see Zaman et al., 2014). But there is a general challenge with this type of data, because as the accuracy increases, so does the file size. And many

high-resolution files are too large to be accessible to non-professional users. It may be that technological advances will remove these problems in the future, but at this time 3D technology is not yet at a stage where it can be effectively used to disseminate these relatively large objects of cultural heritage in detail.

In this chapter, it was also seen that the dissemination of the codices to the general public has had some unintended consequences. With increasing accessibility of these codices both as physical reproduction and on the internet, re-appropriation, commercialisation, and general misuse only becomes easier. Although the making of fake codices may appear at first relatively harmless, there is an entire industry behind some of these objects that is intent on making money through the exploitation of the Mesoamerican indigenous heritage. In this way, this heritage is being misrepresented and misinterpreted, which ultimately devalues it. It is, therefore, important to consider how data is presented either online or in print, and to critically evaluate what information is provided with that data. In the general conclusion of this work, a possible framework for doing just this will be discussed.