



A Caribbean Directory-based Encryption during the American War of Independence

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A Caribbean Directory-based Encryption during the American War of Independence Bellecombe, governor of Saint-Domingue, 1782

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Abstract

The corpus of letters we are studying is located at the *Archives Nationales d'Outre-Mer* in Aix-en-Provence, France. These late 18th-century letters come from Saint Domingue (now Haiti), a French colony in the Caribbean Sea of which Bellecombe, the author, was governor. They were written in the context of the American War of Independence, in which France took part on the side of the Americans. We have reconstructed Bellecombe's correspondence with the Secretary of State for the Navy, in Versailles: the archives contain hundreds of letters in clear and three encrypted letters, including some clear/cipher pages that were our lever for reconstructing part of the key, and 96% of the encrypted letter that was opaque at first. From a cryptanalytical point of view, Bellecombe used a directory-based encryption. The common use of this type of cipher in the 17th and 18th-century European countries raises the question of the method to be used (then as now!) to decode such messages.

1 Introduction

Occasionally, in a box of archives, the historian suddenly comes across an encrypted document that remains just as it was sent. It is not surprising to find this type of missive: precautions were taken to ensure that a confidential document could not be read if it fell into enemy hands. What could surprise the historian is that the official addressee

either did not decrypt it, or did not keep and enclose it. As it is rare for the cipher key to be included in archives, some documents remain unexploited because they are incomprehensible.

While studying the American War of Independence, particularly in the West Indies, one of us came across a number of encrypted letters, the contents of which have remained inaccessible to historians. These documents are kept at the *Archives Nationales d'Outre-mer* "French National Oversea Archives", in Aix-en-Provence, which holds all the archives relating to French colonization, from the 17th to the 20th century. The discovery was made while exploring correspondence from the governor of Saint-Domingue, now the Republic of Haiti, at the time the largest of the French sugar islands, and therefore a major economic stake. The historian, powerless in the face of such a succession of numbers, turned to the code breakers.

At first glance, the cipher is already visually very typical: the presence of pages of numbers between 1 and 999 (see Figure 1) suggests that this is a *directory-based encryption*. We do not know if there is already an English word for this type of cipher. If not, we would like to suggest this name for ciphers halfway between homophonic ciphers (with a small nomenclature of around 20/30 words) and code-book ciphers that use entire dictionaries. The name is based on the French term *chiffrement à répertoire*. Whereas the cryptanalysis of ciphers from the 16th century, such as homophonic ciphers, starts to be well understood (Pierrot et al., 2023; Lasry et al., 2023) this type of system used in the 17th and 18th-centuries in Europe

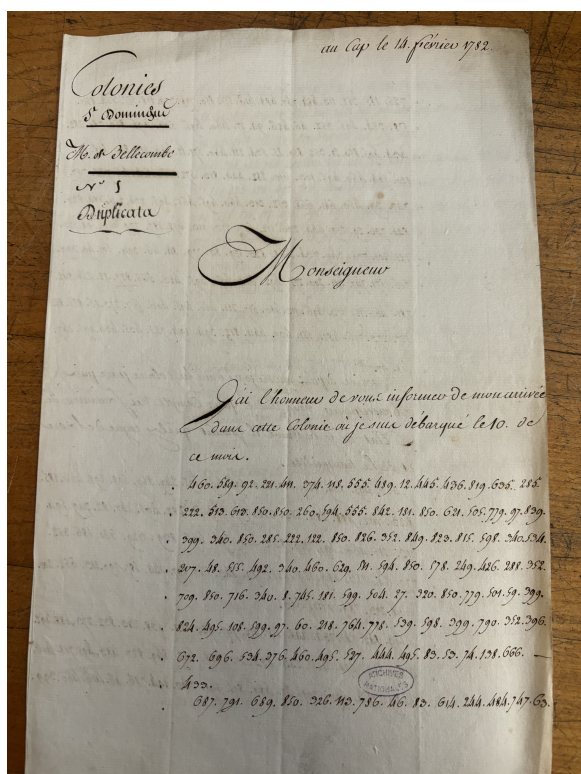


Figure 1: First page of the encrypted letter 1

deserves a closer look.

2 Historical Context

The American Revolutionary War, which pitted the Thirteen Colonies, a group of frontier colonies in North America, against the Kingdom of Great Britain from 1775 to 1783, was one of the processes of the American Revolution that saw the United States emancipate itself from the British Empire and gain independence. In 1777, following the Battle of Saratoga, other European powers joined the American people, notably France which provided soldiers, equipment, donations, and loans to the insurgents. France officially committed itself in 1778. French naval and land aid, and the support of its allies, contributed to the American victory, notably at the Battle of Yorktown, which led the British to surrender their arms and accept the independence of the United States with the Treaty of Paris of 1783. Contrary to its name, most of the fighting in the American War of Independence took place in the Caribbean, where the involved countries all had colonies. The main islands were: Cuba and Santo Domingo (the eastern part of the island of Hispaniola) for the Spanish; Jamaica and the Bahamas for the English; Saint-Domingue (the western part of the island of

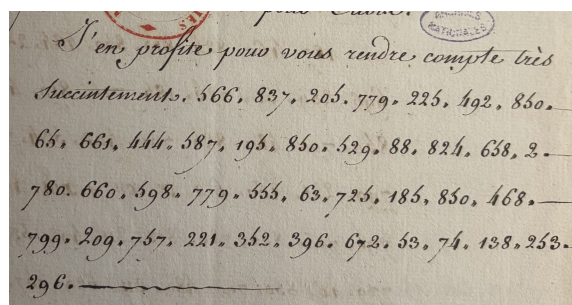


Figure 2: Beginning of the ciphertext in letter 57

Hispaniola) for the French.

Several governors took over the French colony of Saint Domingue during this war: D'Argoût until 1780, Lilancour on an interim basis, Villeverd from 1780 to 1781, Lilancour again, then Bellecombe in 1782. More precisely, Guillaume de Bellecombe, who is the author of all the encrypted letters this article deals with, remained in post from February 14, 1782 until July 3, 1785, i.e. after the end of the war.

3 Bellecombe's letters

All Bellecombe's ciphertexts found are in the COL C9 B 32 collection at the French National Oversea Archives¹. This collection corresponds to all documents sent from Saint Domingue to the Secretary of State for the Navy during the year 1782. A large number of clear letters have been preserved in COL C9 A 153 and COL C9 A 154 (year 1783) and then in COL C9 A 155 and COL C9 B 34 (year 1784), but none of them are encrypted. The number of pages from Bellecombe can be quite large: for instance, there are 360 clear pages in Bellecombe's hand in the COL C9 A 155 collection.

In all, there are several hundred pages of Bellecombe's clear letters, and 11 encrypted pages spread over 3 different letters numbered 1, 57 and 87, all dated 1782. Every single letter Bellecombe sent has a number and a date, so organization is easy. In COL C9 B 32 we found many non-encrypted letters, that are the following: 2, 5, 6, 7, 8, 9, 10, 11, 14, 26, 30, 31, 32, 38, 47, 48, 49, 50, 57, 58, 59, 61, 62, 76, 77, 71, 80, 83, 87, 131, 132, 163, 168, 186, 216, 248, 272, 276, 277, 287, 288, 291, 317, 321, 361. Table 1 highlights the existence of two pairs of clear/cipher letters with the same number. It was a prolific correspondence,

¹ Archives Nationales d'Outre Mer, 29, ch. du moulin de Testas, 13182 AIX-EN-PROVENCE, France. <http://www.archivesnationales.culture.gouv.fr/anom/fr/>

with almost a letter sent every day, of which only one eighth has survived to this day.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	X	Y	Z	&
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

NOMS DE LIEUX

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	X	Y	Z	&
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Figure 3: The gigantic cipher table of D'Argoût, governor of Saint Domingue, 1778.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
...	...	...	...	...	...	...	...	...	...

Figure 4: The corresponding table to decipher D'Argoût's cipher, 1778.

Letter number	Date	Length in pages
Clartexts		
57 (primata)	4 July 1782	2
87 (copie)	17 September 1782	3
Ciphertexts		
1 (duplicata)	14 February 1782	4
57 (triplicata)	4 July 1782	4
87 (duplicata)	17 September 1782	3

Table 1: Bellecombe’s ciphertexts together with their clartexts, when they exist, in COL C9 B 32.

4 Decryption methods

4.1 Cryptographic method of the time

All the ciphertexts we have consist of long sequences of numbers between 1 and 999, which is common in the 17th and 18th centuries. See Figure 2 for instance.

Given this visual aspect, the century, and the fact that this is military correspondence during a war period, everything suggests that we are dealing with a directory-based encryption: in this type of cryptosystem, each symbol (or number) always carries the same value throughout the message. The difficulty of cryptanalysis lies in the very large number of these symbols. Some have the value of a letter or syllable, others are nulls (around ten or twenty) or proper nouns, but the vast majority are ciphers of complete and common words (e.g. in French *contre* “against”, *pour* “for”, *aucun* “none”), prepositions and endings (e.g. *ment*, *ance*), or verb radicals (e.g. *donne* “give”, *diminu* “decreas”). We found in COL C9 B 28 collection a valuable cipher table established in the same context: that of Governor Robert, comte d’Argoût, represented in Figures 3 and 4. D’Argoût was governor of the same colony from 22 May 1777 to 7 Mars 1780. His cipher table from 1778 predates the beginning of the war and is accompanied by a decryption table that is easier for the recipient to read and use. Figure 3 is not Bellecombe’s key – it is likely that the keys changed with each governor – but it does indicate the maritime (e.g. *navire* “ship”, *voile* “sail”, *chaloupe* “rowboat”) and military (e.g. *paix* “peace”, *munition* “ammunition”) vocabulary we can imagine finding there too. Even better! A careful eye will notice that the vocabulary of the table is printed, only the place names are left to the secretary’s choice. This sug-

gests that Bellecombe uses the same basic words in his nomenclature.

While the process of encoding and decoding using a directory-based encryption table is well understood, we are not aware of any document detailing the cryptanalysis methods employed at the time.

4.2 Transcription

We give in the Appendix the transcriptions of the cipher parts of letters 1, 57, and 87. It was not always easy due to ink deterioration and the difficulty of recognizing certain numbers caused by the writing style. A common technique in the field of historical cryptanalysis is to use machine learning tools to automate transcriptions. Yet, the transcript of Bellecombe’s letters with online tools such as (Escriptorium, 2019) or (Transkribus, 2013) was not sufficiently good to rely on it. The consequences of a bad transcription can be important as it will influence our analysis a lot. For this reason, we manually transcribed a total of almost 1500 symbols and double-checked everything.

4.3 Reconstructing part of the key

A quick statistical analysis – see Figure 5 – gave us the meaning of the number 850, which is the word *de* “of”. We tried to decrypt in priority the most common numbers to clear as much of the letter as possible. In fact, this is not an easy task. Because the slicing of a plaintext word follows no apparent rule, it is very difficult to guess from nothing what the first numbers of a sentence could be. The fact that letter 57 had multiple clartext zones in the cipher was a huge help, so we focused on this letter first. Those clartext zones, as well as the initial observation that $850 = de$ gave us a clue to match the numbers and corresponding plaintext parts.

Other obstacles emerged. For example, we stumbled across a letter which the clartext did not perfectly match our decryption. In the cipher letter 57 we deciphered the sentence 657 389 114 399 756 113 736 580 185 273 254 572 614 344 194 850 716 610 530 233 92 495 408 779 664 571 185 759 489 12 745 672 850 285 181 493 623 495 505 779 97 839 399 340 as *je me borne a vous annoncer quil partira de ce port quelque jours après lequinox un convoy de quante voiles sous lescorte...*². However, in the clear letter 57

²I can only announce that a convoy of “fty” sails will leave

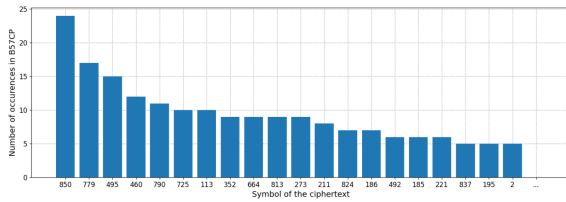


Figure 5: Most common numbers in letter 57 and their respective frequencies.

we read *Je me borne à vous annoncer qu’il partira de ce port, quelques jours après l’équinoxe, un convoi de quarante-cinq à cinquantes voiles sous l’escorte*³. As we can see, a crucial information here is the number of sails, and it does not appear clearly in the ciphertext.

A step-by-step comparison of the plaintext and ciphertext in letters 57 and 87 enabled us to establish an initial correspondence of values. With this partial table, 73% of the total different numbers we see in letters 1, 57, 87 can be decrypted.

4.4 Guessing last words with ciphertext only

Alas, most of the important information in letter 1 was missing, including city names, islands, or specific words that we had not encountered before. The extended part of the key we propose permits to read 96% of the numbers that appear. To extend this cipher table, we first decrypted letter 1 with the intermediate table obtained in Section 4.3, to get a letter with holes in it. First, we filled in the smallest holes (one or even two missing numbers), as well as those with numbers appearing elsewhere in the same letter. “Guessing” the value of the numbers is not done blindly: we always choose words that are in the vocabulary of Figure 3.

4.5 The key

The whole reconstructed key is in the Appendix. We report the confidence we have in the values attributed to the number: by default we are sure of the values but we mark with * those we doubt slightly. Typically, words guessed at the end, using the D’Argoût’s table, are marked with *. The dots ... mean that the value is not known yet. Besides, we found 8 nulls. Note that we expect the real Bellecombe’s table to be bigger than the one we reconstruct. If all the numbers between 1 and

this port a few days after the equinox, under the escort of...

³I can only announce that a convoy of forty-five to fifty sails will leave this port a few days after the equinox, under the escort of...

850 are assigned as in D’Argoût’s table, then we can estimate that we have reconstructed 36% of Bellecombe’s real table.

5 Results

Here is the first letter of Bellecombe, reconstructed as best we could.

5.1 Beginning in cleartext.

Au Cap, le 14 février 1782. Monseigneur, J’ai l’honneur de vous informer de mon arrivée dans cette colonie où je suis débarqué le 10 de ce mois.

“Cape Town, February 14, 1782. Sire, I have the honor of informing you of my arrival in this colony, where I disembarked on the 10th of this month.”

5.2 The decryption of letter 1

*Le même jour, il est arrivé un convoi espagnol por*tant* quatre *cent* *barques* de débarquement venant de 621 sous l’escorte de quatre vaisseaux de *guerre* et trois frégates ou corvettes. Le logement de nos troupes en garnison et celles de cette *flotte* vont nous créer bien de l’embarras, mais, nous espérons, Monsieur Bongard et moi, pouvoir les satisfaire. Je 791,e de *suite* à La Havane pour faire part à Dom Solano et à Dom Galvé de l’arrivée de nos forces et pour en*voy*er les dépêches de messieurs de 21 et de Bouillé qui contient probablement les *différentes* positions qu’ils ont *choisies* pour la campagne *marin*e et sur les *terre*s. Je ne dois pas vous laisser *penser* que je n’ai nullement été consulté. Je vais *par conséquent* faire l’*impossible* pour remplir ce qui m’est pre(s)cri par les ordres du *roy* concernant le *cla*n arrêté a *Versailles* *dont* je n’ai *connaissance* suivant *les* *excep*tions *qu* à la *lu*eur des 147,or,es. Arrivé depuis quatre jours dans la colonie, je ne puis, Monseigneur, vous rendre qu’un compte très sommaire de l’état où je la trouve ; il paraît qu’il y règne de l’ordre et de la tranquillité. Les trois régiments des troupes de 508 Gatinois en g,h,553 et Cambresis actuellement à 215, les deux régiments coloniaux et l’ 14,153,un,550,ta,l,843,540,c,tif d’à peu près cinq *cent* barques. Nous n’avons 448,ve encaissé *que* *cent* vingt-et-un 513,*douze* *cent* vingt-trois 483,s,718. Allons-nous *envoyer* une frégate à La Havane pour aller chercher des *ustenciles* en argent, ils sont*

*d'autant plus pressants qu'il y a peu de *marchandise* en ce genre dans cette *colonie* à ce que l'on m'a assuré. Nous avons en *provision* *douze* *mille* trois *cent* *dix* neuf *livres* de *farine*, trois *mille* trente *sacs* de *sucre*, trente cinq *sacs* de riz, treize *cent* six *livres* de salaison et *dix* barriques de *mauvais* vin *rouge*. L'arrivée des espagnols crée une augmentation de consommation qui va absorber bien vite nous approvisionnements. Le *seul* *bateau* du convoi de 385 et de celui de 167 qui *est* arrive est le Senault. La Marquise de Galart qui portait les *hommes* de Monsieur Bongard et les miens, poursuivi par deux frégates anglaises à l'entrée de cette rade où il a voulu se réfugier près du port de 712, où il a péri et on *croit* que *tout* est *perdu*. La Néréide et la Railleuse *sont* les *seuls* *bateaux* de *guerre* *que* nous ayons pour protéger le commerce sur la côte *méridionale*. On ne *doit* nullement compter sur les vaisseaux espagnols. Il ne partiront prochainement pas de la rade à moins qu'ils n'en reçoivent l'ordre de Dom Solano. *Aussi* le commandant de cette escadre a refusé de porter par mer ses troupes de débarquement près du fort du u,p,h,i,ou,je,au(x),544,517,e, *terre*,s,324,s,se,nt ac,807,pe une campagne à celle *qu'il* *attend* de La Havane.*

A translation could be: "On the same day, a Spanish convoy arrived, carrying four *hundred* landing *boats* from 621, escorted by four *war* vessels and three frigates or corvettes. The accommodation of our garrison troops and those of this *fleet* will cause us a great deal of embarrassment, but we hope, Monsieur Bongard and I, to be able to satisfy them.

I 791-e right away to Havana to inform Dom Solano and Dom Galvé of the arrival of our forces and to *send* the dispatches of Sire 21 and De Bouillé which probably contain the *different* positions they have *chosen* for the military campaign on land and at sea. I must not let you *think* that I was in no way consulted. I will *therefore* do my *possible* to fulfill what is prescribed to me by the orders of the *roy* concerning the clan arrested at *Versailles* *of which* I only have knowledge about exception (... something not readable there).

Having arrived in the colony four days ago, Monseigneur, I can only give you a very brief account of the state I find it in; it seems that

there is order and tranquility. The three regiments of 508 Gatinois troops in g-h-553 and Cambresis currently at 215, the two colonial regiments and the 14,153,un,550,ta,l,843,540,c,ti,f of about five *hundred* boats. We only 448,ve cashed *hundred* twenty-one 513, *twelve* *hundred* twenty-three 483,s,718. Are we going to *send* a frigate to Havana to fetch silver *ustencils*, they are all the more pressing as there is little merchandise of this kind in this *colony* as I have been assured. We have in *provision* *twelve* *thousand* three *hundred* *nineteen* *pounds* of *flour*, three *thousand* thirty *sacks* of *sugar*, thirty-five *sacks* of rice, thirteen *hundred* six *pounds* of cured meats and *ten* barrels of *bad* *red* wine. The arrival of the Spaniards creates an increase in consumption that will soon absorb our supplies.

The only boat of the convoy of 385 and that of 167 which has arrived is The Senault. The Marquise de Galart which carries the *men* of Monsieur Bongard and mine, pursued by two English frigates at the entrances of this roadstead where he wanted to take refuge near the port of 712, where he perished and we think all is lost. La Néréide and La Railleuse are the only war boats we have to protect trade on the *southern* coast. We *must* by no means rely on Spanish vessels. They will not leave the roadstead unless ordered to do so by Dom Solano. *Also* the commander of this squadron has refused to bring his landing troops by sea near the flat of the u,p,h,i,or, (something not readable...) a campaign he expected from Havana."

5.3 End in cleartext.

La voie dont je me sers pour vous faire parvenir cette lettre avec le duplicata de celle que j'ai eu l'honneur de vous écrire du camp de Monsieur de Bouillé à Saint Christophe est peu sûre, mais comme c'est la première qui se présente je crois devoir en profiter. C'est un bâtiment américain qui doit se rendre en Hollande. Je suis avec respect, monseigneur, votre très humble très obéissant serviteur Bellecombe.

A translation could be: "The means I am using to send you this letter with the duplicate of the one of the one I had the honor of writing to you from Monsieur de Bouillé's camp in Saint Christophe is not very safe, but as it is the first one I think I should take advantage of it. It is an American

ship bound to Holland. I am respectfully, mon-seigneur, your most humble and obedient servant Bellecombe.”

5.4 Content of the letters

The letter we have decrypted is the first letter that Bellecombe sent right after his arrival on Saint Domingue Island. We learn of the landing of large numbers of Spaniards on the island of Saint Domingue. Alas, this is causing concern for the governor, who is worried about how to feed all these men, in addition to those garrisoned there. In this letter, he gives a precise breakdown of the colony’s food supplies. He also points out that the Spanish troops stationed on the island will be of no help in defending it in the event of an English attack. We also discover the reason for the letter’s encryption: the author of the letter considers that the means of transport he uses is not very secure (it is an American ship), but he takes the risk of entrusting his mail to it, as it is the first ship to leave the island to Europe.

Conclusion: further reflection on directory-based encryptions

The preservation and completeness of the correspondence that reaches us remains uncertain: with only one eighth of the letters sent from Bellecombe preserved, it is fortunate that we were able to find identical passages that were sent (and preserved!) in both clear and encrypted form. A natural question that arose, and to which we have no answer at the moment, concerns the disappearance of encrypted letters. In wartime, when messages cross the ocean, the letters preserved in clear (e.g. letters 58, 59, 61, 62, 76...) may have been originally encrypted at least partially as well, especially given that the preceding and following ones have partially encrypted copies in other files. When and why did their encrypted counterparts disappear? From a cryptographic point of view, it was the presence of a clear/encrypted pair that enabled us to reconstitute the cipher table; but what would we have to do in the presence of a cipher-only attack? What methods were used at the time to attempt to penetrate the contents of letters protected by a directory-based encryption? How far can today’s hill-climbing and simulated annealing algorithms, which enable cryptanalysis of homophonic ciphers (Lasry, 2018), help us when we are dealing with ciphers with nomenclatures of the order

of a thousand values? Since those systems were used for more than two centuries, we encourage all code breakers to look into the matter.

About the name *directory-based encryption*.

We suggested this name because we feel that the current option *nomenclator* is not clear enough. Indeed, here is a quote from David Kahn’s *Code-breakers* that a kind reviewer pointed out to us. In the preface there is a small text on nomenclators: ”For 450 years, from about 1400 to about 1850, a system that was half a code and half a cipher dominated cryptography. It usually had a separate cipher alphabet with homophones and a codelike list of names, words, and syllables. This list, originally just of names, gave the system its name: nomenclator. Even though late in its life some nomenclators grew larger than some modern codes, such systems are still called nomenclators if they fall within this historical period.” The issues with the name *nomenclator* are the following:

- The word has several meanings (both the cryptosystem and the list of names) and this introduces confusion.
- As in current cryptography, systems must be named according to their mechanism and not the year or century in which they were used.
- Naming objects and ideas allows us to work with them, and is the first step towards understanding a concept. For example, the lack of distinction in the vocabulary (naming everything homophonic cipher) makes it impossible to distinguish between systems with very small nomenclators and those described here. The former are within the reach of modern algorithms for breaking them. The latter are not. If the attack algorithms are different, it’s because the inherent security of the defence systems is different. Wouldn’t it be worth naming these systems differently? Or do we want to keep all the cryptography that has been used for 450 years under the same name? Isn’t that a bit reductive?

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Appendix

Letter 57, cipher part: 566 837 205 779 225 492 850 65 661 444 587 195 850 529 88 824 658 2 780 660 598 779 555 63 725 185 850 468 799 209 757 221 352 396 672 53 74 138 253 296.779 664 610 175 352 460 196 850 725 837 359 813 195 354 495 842 468 460 495 195 310 548 625 523 29 211 113 725 850 604 282 813 195 420 850 677 745 278 604 396 492 46 747 831 779 496 572 599 560 412 445 221 244 523 12 555 187 2 599 72 779 113 495 669 664 566 832 273 488 492 282 683 juin 1782 172 460 495 354 495 842 468 779 97 850 856 352 790 542 527 669 77 72 460 132 404 850 185 784 501 51 186 819 797 88 779 629 313 725 1 850 779 133 186 140 790 664 852 282 450 484 273 761 211 696 289 63 725 185 352 468 757 209 765 221.487 460 824 819 850 484 273 761 211 696 289 63 725 185 716 819 411 200 716 850 790 489 824 790 493 534 779 813 396 799 221 460 614 x xii et xiii 44 495 360 790 706 850 725 813 211 492 534 664 113 779 16 850 790 489 311 629 757 60 725 677 273 735 738 316 689 185 273 115 172 460 140 813 145 714 340 113 492 534 272 399 195 310 1 779 2 664 566 819 352 779 813 672 747 354 221 460 614 v vi vii viii 44 495 360 790 706 207 411 489 466 850 viii 92 495 186 115 46 71 850 725 186 857 113 489 196 664 186 140 850 716 819 813 194 514 830 850 166 399 166 824 225 571 113 460 589 44 495 211 672 309 664 352 571 662 12 361 455 850 122.779 45 850 778 790 493 468 757 209 765 221 839 747 610 211 664 850 222 278 191 122 352 849 823

815 598 340 411 614 278 493 716 686 444 273 46 779 133 348 664 749 837 495 340 824 359 689 113 709 850 484 273 63 725 185 790 493 484 765 191 122 571 837 291 756 113 786 476 244 779 2 689 566 262 850 59 728 686.813 29 211 670 46 818 340 568 460 401 849 823 122 460 495 604 619 813 460 39 779 199 27 352 489 436 762 849 823 815 598 340 697 97.

La frégate marchande Le Maréchal de Mouchy 614 344 113 388 832 273 488 492 186 784 173 604 273 789 716 211 824 604 ce bâtiment 172 687 186 824 672 779 552 850 736 113 790 837 495 259 780 546 495 352 790 2 399 72 850 115 500 216 495 607 495.

Letter 87, cipher part: 657 389 114 399 756 113 736 580 185 273 254 572 614 344 194 850 716 610 530 233 92 495 408 779 664 571 185 759 489 12 745 672 850 285 181 493 623 495 505 779 97 839 399 340 566 39 779 199 27 352 850 849 823 815 598 340 778 850 686 399 492 808 529 211 818 610 211 790 54 365 344 313 53 74 296 666 838 592 48 340 598 779 730 499 666.

Letter 1, encrypted: 460 589 92 221 411 374 118 555 489 12 445 436 819 635 285 222 513 613 850 850 260 594 555 842 181 850 621 505 779 97 839 399 340 850 285 222 122 850 826 352 849 823 815 598 340 534 207 48 555 492 340 460 629 511 594 850 578 249 426 288 352 709 850 716 340 8 745 181 599 504 27 320 850 779 501 59 399 824 495 108 599 97 60 218 764 778 539 598 399 790 352 396 672 696 534 376 460 495 527 444 495 83 53 74 138 666 433.

850 578 249 426 288 352 709 850 716 340 8 745 181 599 504 27 320 850 779 501 59 399 824 495 108 599 97 60 218 764 778 539 598 399 790 352 396 672 696 534 376 460 495 687 791 689 850 326 113 786 46 83 614 244 484 747 63 725 185 352 113 484 747 488 416 555 850 779 374 118 555 664 850 578 354 495 352 46 426 94 27 460 495 546 495 850 780 282 434 495 850 21 352 850 25 534 221 460 571 12 444 412 800 818 59 120 594 460 495 103 610 282 444 813 572 560 104 46 725 797 747 39 450 641 664 352 313 460 495 465 495 734 756 484 823 844 736 29 259 644 236 172 657 273 113 672 187 779 460 594 523 12 205 779 340 734 468 823 179 83 779 84 46 399 501 49 399 716 571 747 411 200 275 492 614 460 495 423 566 827 12 254 842 181 460 55 273 496 113 480 527 221 460 495 406 657 273 16 825 85 527 273 716 487 551 437 444 813 394 194 725

435 434 195 147 48 97.

Arrivé depuis quatre jours dans la colonie je ne puis Monseigneur vous rendre qu'un compte très sommaire de l'état où je la trouve. Il, paraît qu'il y regne de l'ordre et de la tranquillité 460 495 849 823 837 453 594 495 195 249 850 508 598 444 185 823 412 488 289 553 352 797 747 51 282 495 147 82 749 594 113 215 460 495 310 837 453 594 495 839 629 661 186 352 779 14 153 489 550 225 779 843 540 207 444 587 790 113 662 200 604 273 789 513 613 599 842 745 764 448 555 412 797 823 211 538 243 832 273 488 492 489 513 378 425 243 832 273 488 492 849 823 483 495 718 416 629 764 599 791 27 489 815 598 340 194 786 46 416 460 399 272 399 272 399 195 526 412 374 511 181 221 63 181 790 763 115 200 527 181 495 572 672 113 662 850 364 412 716 488 412 837 72 716 492 340 675 113 716 175 779 813 686 113 495 205 837.

599 244 745 764 412 413 378 425 513 849 823 243 403 565 134 850 277 849 823 513 492 774 664 258 850 398 492 774 689 604 273 789 258 850 118 495 492 837 278 191 243 282 683 134 850 527 29 813 352 403 683 59 118 172 495 850 170 832 273 108 779 374 118 555 689 195 436 504 664 489 805 113 658 850 12 63 686 492 324 639 571 468 497 63 399 88 399 320 832 340 578 19 818 832 282 813 756 594 495 53 74 138 253 296 433.

460 729 463 566 12 745 672 850 385 352 850 830 850 167 571 336 374 118 555 411 460 211 842 799 779 492 725 686 399 595 211 850 598 779 374 492 571 819 637 460 495 475 850 778 114 273 598 399 790 352 460 495 199 412 495 46 358 832 614 310 815 598 340 851 97 113 779 2 664 850 716 492 340 824 850 221 194 745 799 809 211 837 395 453 27 200 566 819 850 712 534 221 244 60 118 352 813 302 175 516 411 263 566.725 756 837 278 850 352 725 824 684 779 460 799 211 847 460 495 729 463 850 826 538 599 113 672 813 46 818 340 515 399 460 401 313 725 1 627 813 756 405 187 779 460 594 663 399 313 460 495 122 436 221 756 812 344 560 66 756 594 844 850 725 824 850 113 622 572 273 412 837 839 684 140 779 423 850 484 747 63 725 185 280 460 839 747 686 273 142 850 716 492 340 45 113 837 395 211 850 819 27 614 677 360 249 850 790 664 260 594 200 566 316 388 757 696 289 278 534 687 186 544 517 493 465 495 324 495 211 181 145 807 60 489 797 747 696 605 756 113 709 750 54 492 412 405 850 986.

N°	Clartext	N°	Clartext
1	<i>côte</i>	103	<i>*différent(es)</i>
2	<i>entre</i>	104	<i>*choisi(es)</i>
8	<i>*flotte</i>	108	<i>*mais</i>
10	<i>*rouge</i> <i>or *blanc</i>	113	<i>a</i>
12	<i>con</i>	114	<i>bo</i>
14	<i>...</i>	115	<i>plus</i>
16	<i>*ai</i>	118	<i>*ri</i>
19	<i>*ap</i>	120	<i>*ble</i>
21	<i>a name</i>	122	<i>vaisseau</i>
25	<i>b</i>	132	<i>cou(r)</i>
27	<i>er</i>	133	<i>Amérique</i>
29	<i>lais</i>	134	<i>*livre(s)</i>
39	<i>pa</i>	140	<i>vent</i>
44	<i>bra</i>	142	<i>dant</i>
45	<i>escadre</i>	145	<i>ac</i>
46	<i>pour</i>	147	<i>ac</i>
48	<i>or</i>	153	<i>...</i>
49	<i>*pli</i>	166	<i>bu</i>
51	<i>bre</i>	170	<i>*mauvais</i>
54	<i>at</i>	172	<i>que</i>
55	<i>*cla</i>	175	<i>que</i>
59	<i>ba</i>	179	<i>*par</i> <i>conséquent</i> <i>or *inces-</i> <i>samment</i>
60	<i>pe</i>	181	<i>nt</i>
63	<i>so</i>	185	<i>no</i>
65	<i>fi</i>	186	<i>au(x)</i>
66	<i>*prochain</i>	187	<i>nu</i>
71	<i>venir</i>	191	<i>ze</i>
72	<i>dans</i>	194	<i>a</i>
77	<i>ront</i>	195	<i>des</i>
82	<i>tu</i>	196	<i>lieu</i>
83	<i>*faire</i>	199	<i>mi</i>
84	<i>*impossible</i>		
85	<i>*s</i>		
88	<i>be</i>		
92	<i>jour</i>		
94	<i>*voy</i>		
97	<i>es</i>		

Table 2: (Partial) reconstitution of Bellecombe's cipher table for the numbers between 1 and 199.

The key.

N°	Cleartext	N°	Cleartext
200	<i>pre(s)</i>	302	<i>*croit</i>
205	<i>su</i>	309	<i>ag</i>
207	<i>c</i>	310	<i>deux</i>
209	<i>dre</i>	311	<i>cha</i>
211	<i>se</i>	313	<i>sur</i>
215	<i>a location</i>	316	<i>*fort</i>
218	<i>ro</i>	320	<i>*bien</i>
221	<i>il</i>	324	<i>...</i>
222	<i>tre</i>	326	<i>*suite</i>
225	<i>ta</i>	336	<i>*est</i>
233	<i>quelque</i>	340	<i>te</i>
236	<i>*ser</i>	344	<i>ir</i>
243	<i>*cent</i>	348	<i>septentrional</i>
244	<i>a</i>	352	<i>et</i>
249	<i>troupe</i>	354	<i>force</i>
254	<i>cer</i>	358	<i>sui</i>
258	<i>a quantity like *sacs</i>	359	<i>uni</i>
259	<i>ser</i>	360	<i>ses</i>
260	<i>barque</i>	361	<i>tenir</i>
262	<i>détroit</i>	364	<i>*marchandise</i>
263	<i>per</i>	365	<i>ter</i>
272	<i>che</i>	374	<i>*ar</i>
273	<i>n</i>	376	<i>*voir</i>
275	<i>cri</i>	378	<i>*dou</i>
277	<i>*farine</i>	387	<i>*re</i>
278	<i>i</i>	388	<i>du</i>
280	<i>*aussi</i>	389	<i>me</i>
282	<i>si</i>	394	<i>qu</i>
285	<i>qua</i>	395	<i>*fu</i>
288	<i>garnison</i>	396	<i>mo</i>
289	<i>h</i>	398	<i>*sucre or *farine</i>
291	<i>tour</i>	399	<i>r</i>

Table 3: (Partial) reconstitution of Bellecombe's cipher table for the numbers between 200 and 399.

N°	Cleartext	N°	Cleartext
401	<i>commerce</i>	501	<i>em</i>
403	<i>*di(x)</i>	504	<i>*cre</i>
404	<i>(r)ant</i>	505	<i>sous</i>
405	<i>*doit</i>	511	<i>*ge</i>
406	<i>*dont</i>	513	<i>*mille</i>
408	<i>après</i>	514	<i>encore</i>
411	<i>est</i>	516	<i>tout</i>
412	<i>en</i>	517	<i>...</i>
413	<i>*provision</i>	523	<i>été</i>
416	<i>*al</i>	526	<i>*ustenciles</i>
420	<i>général</i>	527	<i>sa</i>
423	<i>ordre</i>	529	<i>li</i>
425	<i>*ze</i>	530	<i>rt</i>
434	<i>*eur</i>	534	<i>ou</i>
435	<i>*lu</i>	538	<i>*que</i>
436	<i>espagnol</i>	539	<i>*bon or *que</i>
437	<i>*excep</i>	540	<i>...</i>
444	<i>ti</i>	542	<i>Espagne</i>
445	<i>voye</i>	544	<i>...</i>
450	<i>gne</i>	546	<i>dépêche</i>
455	<i>beaucoup</i>	548	<i>nation</i>
460	<i>le</i>	550	<i>...</i>
463	<i>*bateau(x)</i>	551	<i>*les</i>
465	<i>*terre</i>	552	<i>honneur</i>
466	<i>affaire</i>	555	<i>ve</i>
475	<i>homme</i>	556	<i>France</i>
476	<i>jusque</i>	565	<i>neuf</i>
480	<i>ver</i>	566	<i>du</i>
484	<i>do</i>	568	<i>ger</i>
487	<i>suivant</i>	571	<i>qui</i>
488	<i>g</i>	572	<i>qu'il</i>
489	<i>un(e)</i>	578	<i>*nos</i>
492	<i>t</i>	580	<i>an</i>
493	<i>e</i>	587	<i>f</i>
495	<i>s</i>	589	<i>même</i>
496	<i>arrêté</i>	592	<i>cap</i>
		594	<i>ment</i>
		595	<i>qui</i>
		598	<i>ga</i>
		599	<i>nous</i>

Table 4: (Partial) reconstitution of Bellecombe's cipher table for the numbers between 400 and 599.

N°	Cleartext	N°	Cleartext
604	<i>ci</i>	697	<i>français</i>
605	<i>ag</i>	706	<i>eau</i>
607	<i>détail</i>	709	<i>celle</i>
610	<i>po</i>	714	<i>os</i>
613	<i>*barque</i>	716	<i>ce</i>
614	<i>par(t)</i>	725	<i>la</i>
619	<i>pi</i>	728	<i>ha</i>
621	a (likely) Spanish location	729	<i>*seul</i>
622	<i>*moins</i>	734	<i>je</i>
623	<i>voile</i>	735	<i>étant</i>
625	<i>ayant</i>	736	<i>vous</i>
627	<i>*méridional(e)</i>	738	<i>jamais</i>
629	<i>lo</i>	745	<i>vo</i>
635	<i>*ant</i>	747	<i>m</i>
637	<i>*ait</i>	749	<i>elle</i>
639	<i>on</i>	750	<i>qu'il</i>
641	<i>marin</i>	756	<i>ne</i>
644	<i>*pen</i>	757	<i>u</i>
657	<i>je</i>	759	<i>xe</i>
658	<i>tion</i>	761	<i>jo</i>
660	<i>de</i>	762	<i>avec</i>
661	<i>ni</i>	763	<i>*autant</i>
662	<i>peu(t)</i>	764	<i>ns</i>
663	<i>compte</i>	765	<i>u</i>
664	<i>e</i>	774	<i>*rent</i>
669	<i>semble</i>	778	<i>monsieur</i>
670	<i>ici</i>	779	<i>l</i>
672	<i>y</i>	780	<i>mes</i>
675	<i>*colonie</i>	784	<i>v</i>
677	<i>mer</i>	786	<i>La Havane</i>
683	<i>x</i>	789	<i>q</i>
684	<i>i</i>	790	<i>d</i>
686	<i>ma</i>	791	<i>*envoye(r)</i>
687	<i>je</i>	797	<i>ca</i>
689	<i>e</i>	799	<i>u</i>
696	<i>p</i>		

Table 5: (Partial) reconstitution of Bellecombe's cipher table for the numbers between 600 and 799.

N°	Cleartext	Null
800	<i>t</i>	53
805	<i>augment</i>	74
807	<i>...</i>	138
808	<i>el</i>	253
809	<i>*lu</i>	296
812	<i>*par(t)</i>	499
813	<i>on(s)</i>	666
815	<i>fre</i>	730
818	<i>pro</i>	
819	<i>port</i>	
823	<i>is</i>	
824	<i>ra</i>	
825	<i>*connai</i>	
826	<i>*guerre</i> or <i>*combat</i>	
827	<i>*roy</i>	
830	<i>celui</i>	
831	<i>ot</i>	
832	<i>vi</i>	
837	<i>re</i>	
838	<i>le</i>	
839	<i>co</i>	
842	<i>na</i>	
843	<i>...</i>	
844	<i>*pas</i>	
847	<i>*sont</i>	
849	<i>tro</i>	
850	<i>de</i>	
851	<i>*anglais</i>	
852	<i>curacao</i>	
856	<i>France</i>	
857	<i>cap</i>	

Table 6: (Partial) reconstitution of Bellecombe's cipher table for the numbers between 800 and 899, together with null symbols.