

A Turning Grille from the Ancestral Castle of the Dutch Stadtholders*

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Abstract

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ABSTRACT: In the archive of the Dutch Stadtholder William V an undated, unsolved message of unknown origin was found. This message is solved and placed in its historical context by correlating the contents of the message with known historical facts. It turns out to be an early example of a turning grille belonging to the correspondence of Stadtholder William IV.

KEYWORDS: Cryptanalysis, eighteenth century, Dutch history, Stadtholder William IV, transposition cipher, turning grille.

1 Introduction

The early history of cryptography cannot be based solely on an analysis of *printed* sources. Tempting though it may be to draw conclusions regarding the development of this field from classical masterpieces like those from Vigenère, Porta or others; they still have to be collated by an investigation into the actual use or application of the methods as described. This may lead to the conclusion, as Kahn has pointed out, that a complicated system like the Vigenère, while getting considerable attention in literature, was hardly ever used during the seventeenth and eighteenth centuries [13, p. 147]. It

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may equally show that some methods were applied only after considerable modification or even, that methods were applied long before its widely known description. This of course raises the problem of the interplay between theory and practice, or rather the question of whether these books played an innovative role in the development of cryptography or just a secondary one. There seems to be reason to assume the latter because the cryptographer of the early modern period was usually working on his own or within a small circle of colleagues and not allowed, or even inclined, to communicate his insights to others than to those directly involved. This question can only be solved by an exploration of coded or enciphered documents still to be found in many archives. They can give us a picture of the role cryptography actually played and will enable us to put ideas derived from printed sources to the test.

Dutch records cannot be excluded from such a survey. During the seventeenth and eighteenth centuries Holland played an important role in the development of merchant capitalism. It was involved in almost every major European conflict, but it had no appetite for territorial expansion and did not even want to play an independent role in the balance-of-power-politics so typical of this period.¹ The Dutch Republic, as the country was known at the time, could not do without ambassadors in all major capitals but it lacked the political ambition to spend more money on them than strictly needed. The operating of the diplomatic service could be cheaply run by sending diplomatic dispatches using the ordinary mail and using couriers only exceptionally, very much unlike the ambassadors of the great powers [1, p. 136–137].² This required a rather intensive use of secret writing that became more or less customary during the last decades of the seventeenth century and that was greatly improved during the second half of the eighteenth century. The role of ciphers and codes in Dutch foreign policy can to a large extent be recovered from the archives of the so called “States-General,”

¹With the exception of the last quarter of the seventeenth century when the country was governed by stadtholder William III of Orange who was to succeed to the British throne in 1688.

²This lack of willingness to spend money on courier services was not exclusively determined by the proverbial Dutch sense of economy. According to baron Fain [6] who acted from 1806 onwards as Napoleon’s personal secretary, ambassadors of small nations hardly ever used couriers of their own. Their letters were systematically intercepted at the Paris central post office and constituted, once decoded, the most valuable source of information on foreign diplomacy for the French government.

the principal government body and from those of the embassies.³

This survey should be supplemented by an investigation of the relevant material in the archives of the Dutch “Stadtholders”: semi-hereditary commanders of the army and the fleet who also had an important say in foreign policy. The examination of these records is, for the historian of cryptography, the most rewarding of all because of its great diversity. It can tell us not only something about the workings of the Dutch Black Chamber, but it also can give a picture of the role cryptography played in wartime. Moreover it furnishes examples of coded or enciphered documents that played a role in the safeguarding of the private interests of the Stadtholder and his family, in the Republic and abroad.⁴

In the archive of the last Stadtholder, William V, we found an unsolved message. It was stored with other ciphers and codebooks and had no reference either to sender or to addressee.⁵ A reproduction of the document on which it was found is presented in figure 1. From its appearance we concluded that it was enciphered with a turning grille.

2 Solution of the Cryptogram

The decipherment of the cryptogram did not present many difficulties. A glance at the letter distribution reveals a lot of ch’s, k’s and even an ck. It appears to be German and indeed, a closer look brings a few ü’s (see end of third and seventh row). We also note some capital letters in the upper left hand corner. They look like ‘CAVE’ and for the moment mean nothing to us. As it turns out we will be able to interpret them after the solution of the message is completed.

When we scrutinized the cryptogram for a point of entry, we recalled the warning already given by Cardano to users of transposition ciphers. One

³A separate article on the codes used by the States-General is in preparation. Interestingly enough, Dutch nomenclatures do not conform entirely to the general pattern. The principle of the two-part code, developed by Rossignol, seems not to have been known or appreciated until the second half of the 18th century. At an earlier stage secrecy was thought to be served best by the use of very large, one-part codes with many synonyms. Sometimes these could comprise of about ten thousand codegroups. For examples see: Algemeen Rijksarchief, eerste afdeling, familiearchief Fagel, inv. nrs. 1257–1266.

⁴For information concerning the Dutch Black Chamber see [21, p. 17–26; 2, p. 238–260; 5].

⁵Koninklijk Huisarchief, stadhouder Willem V, inv.nr. 339(7).

Alle
D r v u l g i r e f f e a l b f t e
m l w r a e a a r n e n c h t
h e z i t s o r s e t r e e u t
ch n e r t s s e g h e i s n t r t
e u d o n n l l l o k a l l e e u e n
n d w t a a i e b i e s d e r n
g d n i e e g h g m e w a u l i v
n l e n l e r g h h e e l n t e e
e r a b d i e u e t r a r n w s k a
l u c h e a n i l n d e e d i d h
e i e g e u r e s d e i r n t h e g e
a n m u a a e n n s n d d b w e n
a r o e h e e n h k l r o u e
m i l b l e m e e l e h n b e t
e m v i o d k g t o n n e n m t c
u m k a o e e c h m e b n i n n e g d

Figure 1: Reproduction of document. (size reduction to 80%)

should rewrite the message in such a way that the subsequent steps are indistinguishable [13, p. 144]. In the case of a turning grille, it is the turning operation that easily leaves traces in the form of different lines of writing. And indeed, this phenomenon is visible in this document. Looking at the first line we can see that [d, i, e] (1st, 5th and 11th position) are clearly at a lower level than the rest of the line.

On line six and following we find the most clear examples of a line of writing and we decide to start the analysis here. Denoting with (x.y) the y'th character on the x'th line (numbering from left to write and top to bottom), we collect e (6.8), i (6.10) and n (6.16). On the next line we easily continue with g (7.1), e (7.5), g (7.9) and a (7.13). On the eighth line the pattern is less clear, but we feel safe in taking g (8.8), e (8.12) and n (8.14) also. Together this results in the fragment “eingegagen”. We suspect here the word “eingegangen”, for which the missing n is supplied by either (8.1) or (8.4).

So the first entry yields a genuine German word. It is time for the litmus test, in the case of a turning grille this is the examination of the sequence of letters formed by the inverted positions. In the following table these are shown.

I	6.8	6.10	6.16	7.1	7.5	7.9	7.13	8.1/4	8.8	8.12	8.14
	e	i	n	g	e	g	a	n	g	e	n
II	9.3	9.5	9.9	9.13/16	10.4	10.8	10.12	10.16	11.1	11.7	11.9
	b	ie	r	w/a	e	l	c	h	e	s	i

First step in solution guessing ‘eingegangen’, I↔II = inversion.

We get the text “bierwelchesi” which could tentatively be split up in “bierwelches i”. It sounds like good German but we are not sure how to place this ‘beer’ in a secret message to a royal person.

Continuing the analysis we expand the fragment that begins on the sixth line with er (9.1), e (9.7), r (9.11), k (9.15), u (10.2), n (10.6), d (10.10) and i (10.14). This leads to “eingegangen ererkundi”, which sounds a lot like “eingegangener erkundigung”. This conclusion is reinforced by the position of the letters [g, u, n, g] on the next line. Again we seek the corresponding inverted positions, shown hereafter.

I	9.1	9.7	9.11	9.15	10.2	10.6	10.10	10.14	11.3	11.5	11.11	11.15	
	er	e	r	k	u	n	d	i	g	u	n	g	
II	6.2	6.6	6.12	6.14	7.3	7.7	7.11	7.15	8.2	8.6	8.10	8.16	
	d	a	s	e	n	g	e	l	i	s	c	h	e

Second step in solution, I \leftrightarrow II = inversion.

The message is becoming more and more fascinating. We can now read the words “das engelische bier welches”. There can be no doubt that we are solving the cryptogram but the contents become more and more intriguing. We plod on in order to find out what all this about English beer is. After a while we arrive at the two fragments

die franzosen sind laut eingegangener erkundigung und nachricht
vielleicht fürchten sie das engelische bier welches ihnen wohl übel

and then the solution is quickly completed, the two other rotational positions of the turning grille supplying the rest of the information. The key to the transposition is shown in figure 2. The solved message is as follows:

die franzosen sind laut eingegangener erkundigung und
nachricht von camberg abmarchiret es sollen aber dem verlaut
nach andere an deren stelle einrucken vielleicht fürchten sie das
engelische bier welches ihnen wohl übel bekommen durffte wan
es recht getruncken wird ich wünschet dass sie die rechte maass
bekommen mögten \ominus koenig

3 Dating of the Message

The use of a turning grille would point to the end of the 18th century because of the known popularity of this device at that time. Most notable in this respect is the contribution in 1796 of C.F. Hindenburg [11], titled *Fragen eines Ungenannten über die Art durch Gitter geheim zu schreiben*, the oldest complete description of the turning grille and written nearly a century before the well-known description by Fleissner von Wostrowitz [7]. Moreover most

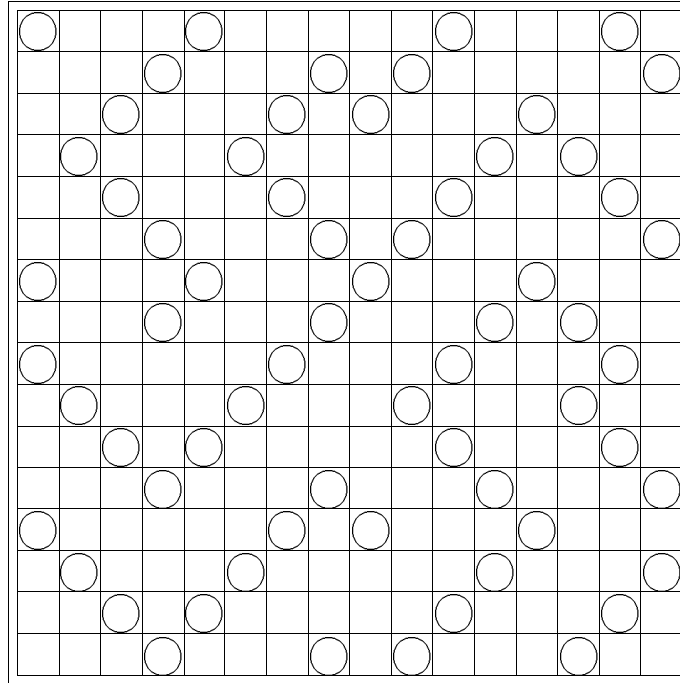


Figure 2: *Key to the transposition.*

ciphers and codebooks found in the archive of William V originate from that period.

Therefore it seemed very likely to us that the enciphered message had something to do with one of the wars caused by the French Revolution. The Dutch Stadtholder and his family were severely threatened by the new democratic tide that was flooding Europe. William V was nearly exiled by a Dutch democratic movement in 1787, but was at the last moment restored to power by the force of the Prussian army [14]. The Restoration Regime lasted only until 1795, when it was brought down by a French Revolutionary army. The Stadtholder was exiled to London and tried to protect his interests on the continent mobilizing an army of Dutch émigré's to reconquer the Republic.⁶ The mention of French troops seemed to point in this direction too. Of course, the other data in the letter still had to confirm this interpretation.

Subsequently we looked at the word ‘Camberg’, apparently the name of a

⁶A survey of this period in Dutch history is given by Schama [19].

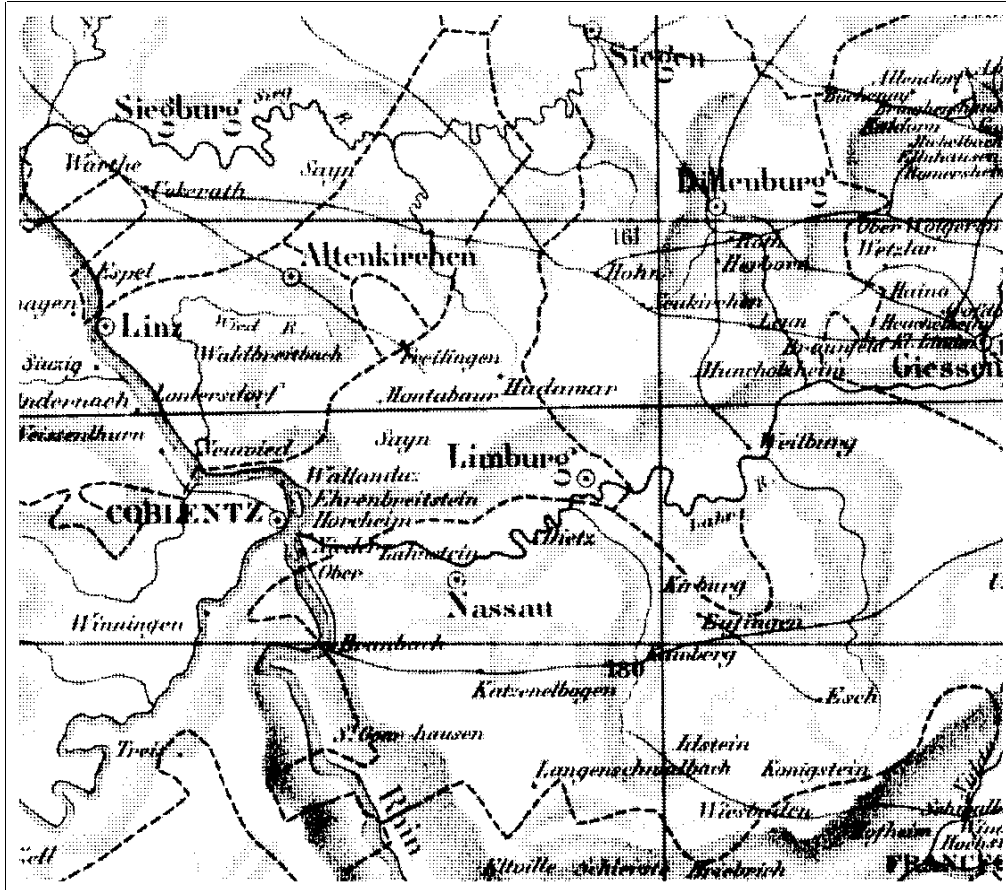


Figure 3: Area around Limburg a/d Lahn (source: Royal Library, The Hague).

village or town but not a very well known one and probably not in the Netherlands either. It turned out to be a village in the west of Germany not far from the river Lahn and cities like Koblenz and Limburg.⁷ In the 18th century it was part of the German possessions of the Dutch Stadtholders being from the line of ‘Nassau-Dillenburg,’ and their ancestral homeland. It provided them with the dignity of old nobility and with that of an independent ruler in the ‘Holy Roman Empire of German Nations,’ a loose confederation of states with an elected emperor at its head [12, p. 98–100; 17, p. 75–77]. This would

⁷See the map. In this map Camberg is spelled Kamberg. It is located to the right and downwards from Nassau, at the point where the lines on the map cross.

account for the fact that the letter was found in the archive of William V in the first place, and gives a hint of where to look for the writer, probably to be found among the officials of this German principality.

To be more precise we had to check whether there were any French troops in or near Camberg at all and, if so, when exactly. This last question could be solved relatively easily. From a local chronicle we learned that there were actually French troops at Camberg in the period that we had expected them to be there: during the revolutionary era from 1797 until 1799. The French had their commanding officers at nearby ‘Oranienstein,’ a beautiful baroque palace that was used as a residence by the Dutch Stadtholders when visiting their ancestral homeland [10, p. 18–40; 22, p. 33].

The next step was to find Mr. König. A list of civil servants of Nassau-Dillenburg showed that there was not one, but two officers called König strangely enough with the same initials. One was called Christian Andreas and the other Carl Anton. Suddenly the letters in the top left hand corner make sense. We should read them not as CAVE, but as CAK, the initials of both Carl Anton and Christian Andreas König. They both served as ‘registrators’ at the administration of the principality at Dillenburg, but not at the same time. Carl Anton was mentioned from 1751 until 1781 and Christian Andreas from 1780 until 1789. They were not mentioned later, that is to say in 1797 or 1798, but this need not necessarily mean that one of them could not have written the letter because these lists were not entirely reliable.⁸

Information from the ‘Hessian State Archive’ at Wiesbaden filled in the gaps. Carl Anton had already served the administration of Nassau-Dillenburg from 1744 onwards. He died suddenly in 1781 at the age of 71, his death being caused by a stroke.⁹ His son, Christian Andreas, was born on the 30th November 1749. He was serving the administration from 1772 onwards, at first as a lawyer and proctor. In 1780 he became a registrar, like his father, and in 1782 he became his successor. In August 1789 he left the service of Nassau-Dillenburg to become a secretary at the Chancellery of Copenbrügge, a town in northern Germany not far from Hannover.¹⁰

These results made the dating of the letter somewhere between 1797 and 1799 rather questionable. Of course Carl Anton could not possibly have

⁸Koninklijk Huisarchief, stadhouder Willem V, inv.nr. 339(31).

⁹Hessisches Hauptstaatsarchiv, Abt. 172, nr. 1902; Abt. 1001, nr. 61.

¹⁰Hessisches Hauptstaatsarchiv, Abt. 172, nr. 1905. We are indebted for this information to Mr. Eiler of the Hessisches Staatsarchiv.

written the letter during these years because he was no longer alive. But his son Christian was not likely to have written the letter either at that period because he no longer dwelled in the region.

A re-examination of the letter convinced us that we had been wrong. We had overlooked the importance of the part where the ‘*engelisches bier*’ was mentioned, apparently not liked by the French who were used to drinking wine. This statement could only have referred to stocks captured from British or at least Hanoverian troops, or perhaps to beer to be delivered to them by local breweries but confiscated by the French before it could reach its destination. This meant that the letter could not possibly have been written during the closing years of the 18th century because at that time there were no British or Hanoverian troops around. The Austrians were the only ones left to oppose the expansion of France on the continent after the peace treaty of Basel in 1795. The British were still in the war but they did not participate in the fighting that was going on in Germany, nor did the Hanoverians [17, p. 406].

In the middle of the 18th century the situation was completely different. During the War of the Austrian Succession, lasting from 1742 until 1748, British and Hanoverian troops played an important role in the war against France on German soil; see for instance [20]. The same can be said about the Seven Years War, that lasted from 1756 until 1763 [18]. Probably the origin of our letter goes back to one of these wars, which of course would make the elder König its author. The next step is to find data that link both the British and the French more closely to Camberg.

Let us first single out the Seven Years War. There was fierce fighting between the British and the French on the Nassau-Dillenburg territory during the years 1759 and 1760. As a matter of fact, the old ancestral castle of the House of Orange, the Dillenburg, was first occupied by a Hanoverian garrison and thereafter by a French one. In the course of the hostilities it was fully destroyed never to be built again [12, p. 139; 18, p. 174–188]. The fighting however was concentrated on the northern Lahn region and the area directly surrounding Dillenburg Castle, also more to the north. The French withdrew temporarily to the southern Lahn after the battle of Minden had not gone well for them. This took place in September 1759. They stayed in the southern Lahn region with 54,000 men until November 5th, when a new British and Hanoverian advance forced them to withdraw to Camberg, somewhat more south [16, p. 470]. The advance did not hold and on November 11th the French were back in Limburg, preparing for a new

attack on Dillenburg and its surroundings [18, p. 189–198].

It is therefore not fully excluded that our message dates back to that year but the phrasing seems to indicate a different direction. In the message one can find the statement “the French are leaving Camberg but others take their place.” This suggests some wavelike movement of troops, as if the French are flooding the country. In November 1759 this is not at all the case. The French withdrawal to Camberg was a more or less unique event. Fighting was concentrated in the area around Dillenburg more to the north, with the line of defence alongside the river Lahn as its most southern theatre. Camberg comes into the picture only once, and only haphazardly.

But there is a second reason why the message is not likely to have been written in the year 1759. At the time, Prince William V was only eleven years old. His father had already died in 1751 and his mother, Princess Anne, died in January 1759, about 10 months before the letter could have been written. It could only have been directed to Prince Louis of Brunswick, the guardian of the young Stadtholder. He had every reason not to take much interest in the well-being of the German principality of his pupil. His primary concern being to keep the Dutch Republic, whose territory had already been violated frequently, out of the war. It made perfect sense to separate affairs in Germany from those concerning the Republic [3, p. 496; 4, p. 159–161].

This leaves the last possibility, that the letter was written during the war of the Austrian Succession, lasting from 1742 to 1748. Mr. König entered the service of the House of Orange in 1744, so in this respect, it could have been written in that year. This would make Prince William IV the receiver of the message. It would mean that at some point in time the letter was filed in the wrong place, not surprising since it was not easy to read! Moreover, William IV is a far more likely candidate for having received the letter than his son. In 1739 the principality of Nassau-Dillenburg was reunified after having been divided into four parts for many years. The reunification was caused by the extinction of a side branch of the ruling family and it marked the beginning of a reorganisation of the government under the direct supervision of the Prince [12, p. 98-100]. William IV visited his principality regularly and while staying in the Republic, he was kept informed by means of his own courier service.¹¹

¹¹This can be derived from his correspondence with the governor of Nassau-Dillenburg, C.H. von der Lühe. See: Koninklijk Huisarchief, stadhouder Willem IV, inv. nr. 351. The courier or “estafette” is mentioned in a letter from 1745, september 18th in which he announces a forthcoming visit to his german principality.

The war of Austrian Succession brought much diplomatic manoeuvring. The Prince was married to an English princess and therefore tended to side with the Austrians or rather the ‘pragmatic alliance’ as the countries were called, wanting to uphold the rights of Maria Theresia, daughter of the last Habsburg emperor.¹² But he was a personal friend of Frederick the Great of Prussia too. Moreover, the French were never far away and he needed the support of the newly elected emperor (who was backed by the French) to get confirmation for his claims on his newly acquired territories [9, p. 91; 12, p. 98-100]. As a matter of fact, in 1743 (shortly before the Battle of Dettingen) the British did send a small army to Nassau, to prevent the Prince of Orange from getting too close to the French and their Bavarian puppet on the imperial throne [8, p. 88]. They were stationed, among other places, in Camberg and they were welcomed by the Prince who even applied for an office in the British army.¹³

This would account for the British but were there any French? At the time there were not, but from December 1744 onwards they were present; at least in the area [15, p. 485–486]. At the end of March 1745, the French commander of the Rhine army, Maillebois, concentrated most of his army here and even stationed his headquarters at Camberg, in order to prepare an attack on the area north of the Lahn. Hannoverian troops had already evacuated the area south of the river Lahn on March 16th but they had left allied garrisons at Diez, Limburg and at Ober- and Nieder Lahnstein, where the Lahn flows into the Rhine. These troops were withdrawn about two weeks later, respectively from Diez and Limburg on April 10th and 11th, and from the mouth of the Lahn on April 14th [15, p. 480, 494–495].

From this moment on, French troops were concentrated alongside the Lahn but fresh replacements were brought in to occupy the territory they left behind, most notably Camberg. The objective was to ensure that the allied forces north of the Lahn could not contact those in the south of Germany

¹²The letter mentioned in the previous footnote gives detailed instructions for the preparation of a meeting with Maria Theresia on the occasion of the crowning of her husband as German emperor in Frankfurt. The empress had to understand that the support she received from the British side was largely due to William’s interference! For his marriage to a daughter of George II see: [9, p. 20–28].

¹³Hessisches Hauptstaatsarchiv, Akt Abt. 356 VII 19. British presence in Camberg lasted from April until June 1743. It concerned grenadiers, respectively from the first, second and third divisions. In May, dragoons from the “Hongward” regiment were present too. In June they were joined by Hannoverian troops.

[15, p. 496–500]. The requisitioning lists informing us about the presence of the British troops give details relating to French troops too. They stayed in Camberg the last week of March and the first half of April and possibly longer because requisitioning continued to take place until the third week of May. The first wave consisted of infantrymen, dragoons from Limoges and some hussars, commanded by a Mr. de Biac; the second wave came in on March 30th, stayed until April 12th and consisted of regiments from Montboissier and Monaco, commanded by a Mr. d’Arnault. The men from Monaco stayed until the 17th. From April 20th until April 26th unspecified troops under Marquis de Bouzols are mentioned; this could refer to a third wave.

There are no records of captured stocks of beer but the French were short in supplies and the recurrent flooding of the Camberg area by troops is all too obvious to ignore [15, p. 494].

It seems highly probable, therefore, that our message can be dated somewhere during the month of April 1745.

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BIOGRAPHICAL SKETCHES

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