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DISUNION

The Codes of War

By **Terry L. Jones** March 14, 2013 12:15 pm

Disunion follows the Civil War as it unfolded.

Years ago, when I was working on my master's degree in history at Louisiana Tech University, an acquaintance allowed me to use the Civil War diary of Joseph W. Ely as the basis for my thesis. Ely, a corporal in the 19th Michigan Infantry, was captured at Thompson's Station, Tenn., and spent time in the infamous Libby Prison before being exchanged. He had his left ring finger shot off in the Atlanta Campaign and survived the March to the Sea and the Carolinas Campaign to return home and live well into the 20th century.

Most of the entries in Ely's diary are of the mundane type common in such journals. But there are some poignant and informative remarks made while he was on occupation duty in Tennessee and in the trenches during the Atlanta Campaign. What really caught my eye, though, were two short entries written using strange symbols rather than letters. I conducted some cursory research, but was unable to break the cipher before finishing my degree and heading to Texas A&M University for my doctoral studies.

For two years I wondered what Ely had written in his diary that he did not want anyone to read. Did he question his convictions, write ill of loved ones, or spend money on pleasures of the flesh?

Then one afternoon at College Station I was relaxing in my recliner, watching some old Looney Tunes cartoons. I was half asleep when I heard the announcer declare, “Hey, kids! Did you know that Civil War soldiers often wrote in code?” I opened one eye to see Joseph W. Ely’s mysterious cipher on the screen. Quickly grabbing a pencil, I managed to translate the secret entries in a matter of minutes.

I later discovered that Ely’s cipher is actually quite well known, and if the Internet had existed in 1978 I would not have fretted so much over breaking it. It is sometimes referred to as the Freemason Cipher, because Masons used it early in their history. I never discovered whether Ely was a Mason, or if he learned the cipher from comrades and just wanted to experiment with it (though I suspect the latter, because he used it so little in his diaries).

The cipher is based on two tic-tac-toe grids and two X’s, with letters being placed in the individual spaces and dots added in the latter grid and X to distinguish them from the first two. When using the cipher, the symbol that encloses the letter is used instead of the letter itself. The grids and X’s can also be rearranged (for example using grid, grid, X, X, instead of grid, X, grid, X) and the letters can be placed in a different order. The arrangement does not matter, as long as those using the cipher remember it.

There are other similar ciphers. One is known as the Rosicrucian, or “pigpen,” Cipher, in which two letters are put into each section of one grid and one X. When the second letter in a section is used, it is accompanied by a dot. Confederate agents operating in New York City used the Rosicrucian Cipher to communicate with government officials in Richmond.

Deception in transmitting information was common in the Civil War. Methods included using invisible ink, hiding tiny messages inside a pocket watch and secret ciphers and codes. Some ciphers, like the Freemason and Rosicrucian, replaced one letter with another letter or symbol. Codes, in contrast, substituted symbols, words or numbers for entire words, phrases or sentences. Codes were more secure because they were more difficult to break.

The famous rebel spy Rose O’Neal Greenhow allegedly used a cipher in 1861

when she warned Gen. P. G. T. Beauregard that the Union Army was advancing toward Bull Run, but neither of the two known encrypted messages has been discovered. When Pinkerton detectives arrested Greenhow, they found that she had made a critical mistake by not destroying some encrypted and deciphered messages. As a result, the Pinkertons were able to break the cipher she used.

Perhaps the most common method of Confederate encryption was a variation of the 16th-century Vigenère Cipher that used a table consisting of 26 alphabetized letters across and 27 letters down. Messages were encrypted by using the first line of horizontal letters to match the letters in the key phrase “Manchester Bluff” and the first line of vertical letters to match the message.

For example, if one wanted to encrypt the word “Jackson” he would find the first letter of the key phrase (“M”) in the first horizontal line and then the first letter of the desired word (“J”) in the first vertical line. Where these lines intersected gave the first letter of the encrypted word: “V.” By following this process, the word “Jackson” would read as “VAPMZSF.”

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

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

The Vigenère Cipher Table

Capt. Campbell Brown, who served on Gen. Joseph E. Johnston's staff during the early stages of the Vicksburg Campaign, divulged the secrets of the Vigenère Cipher in his memoirs and alluded to how difficult it was to use. "To my delight," he wrote,

Col. [Benjamin S.] E[well] taught me the cipher & the pass-word, or key-word, to read the dispatches that came. . . . I deciphered nearly all the messages from [Gen. John C.] Pemberton & from the War Dept. from 1st March till 1st May, 1863 — and, put most of the replies into cipher. The system was only to put the most important words of a message into cipher — & occasionally an unimportant one to mislead — so as to prevent detection. I may of course now mention the key-word then in use. It was 'Manchester Bluff.' The system I don't know the name of — it was on the principle of the 'asymptotes of the hyperbola.' It was tedious work to decipher — equally laborious to write in cipher.

In May 1863, Johnston was at wits' end dealing with Pemberton, the Confederate commander at the besieged city of Vicksburg. Ulysses S. Grant was maneuvering against the city, and Johnston kept insisting that Pemberton leave Vicksburg and attack, but he refused. Brown was given the task of deciphering

Pemberton's messages. "I never knew, in all my life, so provoking a stupidity as Pemberton's at this time," he wrote. "I remember translating a very long cipher dispatch from him, so utterly unimportant & ridiculous that Col. Ewell declared I must have made some mistake. So we went over it — I was right however."

Mistakes were, indeed, common in both encrypting and deciphering messages. During the campaign, Johnston sent a mangled encrypted message to Gen. Edmund Kirby Smith. After spending 12 fruitless hours trying to decipher the message, Kirby Smith finally dispatched an officer to Johnston to discover its meaning. The message was an appeal for reinforcements, but by the time the officer reported back to Kirby Smith it was too late.

When Vicksburg surrendered in July 1863, Union intelligence officers examined captured deciphered Confederate messages and successfully broke the Vigènere Cipher. The Confederates, however, soon realized that the cipher had been broken and simply changed the key phrase.

It was at least the second time Union cryptographers had managed to break the rebel cipher. Following the Battle of Shiloh, General Beauregard sent an encrypted telegram to inform government officials of the Army's weakness. Apparently, a Unionist telegrapher turned it over to the enemy. The cipher was broken and the message was eventually published in *The New York Herald*. When *The Richmond Examiner* copied the story, Robert E. Lee warned Beauregard to change his cipher.

A Vigènere Cipher table was found among John Wilkes Booth's possessions after he assassinated President Lincoln and in the office of the Confederate secretary of state, Judah P. Benjamin after Richmond was evacuated. These discoveries convinced some Union authorities that the Confederate government was involved in the assassination. However, the two cipher tables did not match. The first line on Booth's table began "ZABCD," instead of the usual "ABCDE."

It is now known that General Johnston utilized at least one other type of cipher and a code during the war. In some communications with Beauregard, Johnston used the Caesar Cipher, in which each letter in the message is replaced with the third letter beyond it in the alphabet. In the Caesar Cipher, the word

“the” would be encrypted “wkh.”

The code, on the other hand, was used to communicate with President Jefferson Davis and was based on duplicate dictionaries each man kept. Words were encrypted with numbers that referred to that word’s placement in the dictionary by page, column and word. For example, “division” was written as “265-2-10” because it was found on page 265, column 2, and 10 words down.

The Union Army also used ciphers and codes. Maj. Albert Myer, an army surgeon, played a key role in developing a workable system. Before the Civil War he wrote a thesis on sign language for the deaf and became interested in Indian smoke signals while stationed in the desert Southwest. Working with future Confederate Gen. Edward Porter Alexander, Myer developed the Army’s “wigwag” flag system. He also helped establish the Army Signal Corps and was appointed its chief in March 1863 with the rank of colonel.

During the war, both armies used signal flags and had their own distinct alphabet systems. Major Myer employed at least two different methods to substitute letters in his flag messages. One was to use seven different alphabets and change them each day of the week before starting over. Midway through the war, Myer also adopted a cipher disc for his signal flags. An alphabet was placed on two concentric discs, with one being the true alphabet and the other serving as the encrypted letters. The inner disc could be turned, resulting in different cipher letters matching up with the true alphabet in a predetermined manner.

Both armies were able to break the enemy’s flag alphabet throughout the war. At the Battle of Chancellorsville, Union intelligence officers knew the Confederate flag alphabet and discovered through intercepted messages that the rebels were also reading the Union signals. This put Gen. Joseph Hooker in an enviable position, because the Confederates did not know he knew their flag alphabet nor did they know that he was aware they could read his. In the end, however, the intelligence coup did not help, and Hooker was badly defeated. It also appears that the Confederates managed to break Myer’s disc cipher, because Robert E. Lee gave copies of the Union flag alphabet to his corps commanders during the Petersburg Campaign.

Anson Stager, the former general superintendent of the Western Union Company, was another important figure in the secret Civil War. A skilled telegrapher, he served on Gen. George B. McClellan's staff before being promoted to colonel and put in command of the Military Telegraph Corps. Stager controlled the Union's entire telegraph system and developed a code based on one used by Scotland's Earl of Argyle in his fight against the British some 200 years earlier. In Stager's system, the message's words were tapped out in standard Morse code, but they were transmitted out of order to make them gibberish unless one knew the decipher key.

To decipher the message, the words had to be rearranged on a grid of rows and columns. The first word in the message was the key that told the reader how to arrange the words in a predetermined vertical or horizontal manner. Some words were standard code words for important cities and individuals ("Lincoln" meant Louisville, Ky., and "Adam" meant Gen. Henry Halleck), and some were "nulls" or meaningless words designed to confuse anyone trying to decipher the message.

Pvt. Charles A. Gaston, a telegrapher serving in the 11th Mississippi and detached as a scout, intercepted Union messages encrypted in Stager's code near Petersburg in the last year of the war, but Confederate agents were unable to break the code. Some of the encrypted messages were even published in Southern newspapers with rewards offered to anyone who could decode them. Apparently, no one ever collected the money.

Comparatively little has been written on this aspect of the secret Civil War, and there is much to be discovered about the war's intelligence services, ciphers, and codes. And what dark secrets did I learn about Joseph W. Ely after cracking his cipher? Simply this: that he went to visit his friend Henry Brown in the hospital and bought a watch for five dollars.

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Sources: Michael Antonucci, "Code-Crackers," Civil War Times Illustrated (August 1995); Edwin C. Fishel, "The Secret War for the Union"; Terry L. Jones,

“The American Civil War” and “This Cruel War’ Joseph W. Ely and the 19th Michigan Infantry in the Civil War”; Terry L. Jones, ed., “Campbell Brown’s Civil War”; William A. Tidwell, with James O. Hall and David Winfred Gaddy, “Come Retribution: The Confederate Secret Service and the Assassination of Lincoln.”

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Correction: March 19, 2013

This article originally stated that Joseph W. Ely was captured at Spring Hill, Tenn. He was captured at Thompson's Station, Tenn.