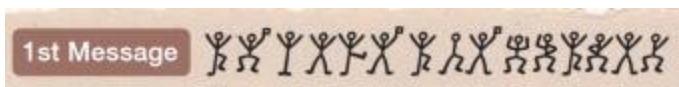


Lesson 4 Mysteries and Puzzles

Main Reading

The Adventure of the Dancing Men

With a heavy step, a gentleman named Hilton Cubitt walked into the room. He was carrying a piece of paper with strange symbols on it. He greeted Holmes and Watson, and then asked for Holmes's help in solving the mystery on the paper.



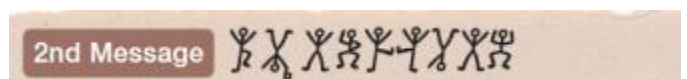
Holmes asked, "It seems to be a childish prank. Why do you think these stick figures are important?" Mr. Cubitt replied, "I don't, but my wife does. Those little men are frightening her to death. I must know what they mean." Holmes asked, "Could you kindly go over your story for me and my friend, Dr. Watson?"

Mr. Cubitt said, "Last year, I met a young American lady named Elsie Patrick in London. We quickly fell in love. One day, she told me that she had known unpleasant people in the past. She did not want to discuss them. Looking back, I should have asked about her past before. Nevertheless, we got married." He continued,

"Last week, I found those dancing figures on the window so I had them removed, but when I mentioned it to my wife, she became overwhelmed with panic and firmly insisted that we should not get rid of them. The next day, I found a piece of paper with the same message in my garden. When I showed it to Elsie, she turned pale and fainted. It was like she was trapped in a nightmare."

Holmes asked Mr. Cubitt if he had seen any strangers around. Mr. Cubitt said no, but he heard that some strangers were seen at Elrige's farm. "Mr. Holmes, you must help me find out what is frightening my wife!" He hopelessly cried. Holmes said, "I understand your concern, Mr. Cubitt, but we cannot act blindly. I suggest you take extra precautions to ensure the safety of your wife and yourself." Mr. Cubitt nodded with a look of resignation on his face.

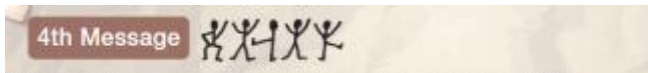
Two weeks later, Mr. Cubitt returned with a second message:



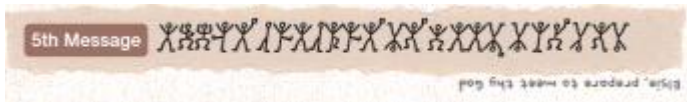
Two mornings later, a third message appeared.



Three days later, a fourth message was found. This message was special, since it was written in different handwriting. So, Holmes guessed that it was a message from someone else, most likely, Elsie.



Holmes carefully examined the four messages. He deduced that flags represented the end of words, and that the message was encoded using a Caesar substitution cipher, with each dancing figure corresponding to a letter of the alphabet. Five days later, a fifth message appeared.



Upon receiving the message, Holmes realized that the Cubitts were in immediate danger. Holmes and Watson rushed to the Cubitts' home, only to find Mr. Cubitt dead and his wife gravely wounded. Inspector Martin, a police officer, suspected Elsie to be the murderer. But Holmes thought a third person was involved. He wrote a note using the figures and asked a boy to deliver the message to Abe Slaney at Elrige's. Holmes said, "Inspector, I am certain Elsie is

not the criminal." The inspector asked, "How can you be so sure?" Holmes replied confidently, "Because I decoded the messages."

Holmes explained that the symbol represented the letter E because this was used the most in the messages and the most commonly used letter in the English language. Holmes continued, "The fourth message had two Es: □E□E□. It was a reply by Elsie, and the most probable one-word reply would be 'NEVER.'"

Holmes explained the third message, "It contained a five-letter word beginning and ending in E, with three letters in between. I thought it must be 'ELSIE.' That gave me the symbols for L, S, and I. The word before 'Elsie' had four letters, ending in the letter 'E.' I figured out that the word must be 'COME.'"

Holmes figured out that the first letter of the first message had to be A, and the H was relatively easy to decode. It becomes, "AM HERE A□ E SLANE□." By filling in the blanks in the name, the message read, "Am Here. Abe Slaney!" Holmes proceeded to decode the second message as "At Elrige's."

Holmes found out that Elsie was the daughter of a

Chicago crime boss, and Abe Slaney worked for him. They all shared the secret message writings. Elsie and Abe were even engaged in the U.S., but she ran away to England to start a new life. Holmes believed that this dangerous man still loved Elsie, and that was the cause of all the misfortunes.

Holmes's eyes were focused. He announced, "On that very night when I got the information about the two, Hilton Cubitt forwarded me the fifth message.

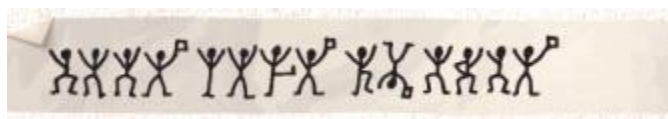
Watson, do you understand what this means?"

Watson replied, "Wait" A look of horror crossed Watson's face as he realized the implication. "'Elsie, prepare to meet thy God?' It's a threat!" Holmes nodded and his voice was grave, "Yes, that was why I rushed to the Cubitts' home, but I should have acted much faster."

murderer and he escapes while we are talking here...," the inspector worried. Holmes reassured the inspector, "Don't worry, he shall not escape. He should arrive here at any moment. Watson, do you remember the note that I asked a boy to send to someone? I pretended myself to be Elsie and he could not resist it."

Knock. Knock. Holmes warned, "Gentlemen, our man has arrived. Watson, have your gun ready!" The inspector slowly opened the door. Watson yelled "Freeze!" and the inspector arrested Abe Slaney.

As the case closed, Watson asked, "Holmes, what was the message that lured Abe Slaney?" Holmes silently smiled and showed him the message. "Read it, Watson."



"But Mr. Holmes, if Abe Slaney is indeed the

Extended Reading

Keeping Secrets Secret

Imagine you're a king or queen and everyone is trying to reveal your secret messages. What would you do to keep them safe? In ancient times, secret messages were hidden in hairdos, sewn into clothes, written under paintings, and slid into shoes. But no matter how well hidden a message was, it could still be read if it was found.

Julius Caesar — the legendary Roman ruler who was not only a military genius, but also an expert in encryption. Caesar had a secret code called "Caesar's cipher" which he used to keep his messages safe from his enemies. Here is how it works: you take each letter in your message and shift it a certain number of spaces down the alphabet, and the number of the spaces is called the "shift key." For example, if the shift key is 3, "a" becomes "D," "b" corresponds to "E," and so on. This is how "meet at the park" becomes "PHHW DW WKH SDUN!" Cool, right? Even if someone knows you're using Caesar's cipher, that person would have to try 25 different shifts to crack your code. Caesar's cipher is a time-tested secret code that has been used for centuries.

In more recent times, people have continued their efforts to keep secrets secret using various techniques. For instance, in the 18th century, people used code rings to keep messages hidden, and during World War II, a unique encryption machine called Enigma was invented. In the 21st century, a number of encryption techniques have been developed, utilizing computer science and internet technology. Indeed, the process of encrypting and decoding secrets has resulted in significant advancements in modern science and mathematics. How will secrets be kept hidden in the future? And how will they be revealed?

Critical Thinking

Are Algorithms Hacking Our Thoughts?

Have you ever searched for videos on social media?

Many of you have probably come across recommendations for similar content during your searches. You might also be familiar with the fact that giving a video a thumbs-up or thumbs-down can impact the recommendations you receive.

In our daily lives, we frequently invest considerable time exploring various options, comparing their features, and ultimately choosing the one that we like the most. However, the significant size of the online world can make it difficult to find the information we need. In such cases, algorithms have the potential to comprehend our preferences by analyzing our online behavior and make recommendations that best suit our preferences. This, in turn, could enable us to use our time online more effectively.

However, this convenience comes with a price.

Algorithms often require access to personal data, sparking privacy concerns. Furthermore, while they provide content that suits our preferences, this can narrow our exposure to diverse perspectives. Even with identical search terms, algorithms personalize search results. This raises concerns that algorithms may hack into our thoughts and behaviors!