Cryptography: Part 2: One-time Pads

Physics II: Modern Physics

College of the Atlantic

Here is a bit of a message that was encoded using a running key[1]:

`IIXAQTEHBTHBNZOX`

Subtract the word `THE` from each three-letter sequence in the ciphertext. That is,

$$\text{IIX} - \text{THE} = ? \tag{1}$$
$$\text{IXA} - \text{THE} = ? \tag{2}$$
$$\text{XAQ} - \text{THE} = ? \tag{3}$$

and so on, up to

$$\text{ZOX} - \text{THE} = ? \tag{4}$$
$$\tag{5}$$

Which of the resulting three-letter sequences could possibly be a part of an English word?

[1]This example was taken from Susan Loepp and William K. Wooters, *Protecting Information: From Classical Error Correction to Quantum Cryptography*, Cambridge University Press, 2006.