Three Patch Podcast – Episode 3

March Moriarty Madness

March 1, 2013

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243 Types of Tobacco Ash: Morse Code

Consulting Fan: Methleigh
– Consulting Fan Methleigh demystifies U.M.Q.R.A. with a explanation of Morse code.
– See [243 Types of Tobacco Ash: Further Information](#) for additional content

(Music intro)

> **Sherlock:** *All that matters to me is the work. Without that, my brain rots*

(Music fades)

Methleigh: Welcome to 243 Types of Tobacco Ash: Sherlockian Skills. My name is Methleigh, and I will be your host for this area of our show. In fandom I write about the ideas in Sherlock Holmes. I like to work to solve the Final Problem, as the show so nicely frames it. In addition, I cosplay Sherlock, and I am keenly interested in Sherlock's skills.

This month our topic will be Morse Code. In The Hound of the Baskervilles episode, John sees a light flashing on the moor and decrypts the letters U.M.Q.R.A. There is no actual Morse Code in the Conan Doyle stories themselves, though it was initially developed in 1836 by Samuel Morse, for whom it was named, in collaboration with Alfred Vail. Morse originally created it as a system of numbers and Vail introduced the use of letters and other symbols. It was in relatively common use by the 1890s.

It can be used by stroke victims who cannot speak or write. It is used for aircraft, ships, and in the military, by radio operators, both amateur and commercial. It is a standard in many areas of life, and would be more effective still were it understood by everyone.

Morse Code consists of series of dots and dashes each of which represents a letter. The most famous are the letters S and O as in the distress call SOS. The S is three dots and the O is three dashes. This is how they are written on the small diagrams you can use to memorize Morse code.

In practice, however, Morse code is (or was) sent with a telegraph key. Or, more informally and more useful for us, it can be sent by a signal light as John thinks it has been in Hound of the Baskervilles. Or it can be communicated by tapping, though this is more difficult. When Benedict was kidnapped in Africa he had said he wished he had known Morse Code when he was locked in the boot of the car.

This shows that Morse Code, even in a digital age, is useful so long as it is generally known. It is a way to communicate in the absence of voice, words, or electronic communication as long as one has a line of sight or is within range of sound.

In the original Hound of the Baskerville Stories, a light was raised in a window. It was raised once for the letter A, twice for the letter B, three times for the letter C, four times for the letter D, and so forth. Using such common letters as R, S, and T would have meant the lamp had to be raised eighteen, nineteen, and twenty times respectively. You can see how this would be a prohibitive system.

Morse code is much better designed.   The ease of the letters to transmit is based of frequency tables at the time Morse Code was developed. These are rankings of the letters of the alphabet in the order in which they appear most often, in this case in English. The easiest letters to remember and transmit are the most common. E is the letter which appears most often in an English passage. E is represented by a single dot.

Of course dots and dashes are not the literal way Morse Code is transmitted. You cannot draw a dash or a dot with a light, and you certainly not with a tap. A light is turned on and off. A hand or a foot or an object hits against hard object. So the transmission, or sending, relies on duration. A light is turned on for a longer time for a dash than for a dot. It is the same for a telegraph key, which makes an electrical connection, and which also makes a sound so long as the connection exists. A tap is much different, however.

A tap makes a single abrupt sound as it strikes a surface. The sound cannot be adjusted for length. You can try it yourself.

Practically, then, Morse Code relies on timing. Beats are determined to be dots or dashes according to the length of the spaces between them. And the beginnings and ends of individual letters can also be determined by the spaces between them. If a dash is longer than a dot, you may imagine this and demonstrate it to yourself with the familiar SOS pattern. Imagine yourself in a boot, kicking your foot against the metal above you. Three quick kicks for S, three long kicks for O, three quick kicks for S. You can try it, tapping on the table.

An E, as I mentioned, is a single quick tap then. A T is a single long tap. Imagine a pattern of three E's, three T's, and then three E's. Try it. EEET- T- T- EEE. How would you distinguish the difference between that pattern and the one for SOS?

It is based on rhythm. Imagine a metronome, measuring beats. In standard Morse code a dot is one beat. A dash is three beats. A space between a dot and a dash is one beat. A space between letters is three beats. A space between words is seven beats.

Try the pattern with the E's and T's again, tapping your foot for the metronome. E - space - space - space - E - space - space - space - E - space - space - space - T - ! - ! - space - space - space - T - ! - !- space - space - space - T - ! - !- space - space - space - E - space - space - space - E - space - space - space - E .

Now compare it to the SOS pattern. S - S - S - space - space - space - O - ! - ! - O - ! - ! - O - ! - ! - space - space - space - S - S - S.

You see, it is quite different, and the E-T combination is much longer when the spaces between the letters are added to the rhythm of tapping.

And that is how to transmit and read Morse Code when you are tapping. It is the same for a telegraph key, and the same for a light. Of course you can be innovative with light. You can turn a torch or a light-switch on and off. You can put your hand in front of a candle. You can reflect the sun with a mirror, even during the day. One can lengthen the speed by slowing the metronome, virtual or real. In effect this is increasing the length of time for a dot, as all other elements are based on the dot.

It takes quite a bit of practice to learn the rhythm, even once the letters have been memorized. This is true of both encoding and decoding. As is true of many things, to be effective the rhythm needs to be practiced until it is instinctual for it to be sure. John exhibits this level of practice. He simply sees the flashes and translates them into letters. The standard required for a Boy Scout Badge, for instance, is five words per minute.

Morse code can be sent in words, or it can be encrypted. The standard for a Second Class Commercial Radio License is 20 words per minute in plain text - in actual words, and 16 'words'

per minute, where the 'words' are seemingly random groups of letters. The record for copying Morse Code was set in 1936 and still stands at 75.2 words per minute.

It was usual for radio operators, aboard a ship of the era of the Titanic for instance, to be able to simply hear the transmissions as hearing words and sentences automatically, rather than breaking the transmissions into letters, they were so practiced.

Please visit our website to find a chart of the letters as well as links to sites where you can practice and learn.   There are also a variety of iPhone apps available.

Thank you very much for listening.

(Music outro)

John: *This is your living, Sherlock. Not 240 different types of tobacco ash.*
Sherlock: *243!*

(Music fades)

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Music
243 Types of Tobacco Ash: Camille Saint Saëns/ Performed by Kevin MacLeod, Danse Macabre: Danse Macabre – Violin Hook (get it here)

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