OLYMPIADS SCHOOL/GRADE 9 AND 10 WRITING/HANDOUT 9

Announcement

The midterm assessment is scheduled for Class 10 (i.e. next week's class). Please prepare for it by reviewing the handouts and marked homework.

PART A

VOCABULARY AND READING COMPREHENSION

Read the following discussion about the Enigma code. Explain the meaning of the underlined words. Either share your prior knowledge about the words or explain the context that enables you to guess the meaning of the words.

Breaking Germany's Enigma Code

By Andrew Lycett
Last updated 2011-02-17

The Enigma 'typewriter'

In 2001, the release of the feature film *Enigma* sparked great interest in the tweedy world of the boffins who broke Nazi Germany's secret wartime communications codes. But not all who watched Dougray Scott in the film's lead role realised that the title referred to a machine like a typewriter, which **encrypted** secret messages.

Fewer people still knew that this piece of spook hardware was invented by a German (based on an idea by a Dutchman), that information about it was leaked to the French, and that it was first reconstructed by a Pole, before it was offered to Britain's codebreakers as a way of **deciphering** German signals traffic during World War Two. As a result of the information gained through this device, it has been claimed, hostilities between Germany and the Allied forces were curtailed by two years.

The importance of signals intelligence became evident during World War One, as staff in the British Admiralty's Room 40, under Captain Reginald 'Blinker' Hall, worked at **intercepting** German communications.

Among these, famously, was the Zimmermann telegram - a message from the German foreign minister to his ambassador in Mexico City informing him of plans to invade the United States. On being notified of these plans, officials in Washington were understandably **perturbed**, and hastened to **effect** the entry of the US into the war.

Stealing secrets

After the Treaty of Versailles in 1919, the German defence establishment was eager to improve its compromised communications system, and recognised the potential of a signaling device that had originally been made for the business market.

Dr Arthur Scherbius had developed his 'Enigma' machine, capable of transcribing coded information, in the hope of interesting commercial companies in secure communications. In 1923 he set up his Chiffriermaschinen Aktiengesellschaft (Cipher Machines Corporation) in Berlin to manufacture this product, and within three years the German navy was producing its own version, followed in 1928 by the army and in 1933 by the air force.

Enigma allowed an operator to type in a message, then scramble it by means of three to five notched wheels, or rotors, which displayed different letters of the alphabet. The receiver needed to know the exact settings of these rotors in order to reconstitute the coded text. Over the years the basic machine became more complicated, as German code experts added plugs with electronic circuits.

Britain and her allies first understood the problems posed by this machine in 1931, when a German spy, Hans Thilo Schmidt, allowed his French spymasters to photograph stolen Enigma operating manuals, although neither French nor British cryptanalysts could at first make headway in breaking the Enigma cipher.

It was only after they had handed over details to the Polish Cipher Bureau that progress was made. Helped by its closer links to the German engineering industry, the Poles managed to reconstruct an Enigma machine, complete with internal wiring, and to read the Wehrmacht's messages between 1933 and 1938.

Ultra intelligence

With German invasion imminent in 1939, the Poles opted to share their secrets with the British, and Britain's Government Code and Cipher School (GC&CS) at Bletchley Park, Buckinghamshire, became the centre for Allied efforts to keep up with dramatic war-induced changes in Enigma output.

A host of top mathematicians and general problem-solvers was recruited, and a bank of early computers, known as 'bombes', was built - to work out the vast number of **permutations** in Enigma settings.

The Germans were convinced that Enigma output could not be broken, so they used the machine for all sorts of communications - on the battlefield, at sea, in the sky and, significantly, within its secret services. The British described any intelligence gained from Enigma as 'Ultra', and considered it top secret.

Only a select few commanders were made aware of the full significance of Ultra, and it was mostly used only **sparingly**, to prevent the Germans thinking their ciphers had been broken.

Despite providing some otherwise inaccessible information, it was some time before Ultra made any significant contribution to the war effort. Although, thanks to the information from the Poles, the British had learned to read parts of the Wehrmacht's signals traffic, regular decrypts only became possible in the Norwegian campaign - and then they were of marginal operational use.

Within a wider context, two Luftwaffe ciphers were broken, but the information gained was of little effective use. Similarly, Ultra's role in the Battle of Britain was limited: better grade intelligence came from prisoners, captured documents and improved air **reconnaissance**.

Only in 1941 did Enigma decrypts pay **dividends**. In the spring they provided evidence of a German military build-up prior to the invasion of Greece, although the Allies did not have a large enough military force to exploit this breakthrough.

In March, Bletchley's reading of the Italian navy's Enigma material helped Admiral Cunningham's Mediterranean fleet defeat the Italians at the Battle of Matapan. And in the autumn, the cryptanalysts broke ciphers used by Marshal Rommel's Panzer army, both within its own units and in communications with Rome and Berlin, giving the Allies an important advantage in North Africa.

Pinching the codes

By then the greatest threat to the Allied war effort came from attacks on their ship convoys in the North Atlantic. As a result, Bletchley's resources were concentrated on breaking Enigma codes used by German U-boats in this sphere of war. If the Allies could find out in advance where U-boats were hunting, they could direct their ships, carrying crucial supplies from North America, away from these danger zones.

So began one of the most exciting periods of Enigma code-breaking. Even in 1940 Bletchley had had some success in breaking Enigma keys used by the German navy.

It soon became clear that the best way of keeping up with rapid changes in ciphers and related technology was to capture Enigma machines and code-books on board German vessels.

In the Admiralty, where the Operational Intelligence Centre (OIC) was a leading user of Ultra, Commander Ian Fleming, Personal Assistant to the Director of Naval Intelligence, showed his talent for **fantastical** plots when he suggested a plan (known as Operation Ruthless) to crash-land a captured German plane in the English channel, and to overpower the patrol boat that came to rescue its supposed survivors, thereby gaining access to Enigma materials. The plan was never implemented.

A break-through came in March 1941, however, when the German trawler Krebs was captured off Norway, complete with two Enigma machines and the Naval Enigma settings list for the previous month. This allowed German Naval Enigma to be read, albeit with some delay, in April, by codebreakers at Bletchley.

Around this time, Harry Hinsley, a Bletchley codebreaker, suggested that German weather and supply ships, as well as war ships, probably carried Naval Enigma details. This idea was proved correct when, in May 1941, the German weather ship München was attacked and found with Enigma code-books for June on board.

The capture of the supply ship Gedania and weather ship Lauenburg in June yielded codebooks for the following month, and opened the way to the reading of Naval Enigma almost concurrently with events.

The ambush of three German U-boats off Cape Verde in September, however, coupled with a dramatic fall in the number of Allied ships sunk in the North Atlantic, led the German Admiral Karl Dönitz to question if the navy's cipher had been compromised.

Although he was **dissuaded** by his experts, the Germans redoubled their efforts to tighten Enigma's security, and the Bletchley Park codebreakers, realising what they were up against, wrote to British Prime Minister Winston Churchill complaining that they were not being given enough resources. Churchill replied with a famous 'Action This Day' memorandum: 'Make sure they have all they want on extreme priority and report to me that this had been done'.

Shortening the war

In February 1942 the Germans hit back by introducing a new fourth wheel (multiplying the number of settings another 26 times) into their Naval Enigma machines. The resulting 'net' was known to the Germans as 'Triton' and to the British as 'Shark'. For almost a year Bletchley could make no inroads into Shark, and Allied losses in the Atlantic again increased alarmingly.

In December 1942 Shark was broken, but German innovations meant that the Allies had to wait until August the following year before Naval Enigma was regularly read again. By then the Americans were active combatants, providing much-needed computer power to Bletchley.

By D-Day in June 1944 Ultra was no longer so important. But still no one wanted the Germans to sense that Enigma was being read. When, a few days before the Normandy landings, an American task force captured a German U-boat with its Enigma keys, Admiral Ernest King, US Commander in Chief of the Atlantic Fleet, threatened to court-martial the officer in charge for endangering 'Operation Overlord', as the plan for the D-Day landings was known.

By how much did Ultra intelligence, gained from reading Enigma ciphers, shorten the war? Harry Hinsley, based at Bletchley during the war, suggests it was a significant asset. If it did not keep Rommel out of Egypt in 1941, it certainly did so the following year, by preventing him exploiting his victory at Gazala.

As General Alexander put it, 'The knowledge not only of the enemy's precise strength and disposition, but also how, when and where he intends to carry out his operations brought a new dimension to the prosecution of the war.'

The loss of Egypt in 1942 would have set back the re-conquest of North Africa and upset the timetable for the invasion of France. According to Hinsley, Overlord would probably have been deferred until 1946.

But by then the Germans might have hit back with V-weapons and worse. Enigma successes always needed complementing with other intelligence material, but the fact that the Allies kept Enigma secret until 1974 shows how much it meant to them.

PART B

ESSAY-WRITING SKILLS: NARROWING THE TOPIC

Independent Writing. Teresa D. O'Donnell and Judith L. Paiva. 2nd edition. Boston: Heinle Cengage Learning, 1993.

How do we develop skills to write the body of an essay? This requires organizing your ideas. An outline is a tool to help you. It can be prepared before you write a draft of your ideas, or it can be used to organize or reorganize notes and first drafts. Remember, an outline is a tool. Like an essay, it must be revised to suit your purposes.

As you select and narrow your topic and write an effective thesis statement, you will find many ideas related to your topic. Don't let these ideas get away from you. Jot them down on a piece of paper as quickly as possible to use as supporting statements. Continue add to your list until you have exhausted all possibilities. Don't worry about writing down too much at this point; you can always discard irrelevant ideas or less important statements later. Remember: It is easier to omit less important details after you start to write the body of your essay than it is to try to come up with new supporting material for an essay that is turning out to be too short or is not adequately developing your thesis statement.

Practice

Watch the short documentary, Michael Brooke's "The Petard Pinch": https://www.shortoftheweek.com/2015/12/29/the-petard-pinch/[i]

In the box below, brainstorm as many possible topics in relation to "The Petard Pinch" as you can.

Next, focus on a topic. Which topic have you chosen to focus on? Complete the sentence below…

My essay will be about _____

_____

_____.

Now you are ready to jot down as many ideas related to the topic as possible. Keep adding to your list until you have exhausted all possibilities:

Next, group your ideas from your list on page 5. Organize your ideas into at least three categories that link back to a thesis statement. (You may wish to work backwards by refining your “categories” and then decide how your thesis statement will contain them.)

Thesis statement:_____

_____

Category 1:_____

Idea A:_____

Idea B:_____

Idea C:_____

Category 2:_____

Idea A:_____

Idea B:_____

Idea C:_____

Category 3:_____

Idea A:_____

Idea B:_____

Idea C:_____

Conclusion:_____

_____

Congratulations! You have an outline!

[i] The breaking of the German's Enigma Code was a crucial piece of Allied intelligence work during the latter stages of WWII, widely considered to have taken years off the war, thereby saving millions of lives. The recent film *The Imitation Game* focused on Alan Turning and his part in the cryptography team working at Bletchley Park, but there are many unsung heroes behind that moment of victory (just ask the Polish), and the courage of three British seamen is the subject of *The Petard Pinch*.

Commissioned by Bletchley Park Trust, the film tells the story of the recovery of vital documents from a stricken German U-boat. While the crew of U-559 abandoned their sinking vessel, First Lieutenant Tony Fasson, Able Seaman Colin Grazier, and the 16-year old canteen assistant Tommy Brown, swam from the HMS Petard to recover any relevant documents they could find, regardless of risk to themselves. Untold for decades, it is a story of duty and matter-of-fact selflessness, and the film captures this well, telling it in a very direct fashion without the need for spectacle or sentiment. With the mix of dramatic retelling and documentarian tone, *The Petard Pinch* feels heroic and engaging, touching on both the individualism of the act, and its global impact.

It is the animation that grabs you at first. Influenced by the propaganda posters of the 1940's, and the colorful work of British graphic artist Brian Cook, the animation mixes 2D, 3D, traditional cel animation, treated footage & photoshop brushes. Speaking by email, director and animator Michael Brookes tells us it took 3 months to complete, including experimentation in new software, lots of research work, and at one point filming himself jumping off a piano stool for reference. The result was worth the work, as the film plays out with effective imagery which feels both modern but yet of the period.

The film is part of a fuller exhibition in Hut 8 at Bletchley Park, and you can see more work from Michael Brookes on his website. (https://www.shortoftheweek.com/2015/12/29/the-petard-pinch/)