Measuring Mental Fitness: Government IQ Tests during World War I

When the U.S. Congress declared war on Germany on April 6, 1917, the president of the American Psychological Association (APA), Robert Yerkes, moved quickly to ensure that psychologists would be given a role to play in the war effort. “In the present perilous situation,” Yerkes wrote in an urgent message to the APA council, “it is our duty to cooperate to the fullest extent and immediately toward the increased efficiency of our Army and Navy.” During his intense lobbying effort in the month of May, Yerkes convinced the top brass in the U.S. Army (though not the Navy) that psychologists could be of service in sorting and categorizing the millions of raw recruits that the government was rapidly drafting into the military. Yerkes promised the army that experts in the new field of intelligence testing could develop and administer exams precise enough to match each recruit’s mental abilities to the right military job.

Wartime often presents opportunities for scientific and technological experts to try out new methods in the name of improved military performance. The beneficiaries of such experiments vary. In the case of intelligence testing in World War I, it was not the army or the soldiers who particularly benefited from the program. Instead, the two groups that profited from the army tests were professional psychologists, who gained new legitimacy from their high profile in wartime, and those political activists who used the psychologists’ interpretations of the tests to claim that the racial superiority of white people from northern and western Europe was now a proven scientific fact. So while army officials at U.S. military training camps in 1917 and 1918 doubted that written tests administered by a bunch of “mental meddlers” from university psychology departments could tell who would make a good soldier or officer, plenty of civilians during and after the war embraced the results of the army’s mental tests in order to advance their own professional and political interests.

The military draft instituted at the start of America’s participation in World War I put over four million men in uniform. Thirteen percent of those soldiers were African American, and 20 percent were foreign-born who represented at least forty-nine different foreign languages. The vast majority of draftees were under the age of thirty, and 70 percent worked as either farmhands or manual laborers. Among white native-born recruits, the median number of years in school was 6.9; among immigrants, it was 4.7; and among Southern blacks, half had less than 2.6 years of schooling. One sample of white native-born soldiers found that only 18 percent had attended high school and most had not graduated. Given this profile, it is not surprising that close to a quarter of those drafted into the U.S. Army were classified as illiterate in English.

Two different sets of tests were administered to the recruits: “alpha” tests for those literate in English and “beta” tests for those not literate in English. Robert Yerkes and his colleagues in the psychological testing movement were insistent that the test questions they asked of this diverse and minimally educated population of recruits were free of cultural and educational bias and would measure only “native intellectual ability.” While admitting that school experience had some influence, Yerkes insisted that “in the main the soldier’s inborn intelligence and not the accidents of the environment determined his mental rating or grade.”

These references to “native intellectual ability” and “inborn intelligence” are cues that Yerkes, like his colleagues Lewis Terman and Carl Brigham, subscribed to a “hereditarian” view of mental ability. According to this view, intelligence was a unified, universal human characteristic that was passed genetically from parents to children. Like height or weight, intelligence could be measured by a standardized instrument, like a yardstick or a scale, and that instrument – the mental test – could be reliably administered, regardless of the cultures or life experiences of the test takers. Indeed, it was Lewis Terman who invested the notion of the “intelligence quotient,” or IQ which was derived by dividing a person’s test score, expressed in terms of “mental age,” by the person’s actual chronological age. According to hereditarians, an individual’s IQ revealed the mental capacity transmitted in the family genes.

Not all psychologists in these years were hereditarians. Some took the “environmental” position that the defining fact of life is the unique capacity of human beings to be influenced, for better or for worse, by their environment. Environmentalists therefore argued that an individual’s performance on a mental test reflected that individual’s life experience and education as much, if not more, than it did the individual’s genetic inheritance. This position did not mean that environmentalists opposed the use of mental tests. In fact, Alfred Binet, the French researcher who first developed a standardized intelligence test, was a staunch environmentalist. But Binet took the position that tests of mental abilities could describe only a single individual’s intellectual ability; tests could not reveal the genetic or
environmental causes of that ability but could be useful for diagnosing and treating an individual’s learning problems. Binet opposed the administration of mental tests to large groupings of people or the use of such tests to generalize about the mental abilities of whole categories of people.

World War I gave those U.S. psychologists devoted to intelligence testing a chance to convince the American public that testing was a valid and useful social practice. Given that opportunity, psychologists temporarily tabled their debates over heredity and environment and stifled their differences over individualized versus group tests. Only after the war did the environmentalists realize that the hereditarians had taken control of the national discussion about mental testing and intended to use the results of the wartime tests to support the political view that certain categories of people were inherently more intelligent than other groups and, thus, more worthy of admittance to the United States as immigrants or more worthy of receiving tax dollars for their segregated, all-white schools.

Hereditarian psychologists like Yerkes, Terman, and Brigham drew directly from the aggregate results of wartime tests when making their postwar arguments for inherited, categorical differences in human intellectual abilities. By the time the war ended in November 1918, psychologists based at twenty-four training camps around the United States were administering 200,000 tests per month. All told, close to half of all soldiers drafted into the wartime army, about 1.75 million, were tested before shipping out. Both the alpha and beta tests were scored on a point scale that was converted into letter grades ranging from A to E. An “A” signified that the individual was “a high officer type”; a “B” suggested “splendid sergeant material”; a “C” indicated that the subject was a “good private type, with some fair to good NCO (noncommissioned officer) material”; those who scored a “D” were “usually fair soldiers, but often slow in learning”; and those who scored a half-grade lower than “D” were thought to be marginally fit for regular service. If a recruit scored a grade of “E” he was declared unfit for regular army service.

When reporting to the American public about the army’s wartime mental testing program, Yerkes and his colleagues did not emphasize the weak correlation between test scores and army officers’ independent assessment of their soldiers’ intelligence. Nor did they discuss the fact that army officials often ignored the testers’ recommendations when placing soldiers in jobs. Instead, they pointed to the broader social implications of the tests, alerting the public to the fact that only 12 percent of the recruits tested scored in the “A” or “B” range and that the translation of recruits’ intelligence scores into “mental age” indicated an average of just over thirteen years. The mental age for “normal” intelligence was set at sixteen years, while a “moron” was defined as an adult performing intellectually at a mental age below twelve years. So the hereditarians’ first claim was that the tests revealed an alarming number of morons in the young, male adult population of the United States in 1918.

Environmentalists interpreted this test result as evidence that the United States had a serious educational problem, noting that 86 percent of native-born white recruits were literate enough to qualify for the alpha test, but only 44 percent of foreign-born recruits, 67 percent of Northern blacks, and 35 percent of Southern blacks qualified. The hereditarians said the pattern of intelligence scores was the same for both alpha and beta tests, so literacy due to schooling was irrelevant. In this published discussions of the tests, both Yerkes and Brigham presented charts showing that 13 percent of all native-born white test takers ranked in the “A” or “B” range, but only 4.6 percent of foreign-born whites scored that high and just 1.4 percent of African Americans placed in those ranks. They then noted that only 24 percent of native-born whites scored in the “D” to “E” ranks while 44.6 percent of foreign-born whites sank to that level and fully 67.5 of African Americans were in those low ranks. Yerkes and Brigham denied that practice with test taking in school accounted for these differences in scores, arguing instead that “native intelligence” was the original factor determining “continuance in school.” They similarly denied that a health factor like hookworm disease, common among Southern blacks, could explain these low test scores; on the contrary, they said, it was innately low intelligence that caused the poverty that produced such health problems.

In presenting the test results to the public, the hereditarians also had to explain the fact that immigrants scored higher the longer they had been residents in the United States. Hereditarian psychologists denied that this meant individual experience influenced the test results. Instead, they produced more charts, matching foreign countries to test scores, in order to argue that it was not actually length of stay in the United States but country of origin that determined test performance. This was a politically significant argument because anti-immigrant activists at the time were claiming that “old immigrants” – those from northern and western Europe – were intellectually superior to the “new immigrants” from southern and eastern Europe, who had been arriving in much greater numbers since 1900. According to Brigham, the immigrant “group coming to this country in the years 1903 to 1907 had a higher average intelligence than the 1908 to 1912 group, and a lower average intelligence than immigrants coming to this country 1898 to 1902.” Thus, the hereditarian psychologists interpreted the
army mental test score in a way that supported those political activist, known as “nativists,” who wanted to restrict the number of new immigrants coming form southern and eastern Europe on the grounds that they were, quite literally, morons.

When the U.S. Army originally agreed to bring Robert Yerkes and his colleagues into military training camps to administer mental tests, it had no intention of providing hereditary psychologists with a huge tax-supported laboratory in which to rest their nascent theories of innate intelligence. Rather, the army hoped to increase its efficiency in processing and placing millions of raw recruits in suitable military jobs. In the end, no one claimed that the army’s goals had been achieved, but many agreed with James Cattrell, Columbia University’s premier psychologist, when he said that “the army intelligence tests have put psychology on the map of the United States, extending in some cases beyond these limits into fairyland.”

There are at least four research questions that would prompt a historian to take a close look at the tests administered to army recruits during World War I. A historian of science studying the ways in which cultural attitudes shape scientists’ assumptions would want to examine these questions for evidence of what the biologist Stephen J. Gould termed “the tenacity of unconscious bias.” So, too, a historian of science, particularly of the field of psychology, would need to be well acquainted with the types of questions used in the army tests in order to make comparisons with intelligence tests used before and after the war and to discuss the evolution of test design, the scientific and cultural assumptions influencing design, and the methodological errors and corrections made in test design over the years.

A social historian interested in showing the ways in which cultural prejudices about race and ethnicity were expressed in actual practice might very well examine the interpretations of the test results in the postwar writings of Yerkes and Brigham and others. Although the social historian’s focus would likely be on the use of the test results to advocate for specific laws and policies, a familiarity with the tests themselves would greatly strengthen the historian’s discussion of the cultural climate that fostered mental tests, race segregation, and immigration restriction. Finally, a historian trying to capture the lived experience of the young men drafted into the U.S. Army during World War I would undoubtedly read through the tests and probably try to take a few of them, if only to attempt bridging the gap that separates those raw recruits from the historian writing about them.

A historian would want to peruse tests like the “digit and symbol” test for illiterate recruits such as the one shown below from Robert M. Yerkes, *Psychological Examining in the United States Army, Volume 15, Memoirs of the National Academy of Sciences*. In the actual test, the men were presented with six double rows of fifteen boxes and given the “key” for filling in the empty rows. Each recruit was allotted three minutes to fill in all ninety boxes. To better understand how a recruit might have felt when taking the digit and symbol test, give yourself thirty seconds to fill in these fifteen boxes, using the key provided.

For anyone writing a history of intelligence testing in the United States, the army tests are an invaluable primary source because they show what the test designers regarded as an unbiased tool for measuring “innate” intelligence. The tests are, therefore, a tool for measuring the cultural blinders worn by many psychologists early in the 20th century, helping the historian to illustrate the assumptions shared by prominent researchers at the time.

There are, however, disadvantages to working with intelligence tests, and historians must exercise caution when studying these tests in isolation from other types of sources. For the historian of science, the tests do not entirely speak for themselves; additional knowledge and information would be needed in order to fully analyze these tests or tell a complete story about their creation. All historians of science must be trained to understand the research methods and research reports of the scientists they are studying, so any historian of psychology who wanted to analyze the army tests as one step in the evolution of the profession’s approach to testing would need independent knowledge of the assumptions, strategies, methods, and fallacies that govern intelligence testing, as well as access to tests that preceded and followed the army tests.

A historian of psychology who wanted to narrate the story behind the army tests would need a different set of supplementary material. The tests themselves, for example, cannot reveal that before the war, Robert Yerkes actually criticized Lewis Terman for designing group tests that did not adequately separate school skills from what Yerkes called “innate”
intelligence. Letters and memos from the early months of the war are needed to show that Yerkes chose to put aside his scientific disagreements with Terman because Terman had created the only fully operational, easily scored group test available – and Yerkes was late in delivering the tests he had promised to the army. The tests themselves are valuable for seeing what the available testing method was in 1917, but the tests do not reveal Yerkes’ professional and political motivations for adopting an instrument he knew to be flawed. Nor can the tests reveal errors in the scoring methods used by Yerkes and his team. For example, as a scientist, Yerkes knew that scores of zero indicated the test was invalid in some way, either because the test taker had not understood instructions, or had not known how to use a pencil, or was too flustered to address the assigned task in the few minutes allotted. Looking at the tests can help the historian understand how zero scores might occur, but, again, reading the memos between Yerkes and the psychologists at the camps is necessary for an understanding of how the pressure of time, the lack of adequate funding, and the desire to keep the program operating caused Yerkes to include zero scores in the final results and thus compromise basic principles of scientific methodology.

The historian interested in tracing the ways that cultural prejudices get translated into tangible social policy would find in the tests a gold mine of evidence. Like the historian of science, the social historian could analyze the class and ethnic biases that produced a series of tests the designers regarded as bias-free and could use that analysis to discuss the cultural gap between the intellectual elite in U.S. society and those they intended to study and serve.

But the tests alone would not suffice for the historian writing about the various interest groups in the United States who later used the test results to argue for immigration restriction or to blame the low intelligence of nonwhites for their lack of education. Here, again, the tests would provide ample illustrative data, but the historian would need the psychologists’ written analyses of the test results to get the full spectrum of attitudes that informed the testing process. For example, the tests themselves make clear that army recruits had very little time in which to complete each section; speed was the essence, which critics said was a factor confounding the results. By reading Carl Brigham’s 1922 report on the tests, however, the historian learns that the tests’ defenders were untroubled by the charge that the “hurry up” aspect of the test might skew an immigrant’s performance. Brigham argued that such a “hurry up” quality was “typically American” and therefore a “fortunate” feature of the testing situation. According to Brigham, “ability to adjust to test conditions” was part of “our definition of intelligence,” so if the immigrant army recruit was unable to adjust to a “typically American,” “hurry up” situation, then that recruit lacked the sort of innate intelligence desirable in the army – and in the United States in general. A historian would need familiarity with the tests in order to appreciate the “hurry up” quality Brigham was defending and also would need to read psychologists like Brigham in order to know how those empowered to interpret the tests viewed the testing situation.

Finally, of course, the historian seeking to recapture the young army recruits’ experience would want to take some of the test to get a taste of that aspect of their training. This exercise is risky if the historian leaps to believing that taking an old test eliminates the gulf that separates us from those who once lived in that other country we call “the past.” But just as risky for a historian is the failure to practice the imaginative skill of human empathy. Historians not only analyze historical data through the long lens of time but also try to imagine what the past felt like, looked like, smelled like; they are always balancing their analysis of how multiple factors shaped past events with their empathy for the human beings whose lives were altered by those factors and events.

As you work through the army tests in this assignment, try to place yourself in an army training camp in Nebraska in 1918. Imagine that you are an Italian immigrant whose family moved to Tampa, Florida, in 1905, when you were five years old. Now you’re away from home, living among strangers, learning how to march in formation, now to carry and shoot a rifle, how to pack and repack your duffel bag, how to stay out of your sergeant’s way. You’re trying to keep up your patriotic spirit about going out and killing some “Huns” while trying not to be scared. In the midst of all that, an officer shows up at your barracks and announces that it is your turn to take the “mental tests.” You’ve probably already met with a doctor and answered a few questions to prove that you are not crazy. Now you have to prove that you are not, in the parlance of the day, “feebleminded.” Maybe the officer who escorts you to the test indicates his view that the tests are stupid and should not be taken seriously; maybe the officer respects the tests and warns you that you had better do well on them. You hope to amount to anything in the army.

Once you get to the camp’s testing site – a spare storage room with poor lighting, poor acoustics, and no fresh air – you give a literacy test to determine if you should take the alpha tests for those literate in English or the beta tests for those not literate in English. Sometimes, when a high number of illiterates crowd into the camp’s beta test, the harried examiners arbitrarily lower the literacy score needed to qualify to take the alpha test.
As a boy, you attended an American school and learned how to read and write English, but most of your reading in the last eight years has been of Italian-language newspapers. Will your English be good enough to qualify for the alpha test? Do you want it to be?

Once inside the test room, the instructions you receive, in writing or orally, are given very quickly, and you cannot ask questions if you do not understand the instructions. For you and the other ninety men crammed into the too-small testing space with too few desks, the tests take less than an hour, and the examiner is constantly barking at you to hurry up. It is hard to hear everything the examiner says, but you don’t recall him saying that it is impossible to complete any one of the tests. And no one pauses to show the guy next to you how to hold the pencil that is needed for both the alpha and beta tests. Indeed, one examiner later recalls how “touching” it was “to see the intense effort…put into answering questions, often by men who never before had held a pencil in their hands.” Touching or not, try to imagine this sort of scenario as you take the following tests.

**TASK:**

Soldiers deemed illiterate in English were given eight different types of tests. These beta tests were administered to 14 percent of the native-born white recruits, 56 percent of the foreign-born whites, 33 percent of the Northern blacks, and 65 percent of the Southern blacks. You have already seen one type of beta test, the “digit and symbol” test. You will take three more tests, along with the exact instructions that the soldiers received before each test. Test administrators read these precise instructions from a standardized script. The alpha tests were given to “literate” soldiers. In total, the alpha tests were given to 86 percent of the native-born white recruits, 44 percent of the foreign-born recruits, 67 percent of the Northern blacks, and 35 percent of the Southern blacks. You will take three of the alpha tests along with the exact written instructions that accompanied them. The army examiners rotated different versions of each test so soldiers could not predict the exact questions they would receive on any given day.

After completing the tests, check your answers. Then fill out the following chart. According to Yerkes’ report, if you scored under 55 percent on the beta test or below 21 percent on the alpha test, you qualified as a “moron” but still could potentially be a good private in the army.

After completing the tests, and recording your scores, answer the following questions:

1. If you were writing about the experience of a young soldier in a training camp in 1918, how might your own experience taking the tests influence your story?

2. If you were either a historian of science or a social historian writing about the effect of cultural attitudes on the army’s intelligence tests, what four examples would you select from the six tests you just studied to illustrate your argument? What point would you want to make with those four examples?

3. In addition to using these tests to explore the ethnic and racial prejudices of the psychologists who designed and analyzed these tests, how might the test questions here also be used to illustrate a gap between the economic classes in American in 1918? In your judgment, which test questions best illuminate that gap?

4. In the decade preceding World War I, many African Americans in the southern United States migrated northward to cities such as Chicago, Cleveland, New York and Detroit. How could a historian use the army’s statistical profile of who took beta tests and who took alpha tests to explain the reasons blacks migrated north? How could a historian of science use those same statistics to show the fallacy in hereditarians’ claim that all African Americans, as a single category, are innately less intelligent than all white Americans?

5. Between 1900 and 1930, enrollment in American public high schools increased by 747 percent (from 519,251 to 4,399,422), even though state laws allowed students to leave school at age fourteen. How might environmental psychologists and educators in the 1920s have used the results of the army intelligence tests to argue for increased funding for public high schools and increased attention to night schools for adolescents in the workforce?

6. Our society continues to test individuals’ intellectual performance in order to place them in jobs, schools, and treatment programs. Psychologists today state that these current tests measure experience, not innate abilities, but critics argue that the tests are still culturally biased and, thus, poor measures of experience. What, for you, is the strongest argument in favor or using such tests for placement purposes? What is the strongest argument against using such tests?
## Measuring Mental Fitness: Government IQ Tests during World War I

### Source Analysis Table

Use this table to record your scores:

<table>
<thead>
<tr>
<th></th>
<th>Completed in allotted time?</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Maze</td>
<td></td>
<td>_____ of 3 correct</td>
</tr>
<tr>
<td>2. Cube Analysis</td>
<td></td>
<td>_____ of 8 correct</td>
</tr>
<tr>
<td>3. Picture Completion</td>
<td></td>
<td>_____ of 9 correct</td>
</tr>
<tr>
<td>4. Disarranged Sentences</td>
<td></td>
<td>_____ of 20 correct</td>
</tr>
<tr>
<td>5. Arithmetical</td>
<td></td>
<td>_____ of 10 correct</td>
</tr>
<tr>
<td>6. Information</td>
<td></td>
<td>_____ of 20 correct</td>
</tr>
</tbody>
</table>
**SOURCE 1: Beta Test #1: The Maze**

The soldiers were given two minutes to complete five mazes. Give yourself one minute, twenty seconds to complete three.

**Instructions:** “Now turn your papers over. This is test 1 here (pointing to page of record blank). Look.” After all have found the page, examiner continues, “Don’t make any marks till I say, ‘Go ahead.’ Now watch.” After touching both arrows, examiner traces through the first maze with pointer and then motions the demonstrator to go ahead. Demonstrator traces path through first maze with crayon, slowly and hesitatingly. Examiner then traces second maze and motions to demonstrator to go ahead. Demonstrator makes one mistake by going into a blind alley… Examiner shakes his head vigorously, says “No – no,” takes the demonstrator’s hand and traces back to the place where he may start again. Demonstrator traces rest of maze so as to indicate an attempt to make haste…. Examiner says “Good.” Then holding up blank, “Look here,” and draws an imaginary line across the page from left to right for every maze on the page. Then “All right. Go ahead. Do it (pointing to men and then to books). Hurry up.” The idea of working fast must be impressed on the men during the maze test. Examiner and orderlies walk around the room, motioning to men who are not working, and saying, “Do it, do it, hurry up, quick.” At the end of 2 minutes examiner says, “Stop! Turn over the page to test 2.”

---

SOURCE 2: Beta Test #2: Cube Analysis

The soldiers were given two and one-half minutes to calculate the number of cubes in sixteen drawings. Give yourself one minute, fifteen seconds to make the calculation for eight drawings. (Test answers are provided on the last page.)

Instructions: “This is the test 2 here. Look.” After everyone has found the page – “Now watch.” The order of procedure is as follows:

(1) Examiner points to the three-cube model on the blackboard, making a rotary movement of the pointer to embrace the entire picture.

(2) With similar motion, he points to the three-cube model on the shelf

(3) Examiner points next to picture on blackboard and asks, “How much?”

(4) Examiner turns to cube model and counts aloud, putting up his fingers while so doing, and encouraging the men to count with him

(5) Examiner taps each cube on the motions to demonstrator, asking him “How much?”

(6) Demonstrator (pointing) counts cubes on blackboard silently and writes the figure 3 in proper place.

Throughout the demonstration the counting is done deliberately, not more rapidly than one cube per second. At end of demonstration examiner points to page and says, “All right. Go ahead.” At the end of 2 1/2 minutes he says, “Stop! Look at me and don’t turn the page.”
The soldiers were given three minutes to “fix” twenty pictures. Give yourself ninety seconds to fix nine pictures. (Test answers are provided on the last page.)

Instructions: “This is test 6 here. Look. A lot of pictures.” After everyone has found the place, “Now watch.” Examiner points to hand and says to demonstrator, “Fix it.” Demonstrator does nothing, but looks puzzled. Examiner points to the picture of the hand, and then to the place where the finger is missing and says to demonstrator, “Fix it. Fix it.” Demonstrator then draws in finger. Examiner says, “That’s right.” Examiner then points to fish and place for eye and says, “Fix it.” After demonstrator has drawn missing eye, examiner points to each of the four remaining drawings and says, “Fix them all.” Demonstrator works samples out slowly and with apparent effort. When the samples are finished examiner says, “All right. Go ahead. Hurry up!” During the course of this test the orderlies walk around the room and locate individuals who are doing nothing, point to these pages and say, “Fix it. Fix them,” trying to set everyone working. At the end of 3 minutes examiner says, “Stop! But don’t turn over the page.”
The soldiers were given two minutes, ten seconds to compete this test. (Test answers are provided on the last page.)

**Instructions:** “The words MORNING THE RISES EVERY SUN in that order don’t make a sentence; but they would make a sentence if put in the right order: THE SUN RISES EVERY MORNING and the statement is true. Again, the words ANIMAL A IS THE RARE DOG would make a sentence if put in the right order: THE DOG IS A RARE ANIMAL but the statement is false. Below are twenty mixed-up sentences. Some of them are true and some are false. When I say go, take these sentences one at a time. Decide what each sentence would say if the words were straightened out, but don’t write them yourself. Then, if what it would say is true, draw a line under the word true; if what it would say is false, then draw a line under the word false. If you cannot be sure, guess. Begin with No. 1 and work right down the page until time is called.”

1. wood guns of made are……………………………………………………………………………… true false
2. people are many candy of fond………………………………………………………………… true false
3. war in are useful airplanes the…………………………………………………………………… true false
4. must die men all……………………………………………………………………………………… true false
5. property floods life and destroy…………………………………………………………………… true false
6. grow a climate oranges cold in…………………………………………………………………… true false
7. days there in are week eight a…………………………………………………………………… true false
8. months warmest are summer the………………………………………………………………… true false
9. are and apples long thin……………………………………………………………………………. true false
10. clothing valuable are for and wool cotton………………………………………………………. true false
11. health necessary camp a is to clean……………………………………………………………… true false
12. Germany of Wilson king is England and………………………………………………………. true false
13. work like all men…………………………………………………………………………………… true false
14. water cork on float will not………………………………………………………………………… true false
15. iron paper made of is filings………………………………………………………………………… true false
16. tropics is in the produced rubber………………………………………………………………….. true false
17. fish hunt and like boys to never…………………………………………………………………… true false
18. size now of guns use are great in…………………………………………………………………… true false
19. bushes trees roots have and their air the in………………………………………………………. true false
20. not bees lazy and are ants called………………………………………………………………… true false
Soldiers were given five minutes to solve twenty of these work problems. Give yourself two minutes and thirty seconds to solve ten of them. (Test answers are provided on the last page.)

Instructions: “Attention! Look at the directions at the top of the page while I read them. Get the answers to these examples as quickly as you can. Use the side of this page to figure on it you need to. I will say stop at the end of five minutes. You may not be able to finish all of them, but do as many as you can in the time allowed. – Ready – GO!”

1. If 24 men are divided into squads of 8, how many squads will there be? Answer:________________

2. A company advanced 5 miles from their trenches and retreated three miles. How far were they from their trenches then? Answer:________________

3. A regiment marched 40 miles in five days. The first day they marched 9 miles, the second day 6 miles, the third 10 miles, the fourth 8 miles. How many miles did they march the last day? Answer:________________

4. If it takes 6 men 3 days to dig a 60-foot trench, how many men are needed to dig it in half a day? Answer:________________

5. A rectangular bin holds 400 cubic feet of lime. If the bin is 10 feet long and 5 feet wide, how deep is it? Answer:________________

6. A recruit spent one-eighth of his spare change for post cards and four times as much for a box of letter paper, and then had 90 cents left. How much money did he have at first? Answer:________________

7. If a man runs a hundred yards in 10 seconds, how many feet does he run in a fifth of a second? Answer:________________

8. A U-boat makes 8 miles an hour under water and 15 miles on the surface. How long will it take to cross a 100-mile channel, if it has to go two-fifths of the way under water? Answer:________________

9. A ship has provisions to last her crew of 500 men 6 months. How long would it last 1200 men? Answer:________________

10. A certain division contains 3,000 artillery, 15,000 infantry and 1,000 cavalry. If each branch is expanded proportionately until there are in all 20,900 men, how many will be added to the artillery? Answer:________________
**SOURCE 6: Alpha Test #6: Information**

_Soldiers were given four minutes to complete forty of these sentences. Give yourself two minutes to complete twenty of them. (Test answers are provided on the last page.)_

**Instructions:** In each of the sentences below, you have four choices for the last word. Only one of them is correct. In each sentence draw a line under the one of the four words which makes the truest sentence. If you cannot be sure, guess.

1. Seven-up is played with **rackets** cards pins dice
2. Denver is in **Ohio** Georgia Colorado Michigan
3. The Leghorn is a kind of **horse** chicken fish cattle
4. The main factory of the Ford automobile is in **Bridgeport** Cleveland Detroit Youngstown
5. Silk comes from a kind of **crab** worm beetle plant
6. The Declaration of Independence was signed in **Detroit** Boston Philadelphia Concord
7. The artichoke is a **fish** lizard vegetable snake
8. The forward pass is used in **tennis** hand-ball chess football
9. Jess Willard is a **fortune-teller** labor-leader pugilist singer
10. Revolvers are made by **Smith & Wesson** Armour & Co Ingersoll Anheuser-Busch
11. The currant grows on a **tree** vine sheep bush
12. General Lee surrendered at Appomattox in **1812** 1886 1865 1832
13. A first-class batter now averages around **.300** .900 .600 .100
14. The Pittsburgh team is called **Giants** Cubs Pirates Tigers
15. The Union Commander at Mobile Bay was **Dewey** Sampson Schley Farragut
16. Among the allies of Germany is **Norway** Rumania Bulgaria Portugal
17. To set fire to a house is called **larceny** incest mayhem arson
18. The spark-plug of a gas engine belongs in the **crank case** manifold cylinder carburetor
19. The author of the “Scarlet Letter” is **Poe** Hawthorne Cooper Holmes
20. John Sargent is a well-known **author** scientist politician painter
ANSWERS:

Source 2:
Top row: 27, 15, 15, 18;  
Bottom row: 19, 40, 10, 22 

Source 3:
5/chimney; 
6/ear;  
7/filament;  
8/stamp in right corner;  
12/fail;  
13/leg;  
14/shadow;  
15/Man’s ball in right hand;  
16/net 

Source 4:  
1: guns are made of wood/true;  
2: many people are fond of candy/true  
3: airplanes are useful in the war/true  
4: all men must die/true  
5: floods destroy life and property/true  
6: oranges grow in a cold climate/false  
7: there are eight days in a week/false  
8: the summer months are warmest/true  
9: apples are long and thin/false  
10: wool and cotton are valuable for clothing/true  
11: a clean camp is necessary to health/true  
12: Wilson is king of England and Germany/false  
13: all men like work/false  
14: cork will not float on water/false  
15: paper is made of iron filings/false  
16: rubber is produced in the tropics/true  
17: boys never like to fish and hunt/false  
18: guns now in use are of great size/true  
19: trees and bushes have their roots in the air/false  
20: ants and bees are not called lazy/true 

Source 5:  
1: 3;  
2: 2;  
3: 7;  
4: 36;  
5: 8;  
6: $2.40;  
7: 6;  
8: 9;  
9: 2.5;  
10: 300. 

Source 6:  
1/cards;  
2/Colorado;  
3/chicken;  
4/Detroit;  
5/worm;  
6/Philadelphia;  
7/vegetable;  
8/football;  
9/pugilist;  
10/Smith & Wesson;  
11/bush;  
12/1865;  
13/.300;  
14/Pirates;  
15/Farragut;  
16/Bulgaria;  
17/arson;  
18/cylinder;  
19/Hawthorne;  
20/painter