

and dehydration carried to completion in the vacuum.

A second patent No. 2,339,757, has also been obtained by Mr. Baer on application of dry radiant heat to sliced potatoes in the vacuum dehydrating chamber. This brings them out as clear, translucent flakes, without the chalky appearance that often mars dehydrated potato slices.

Both of the patents are assigned to the Guardite Corporation.

Science News Letter, February 5, 1944

AERONAUTICS

Sound Travels Slower As Temperature Drops

► THE TEXTBOOKS are right when they state that the speed of sound in air decreases as the temperature decreases.

Readers are asked to correct the "Fundamentals of Rockets" story, SCIENCE NEWS LETTER, Jan. 15, 1944, page 34, column 3, paragraphs 7 and 8, so that they read:

"The velocity of sound is not much affected by the thinness of the air at high altitudes. It, however, is affected by the temperature and is *lower* at the low temperatures there prevailing.

"A drop in temperature of 100 degrees Fahrenheit would *decrease* the speed of sound by about 75 miles per hour."

Our thanks to the numerous readers who picked up and reported this troublesome error.

Science News Letter, February 5, 1944

ENGINEERING

Two-Boat Transportation For Bulldozers Patented

► TRANSPORTATION of a military type is offered by a new arrangement of boats on which Andrew J. Higgins, well-known New Orleans builder, has taken out patent No. 2,339,014. He uses two stoutly built pontoon units, connected by a platform underslung on a U-shaped framework between them, for the carriage of bulldozers, tanks, heavy artillery pieces and similar cargoes for battle.

The forward part of the platform can be raised slightly, serving as a kind of auxiliary bow to slap down waves that get in the way. When the bows touch bottom at the beach, this hinged portion is lowered to provide a landing ramp.

Science News Letter, February 5, 1944

PSYCHOLOGY

Test Your Science Talent

Questions in the examination used in the Third Annual Science Talent Search are designed to show how well you can reason and understand.

► IF YOU have wondered whether you have ability in science, here is a test that will give you some hint as to whether you can aspire to scientific achievement.

The questions reproduced on the following pages are part of the science aptitude test of the Third Annual Science Talent Search that has just been judged.

Try them on yourself or some friend. Here is how to do it. It is a test of how well you can read and understand the materials of science. There are two kinds of questions. In the case of questions 1 to 15, answer each by putting an X in the answer box corresponding to the number of the answer which is most nearly correct. In the case of questions numbered 56 to 60 and 91 to 97, first read each paragraph and then answer each of the questions in the same way. You should be able to do the test in less than an hour. Do all the questions in one sitting and do not look at the answers, printed elsewhere in this issue, until you have finished.

To discover scientific ability among the boys and girls just finishing high school, the Third Annual Science Talent Search for the Westinghouse Science Scholarships is being conducted this year. The first step of this nation-wide search for those likely to become the scientists of tomorrow has been completed. Nearly 15,000 copies of the science aptitude examination and other inquiry blanks were distributed to teachers in thousands of high schools throughout the nation.

The test, reproduced in part on the following pages, is only one of the techniques used in the selection of boys and girls who are scientifically gifted. In addition, each contestant filled out a personal data blank and wrote an essay describing some scientific project he has done or wishes to do. Teachers filled out a recommendation form and principals reported scholarship.

Forty contestants will receive free trips to the Science Talent Institute to be held in Washington, D. C., early in March. Of these, two will be selected to receive

\$2,400 Westinghouse Grand Science Scholarships to the college of their choice, eight will get \$400 Westinghouse Science Scholarships, and additional Westinghouse scholarships which total \$3,000 will be awarded at the discretion of the board of judges. Honorable mentions also will be awarded to call the attention of colleges and universities to those contestants of outstanding ability. This will uncover scientific ability among those ready to enter college. Thus, exceptional youths, in the shortest possible time, will take up leadership in scientific research so important to the war effort and be ready to take a hand in the scientific world of the peace to come.

Science Service, sponsoring Science Clubs of America, is conducting the Science Talent Search as a part of the science club movement.

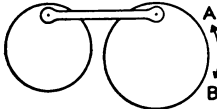
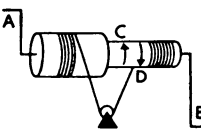








The aptitude examination does not test primarily what a person already knows about science. It is designed to tell how well you can reason and understand. Thus, even those who have no special training in science will want to try it.

The test was devised for the Science Talent Search by Dr. Harold A. Edgerton, director of the Occupational Opportunities Service of Ohio State University and Dr. Stuart Henderson Britt, of Washington, D. C. The most advanced testing methods developed over the past two decades, were utilized in constructing the test.

All the 80 boys and girls selected in the first two years of the Science Talent Search are now either in college or in the armed services. All but three of those in the Army or Navy have been sent to college for specialized scientific training.

Only time will tell whether those selected by this method will contribute to scientific research as expected. It is planned to follow for at least 10 years the careers of the winners and also of all those who completed entries.

Of the thousands of boys and girls who have taken the examination in the three searches conducted so far, not one

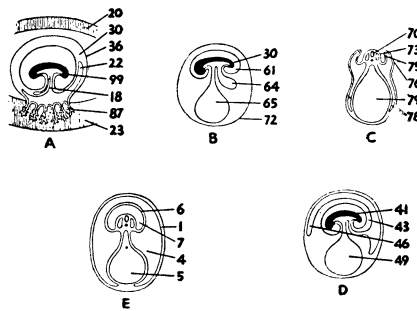
1. The sixth term of the series 2, 1, $\frac{1}{2}$, $\frac{1}{4}$, is 1: 0.125 2: 0.0625 3: 0.03125 4: 0.015625 1
2. The word geotropic is a technical word belonging to the field of 1: biology 2: physics
3: physical chemistry 4: geology 2
3. Gutta-percha is a substance obtained from 1: trees 2: whales 3: soybeans 4: petroleum 3
4. When the smaller wheel rotates in a clockwise direction, the larger wheel will 1: rotate in direction A 2: rotate in direction B 3: move back and forth 4: prevent the rotation of the smaller wheel 4
- 
5. The adjective gnostic means pertaining to or characterized by 1: aphorism
2: insight 3: disbelief 4: knowledge 5
6. Ankylosis of the elbow joint means that the joint is 1: swollen 2: infected 3: sprained
4: stiff 6
7. In the differential windlass, with which crank and turned in which direction can a weight be raised most efficiently? 1: A, C 2: A, D
3: B, C 4: B, D 7
- 
8. The word integument refers to 1: unity or singleness 2: organized 3: internal 4: skin 8
9. Igneous is a term which primarily belongs to the field of 1: geology 2: theology 3: agronomy
4: physical anthropology 9
10. Given the relationship, $E = Vdgh$: where E = lost energy, V = velocity, d = density of drop, g = force of gravity, and h = height, the amount of energy lost by drops of two liquids dropped into a glass container under the same conditions varies with 1: velocity 2: density 3: gravity
4: height 10
11. The word redolent is most likely to occur in 1: astronomy 2: chemistry 3: geology
4: physics 11
12. Four pieces of aluminum have been cast. The height and diameter of the cylinder, No. 1, are each one foot. No. 2 is a twelve-inch cube. No. 3 is a sphere with a six-inch radius. No. 4 is a pyramid with a base one foot square and an altitude of one foot. Which of the pieces weighs the least? 1.  2.  3.  4.  12
13. Vitreous means 1: calcified 2: glassy 3: white clay 4: fused 13
14. A tank is to be built so that its surface contains 30 square feet of steel, one-eighth inch thick when finished. The shape of tank having maximum capacity for the given amount of material is 1: a cube
2: a sphere 3: an oblate spheroid 4: a cylinder 14
15. Which of the following shapes is cuneiform? 1.  2.  3.  4.  15

PARAGRAPH B: The pitch of sound, which is proportional to the frequency of vibration of the source, differs from the frequency of the source whenever the distance between the observer and the source is changing. This difference is marked whenever the velocity of motion is large with respect to the speed of sound — 1100 feet per second in air: the upper limit of audibility is about 18,000 vibrations per second. It can be shown that heard pitch is equal to the product of the frequency of vibration of the source and a quotient: the velocity of sound propagation and the velocity of the observer divided by the velocity of sound propagation and velocity of the source. When observer and source approach each other the velocities are added in the dividend and subtracted in the divisor. The inverse condition obtains when motion is reversed. (Let V = velocity of wave propagation, F = the frequency of the source of sound, S = the velocity of the source, O = the velocity of observer, and P = the observed pitch.)

QUESTIONS ON PARAGRAPH B:

56. A formula giving the velocity of a source of vibration receding from a stationary observer is $1: S = \frac{F(V)}{V + P}$
 2: $S = \frac{(F - P)V}{P}$ 3: $S = \frac{F(V)}{P}$ 4: $S = \frac{F}{P}$ 1 2 3 4 56
57. If a whistling train moves from an observer on another moving train, the observed pitch may be determined by the formula $1: P = FV$ 2: $P = \frac{F(V - O)}{V + S}$ 3: $P = \frac{VF}{V + S}$ 4: $P = \frac{V + S}{VO}$ 1 2 3 4 57
58. The "whistles" on the fins of a bomb emit a frequency of F vibrations per second. The frequency analyzed on the ground is P vib/sec. How fast is the bomb approaching if V = Velocity of sound?
 $1: \frac{VF + VP}{V}$ 2: $\frac{FP}{V}$ 3: $\frac{VP - VF}{P}$ 4: $\frac{VP}{F}$ 1 2 3 4 58
59. In August of 1943, Colonel Hough was reported to have dived a plane at 780 mph. If a siren were attached to the tail of his plane and vibrated at 790 vib/sec. during the dive only, $1:$ the siren could not be heard on the ground on a straight line projected from his direction of dive $2:$ the apparent pitch of the siren dropped $3:$ Hough could hear the siren intermittently $4:$ the pitch of the sound heard was 10 vib/sec 1 2 3 4 59
60. The whistle of a train A was set to deliver a sound of 650 vib/sec. An observer on train B moving at 30 miles per hour heard the whistle sound 20 seconds after he saw the steam of the whistle. The pitch of the sound observed was determined to be 650 vib/sec. The distance between the observer and whistle after the whistle had been blown for 20 seconds is $1:$ 4.1 mi. $2:$ 5.6 mi. $3:$ 3.2 mi. $4:$ 7.5 mi. 1 2 3 4 60

PARAGRAPH G: There are four embryonic membranes in vertebrates — the yoke sac, the allantois, the amnion, and the chorion. The amnion and chorion are formed by a fold of the somatopleuræ which rises up around the embryo and fuses over it; the outer limb of the fold becomes the chorion and the inner the amnion. The yoke sac which extends ventral to the embryo becomes smaller with development, the allantois spreading between the amnion and yoke sac, and the chorion. The allantois originates as an evagination of the embryonic digestive tract, the outer wall of the allantois growing into contact with the chorion; the two together form the chorio-allantoic membrane. In mammals the placenta is formed by the penetration of the chorio-allantoic membrane into the wall of the uterus, the penetration taking the form of treelike ingrowths which are called chorionic villi.



QUESTIONS ON PARAGRAPH G:

91. If the embryonic diagrams above were to be arranged in sequence from oldest to youngest, which would be the second? $1: A$ $2: B$ $3: C$ $4: D$ 1 2 3 4 91
92. In which diagram does the allantois first appear? $1: B$ $2: C$ $3: D$ $4: E$ 1 2 3 4 92
93. Which embryonic membrane is in closest contact with the skin of the embryo? $1:$ allantois $2:$ amnion $3:$ yoke sac $4:$ chorion 1 2 3 4 93
94. Structure 79 in C is identified by what number in diagram A? $1: 30$ $2: 22$ $3: 18$ $4:$ none 1 2 3 4 94
95. Structure 75 in C is identified by what number in diagram E? $1: 7$ $2: 1$ $3: 4$ $4: 6$ 1 2 3 4 95
96. What structure in C is the same as structure 99 in diagram A? $1: 78$ $2: 76$ $3: 79$ $4: 70$ 1 2 3 4 96
97. What structure in D is the same as structure 4 in diagram E? $1: 41$ $2: 43$ $3: 46$ $4: 49$ 1 2 3 4 97

made a perfect score. When you try this selection of questions from the examination you should, therefore, not expect to find that you have checked all the right answers.

To save your time only typical questions out of the original three-hour examination are reproduced on the following pages.

Don't read further. Cover up this paragraph until you have taken the test. Here are the correct answers:

1. 2; 2. 1; 3. 1; 4. 3; 5. 4; 6. 4; 7. 3; 8. 4; 9. 1; 10. 2; 11. 2; 12. 2; 13. 2; 14. 2; 15. 2; 16. 2; 17. 2; 18. 2; 19. 1; 20. 1; 21. 1; 22. 2; 23. 2; 24. 2; 25. 2; 26. 2; 27. 2; 28. 2; 29. 2; 30. 2; 31. 2; 32. 2; 33. 2; 34. 2; 35. 2; 36. 2; 37. 2; 38. 2; 39. 2; 40. 2; 41. 2; 42. 2; 43. 2; 44. 2; 45. 2; 46. 2; 47. 2; 48. 2; 49. 2; 50. 2; 51. 2; 52. 2; 53. 2; 54. 2; 55. 2; 56. 2; 57. 2; 58. 2; 59. 2; 60. 2; 61. 2; 62. 2; 63. 2; 64. 2; 65. 2; 66. 2; 67. 2; 68. 2; 69. 2; 70. 2; 71. 2; 72. 2; 73. 2; 74. 2; 75. 2; 76. 2; 77. 2; 78. 2; 79. 2; 80. 2; 81. 2; 82. 2; 83. 2; 84. 2; 85. 2; 86. 2; 87. 2; 88. 2; 89. 2; 90. 2; 91. 2; 92. 2; 93. 2; 94. 2; 95. 2; 96. 2; 97. 2; 98. 2; 99. 2; 100. 2; 101. 2; 102. 2; 103. 2; 104. 2; 105. 2; 106. 2; 107. 2; 108. 2; 109. 2; 110. 2; 111. 2; 112. 2; 113. 2; 114. 2; 115. 2; 116. 2; 117. 2; 118. 2; 119. 2; 120. 2; 121. 2; 122. 2; 123. 2; 124. 2; 125. 2; 126. 2; 127. 2; 128. 2; 129. 2; 130. 2; 131. 2; 132. 2; 133. 2; 134. 2; 135. 2; 136. 2; 137. 2; 138. 2; 139. 2; 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If more than ten were scored right you did better than three-fourths of the scholars.

Science News Letter, February 5, 1944

ENGINEERING

X-Ray Tube Locates Foreign Bodies in Tires

► HIDDEN nail-in-the-tire troubles are exorcised by the invention on which G. P. Bosomworth of Akron, Ohio, received patent No. 2,339,550, rights in which are assigned to Firestone Tire and Rubber Company. The device consists of a powerful X-ray tube attached to a lead-shielded frame, over which automobile wheels may be slowly rotated without being removed from the car. The operator, peering through an aperture at a fluorescent screen, sees nails, sharp metal scraps and other tire-hurting foreign bodies in dark silhouette. He marks the spot with chalk for the guidance of the repair man.

Science News Letter, February 5, 1944

HORTICULTURE

Hand-Pushed Weeder Invented for Gardens

► A NEW TYPE of hand-pushed, wheeled, weeding implement, is covered by patent No. 2,339,905, obtained by W. J. Baker of Southgate, Ky. It resembles in principle the larger, power-drawn implements known as subsoil or fallow cultivators now coming into favor in soil-conserving agricultural practice. Long, flat, relatively narrow blades are drawn through the soil just below the surface, neatly shearing off the roots and leaving the tops to wilt and die and form a mulch.

Science News Letter, February 5, 1944