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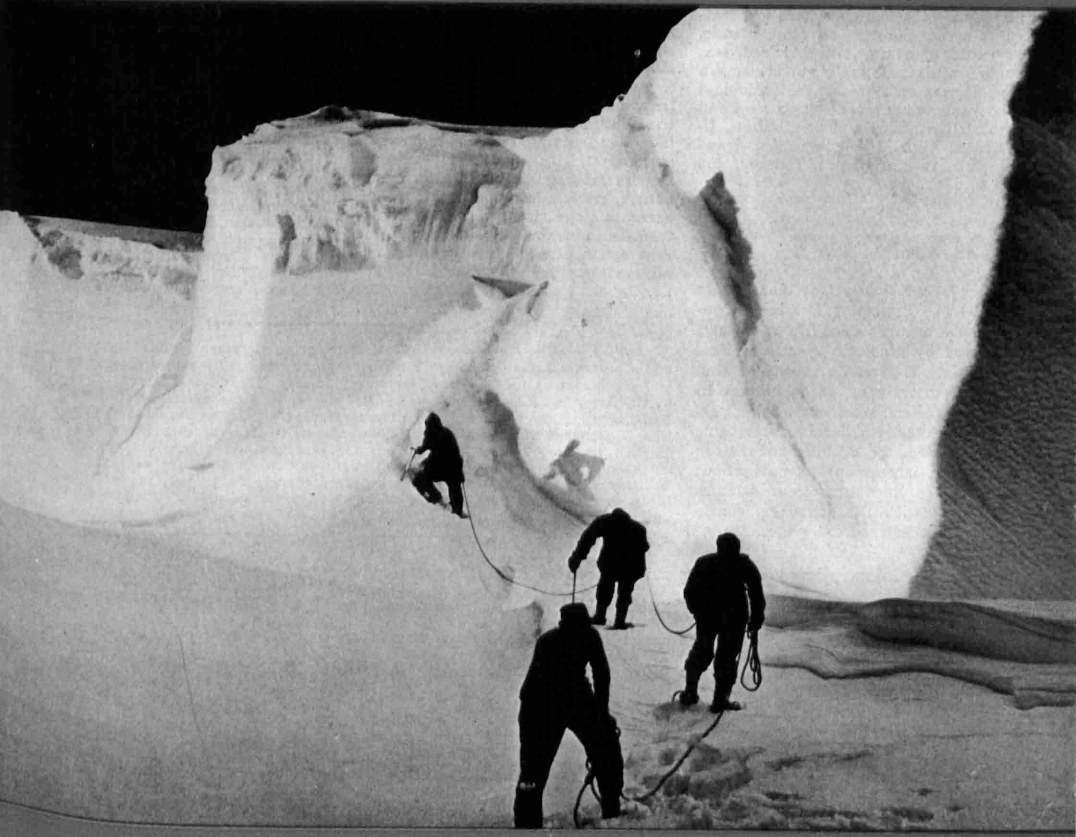
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • FEBRUARY 3, 1945



Rescue Party

See Page 75

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MEDICINE

Muscle Disease Remedy

May come from a new chemical made from vitamin E in combination with one of the B vitamins; effectiveness of treatment is not known yet.

➤ A REMEDY for muscular dystrophy may come from a new chemical to be made from two vitamins, it appears from research reported by Dr. Ade T. Milhorat and Dr. W. E. Bartels, of Cornell Medical College and New York Hospital (*Science*, Jan. 26).

The vitamins are tocopherol, also known as vitamin E and as the fertility vitamin, and inositol, one of the B vitamins. Neither of them alone is expected to be helpful. Large doses of both given together may help patients with a mild form of the disease. For those in whom the disease is more rapidly progressive, the new condensation product of the two vitamins will be needed, the doctors believe.

Whether this product actually will help patients cannot be stated at present because the doctors have not had enough of it for trial. They hope to get and try it soon.

Laboratory tests and studies of animals are the basis for the hope that the condensation product of tocopherol and inositol will be an effective remedy for progressive muscular dystrophy. This disabling disease is characterized by marked weakness associated with degenerative changes in the affected muscles. There is also an abnormal excretion of the chemical, creatine.

Creatine is present in muscles as part of the compound, prosphocreatine. When muscles contract, this compound breaks down into creatine and phosphoric acid. In the recovery of the muscle the two substances are recombined into phosphocreatine.

The Cornell scientists had just enough of the new chemical to try the effect of single doses in a few patients. The abnormal excretion of creatine was reduced for a few days, which encourages them to believe that continued treatment will prove helpful.

Muscular dystrophy very similar to that in patients can be induced in laboratary animals by withholding tocopherol from their diet. Doses of tocopherol by mouth promptly reduce the abnormal creatine excretion and restore muscular function in the animals.

Tocopherol alone has no effect in human patients. The reason, apparently, is that progressive muscular dystrophy results from an inherited defect in the body's handling of tocopherol and inositol in food. Normally the condensation product of these two substances can be made in the body but patients with muscular dystrophy lack the ability to make the product.

Patients with a mild form of the disease apparently can make enough of the product if given large amounts of the two vitamin chemicals. Those with a more severe form of the disease cannot. For them the new chemical, if it comes up to expectations, will be what insulin is to diabetics.

Science News Letter, February 3, 1945

GEOGRAPHY

Inter-American Highway For Florida, Cuba, Mexico

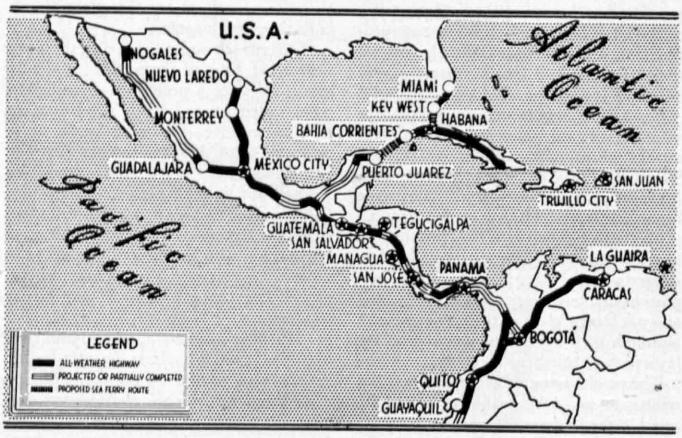
➤ CUBA INTENDS to carry out her part of a proposed Overseas Inter-American Highway which would link Florida, Cuba and Mexico by sea ferry and road with the land Inter-American Highway route which extends from Laredo, Texas, on the U. S.-Mexican border, to the Panama Canal.

In a message to the Cuban Congress, President Ramon Grau San Martin promised that Cuba would cooperate in the projected sea ferry-highway route which would save 1500 miles of travel between eastern United States seaboard and Mexico.

The plan has also been endorsed by the Mexican Government's Tourist Commission and by the Florida State Chamber of Commerce and the Miami Chamber of Commerce. In 1941, the plan was presented to the Pan American Highway Congress by the Pan American Highway Confederation.

The projected route would make automobile travel possible from the mainland of Florida over the completed overseas highway to Key West, thence by sea ferry to Havana, Cuba, involving a 6½-hour ferry trip covering 90 miles. From Havana, travelers would drive down to Guane at the tip of southwestern Cuba, a distance of 156 miles, over a highway already built. Here the traveler and his vehicle would again board a ship ferry to be transported to Puerto Juarez on the eastern shore of the tip of the Yucatan Peninsula in Mexico, a voyage of some 170 miles by water from Guane, Cuba.

Having debarked at Puerto Juarez, the driver would travel westward over an all-weather highway now under construction to Chichen Itza, site of the famous ruins of the Mayans. (*Turn Page*)



SEA-FERRY-ROAD LINK—Florida, Cuba and Mexico will be linked by the still uncompleted Overseas Inter-American Highway. The map shows both the proposed construction and the already completed parts of the route.

From Chichen Itza, travelers would drive via Hopelchen over a projected 342-mile Peninsular Highway to San Cristobal de las Casas, State of Chiapas, where connection would be made with the land Inter-American Highway. At present only preliminary work has been done on the construction of the Peninsular Highway, and Yucatan Peninsula is still without highway or even rail connection with the rest of Mexico.

On reaching San Cristobal de las Casas, travelers will be able to drive back to the United States without retracing their route. When present construction is completed they will be able to drive on the Inter-American Highway through the interior of Mexico.

Already an asphalt-surfaced road exists on the Inter-American Highway route south of the United States-Mexican border to Mitla, a few miles below Oaxaca City. A gravel-surfaced road is now being completed between Mitla, scene of pre-Spanish ruins, and Tapanatepec, though a bridge is still lacking over the wide Tehuantepec River. Between Tapanatepec and Las Cruces there is a trail traversable by horse and on foot only, and farther south to San Cristobal there are stretches that are passable in dry weather.

Travelers will not be able to drive through Central America until the 169-mile section between Comitan and Tapachula, 12 miles from the Guatemalan border, is made traversable. From Tapachula, however, one may today drive all the way through Guatemala, El Salvador, Honduras and Nicaragua, as far as the Costa Rican border, over the Inter-American Highway or alternate route.

The surface on this Inter-American Highway or its alternate route is, as a rule, an all-weather surface. Considerable construction still needs to be done in northern and southern Costa Rica and in northern Panama before the Inter-American Highway will be traversable all the way south of the United States to the Panama Canal.

Science News Letter, February 3, 1945

MEDICINE

Strep Throats Prevented

Sulfadiazine prophylaxis prevented an epidemic threatening an Army Air Forces technical school; also checked scarlet fever.

➤ EPIDEMICS of streptococcus sore throats and scarlet fever that threatened an Army Air Force technical school were prevented and cases of these ailments reduced almost to zero by sulfadiazine prophylaxis, Capt. Richard G. Hodges of the Army Medical Corps reports, (*New England Journal of Medicine,* Dec. 21).

Cases of pneumococcal pneumonia were also significantly reduced, as were attacks of ordinary respiratory disease which the layman would call a cold. Rhinitis, pharyngitis, laryngitis and acute bronchitis were included in this group.

The effect of sulfadiazine prophylaxis in reducing these ailments, Capt. Hodges suggests, is probably because a fair proportion of them were caused by bacteria and not by the virus of the common cold, although their symptoms would lead the layman to label them as colds.

The results reported were achieved last winter at an AAF technical school located in the midwestern part of the country. A severe epidemic of respiratory diseases including strep sore throats and pneumococcal pneumonia had struck this school during the winter of 1942-1943 and did not die down until May. When in January, 1944, these epidemics threatened a repeat performance, the decision was made to try the effect of sulfadiazine prophylaxis.

Different schedules for giving the drug were tried. One of these called for daily small doses for a prolonged period. Another called for twice this sized dose on two consecutive days each week. It is believed, Capt. Hodges reports, that the best dosage for a given group should be worked out individually.

No serious reaction to the drug occurred. Patients with pneumococcal pneumonia who had been given sulfadiazine prophylactically seemed to respond as well as ever to the drug when given as treatment.

"The most convincing information yet published" on the effects of sulfadiazine prophylaxis, comments the editor of the *New England Journal of Medicine,* appears in that part of Capt. Hodges' report showing a continued rise in streptococcal infections in the group of men not getting the drug at the same time that these infections dropped sharply in the group on prophylaxis.

Possible dangers of mass prophylaxis with sulfadiazine are stressed by the editor. One is the possibility that men may become sensitized to the drug so that they will not be able to take it as a remedy if they should require it for some illness. Another is the development of resistance to the drug by the streptococci. One group of scientists has already reported that they could not control by sulfa drug prophylaxis the spread of a drug-resistant streptococcus in a measles ward.

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Possible effects of sulfa drug prophylaxis on the heart must be considered, the editor points out, since deaths as the result of heart muscle changes following treatment with sulfa drugs are apparently increasing. It is also possible that getting protection against disease germs at one time may result in continuing susceptibility to the germs and the "development of appreciable patterns of illness on later exposure to infection.

"Military necessity will, of course, dictate the continuation of sulfonamide prophylaxis," the editorial comment continues. "Even in such populations the alleviation of an immediate problem may ultimately prove to affect adversely the future health of service personnel.

"So far as civilian populations are concerned, there seems little justification for the wholesale and uncontrolled use of long-continued sulfonamides, save on a purely experimental basis, with a carefully thought-out and controlled study.

"Furthermore, attention should be directed to other measures for the control of streptococcal infections that are not accompanied by the dangers and difficulties mentioned above. Dust control (by the oiling of floors and bedclothes), sterilization of the air by ultraviolet irradiation and the use of aerosols, ventilation, improved methods of housing and so forth may be mentioned as procedures of probable benefit."

Science News Letter, February 3, 1945

GENERAL SCIENCE—EDUCATION

Science Talent Winners

Eleven girls, 29 boys are invited to Washington to attend the Science Talent Institute. Will receive scholarships totaling $11,000.

ELEVEN GIRLS and 29 boys have been invited to Washington, March 2 through March 6, to compete for the Westinghouse Science Scholarships in the Fourth Annual Science Talent Search conducted by Science Clubs of America, administered by Science Service. They will spend five days together at the Science Talent Institute in Washington.

The names of the trip winners were announced by the judges as the result of a strenuous competition in which superior seniors of all secondary schools in the United States were invited to participate. The 40 winners were selected from about 15,000 entrants. About 3,000 of these students completed a science aptitude examination, submitted recommendations and scholarship records and wrote an essay on "My Scientific Project."

The trip winners come from 34 localities in 15 states. Entries were received from every state in the union.

Those who come to Washington for the Science Talent Institute in March on the all-expense trips, will compete for scholarships which will allow them to go to any college, university or technical school of their own selection to continue science or engineering training. One boy and one girl will be awarded $2,400 Westinghouse Grand Science Scholarships ($600 a year for four years), while 8 winners will be awarded $400 Westinghouse Science Scholarships ($100 a year for four years), and $3,000 more in Westinghouse Science Scholarships will be awarded at the discretion of the judges.

Selected without regard to geographic consideration, the results show that this year winners come from some states that have not had winners before. Nebraska, Rhode Island and Tennessee have winners this year for the first time.

Only two schools in the United States have produced more than one winner this year. They are: Evanston Township High School, Evanston, Ill., and Stuyvesant High School, New York, N. Y. The former will send two girls to the Science Talent Institute; the latter two boys.

Three schools have had a winner in one other year and have been able to place winners again this year. They are Lyons Township High School, LaGrange, Ill., New Rochelle High School, New Rochelle, N. Y., and Roslyn High School, Roslyn Heights, N. Y.

Only four schools have placed winners in three out of the four annual searches. The schools winning this distinction are: Phillips Exeter Academy Exeter, N. H.; Brooklyn Technical High School, Brooklyn, N. Y.; West Senior High School, Madison, Wis., and Shorewood High School, Milwaukee, Wis.

Evanston, Ill., Brooklyn, N. Y., New Rochelle, N. Y., and New York, N. Y., will send two or more winners each but except in two cases they are not from the same high school within the city.

Most of the winners live at home and attend their local or nearby public or parochial high schools. Two, however, are enrolled in private schools and go to school in another state. Their homes are in New York, N. Y. and Scottsville, Va.

About three-fifths, 58%, or 23 out of the 40 Science Talent Search trip winners, ranked first or second in their graduating classes.

Most of the winners are members of science clubs and at least sixteen of them are presidents or hold other offices in their clubs. Many of them belong to science clubs of various kinds, so that the total number of clubs in which they work is 61.

Many of the winners have chosen their fields of science study. Their choices range from anthropology to electronic engineering. Five would prefer to get into biological fields such as medicine, histology and parasitology. The boys lean heavily toward engineering, especially in electronics, electrical and electro-chemical engineering. A number want to get into mathematical physics, especially atomic physics. Fourteen are choosing to go into the field of chemistry as metallurgists, organic researchers and as chemical engineers. All hope to be able to have a career in research.

The judges of the Science Talent Search are: Dr. Harlow Shapley, director of the Harvard College Observatory and Vice President of Science Service; Dr. Harold A. Edgerton, director, Occupational Opportunities Service, Ohio State University; and Dr. Steuart Henderson Britt, Washington psychologist. The latter two are the designers of the Science Aptitude Examination made each year expressly for the Science Talent Search.

In addition to the 40 winners of trips to Washington for the final competition for the Westinghouse Science Scholarships, 260 boys and girls will be named for honorable mention in the Fourth Annual Science Talent Search. They will be recommended to colleges and universities for their science aptitude and, if they are as fortunate as those previously named for this honor, they will receive offers of scholarships from many schools and colleges seeking talented students.

Previous winners of the Science Talent Search now total 120. They are now students in colleges and universities where they are preparing themselves for

scientific careers. The exceptions are those who have been called into war service. At present 44 are serving in the armed forces—two of them on war fronts in battle action.

The Annual Science Talent Search is conducted by Science Service, 1719 N St., N. W., Washington 6, D. C., as one of the activities of Science Clubs of America. Awards are provided and the Science Talent Search made financially possible by the Westinghouse Electric & Manufacturing Company, a leader in scientific research, engineering and manufacture in the electrical industry, as a contribution to the advancement of science in America.

Science News Letter, February 3, 1945

METEOROLOGY

Ideal Hunting Calls for Light Rain or Snow

➤ HUNTERS seeking deer should count themselves fortunate in case of light rain or snow, for ideal hunting is afforded by a damp forest floor that allows the hunter to stalk his game quietly, states Charles B. Fobes of Portland, Me., (*Journal, Wildlife Management*, January).

Precipitation in the form of either rain or snow controls the amount of ground moisture and largely determines the number of deer killed in any one season. Fewer white-tailed deer are killed in Maine during hunting seasons without snow and when temperatures and precipitation are below normal, Mr. Fobes found.

The number of deer killed legally during a hunting season depends upon the deer population, number of hunters within the area, length of season, and hunting conditions. Mr. Fobes, however, believes that hunting conditions as regulated by the weather elements are the most important single factor.

An increase in the precipitation and number of "rainy" days brings about a similar increase in the deer kill, he found by studying the areas where deer were killed from Nov. 1 to Dec. 1 in the years 1939 to 1942 and correlating this with local weather information.

Frequent rain or snow keeps the forest floor moist and affords quiet hunting conditions. Heavy downpours, on the other hand, usually drive the white-tailed deer to cover, but with clearing weather the deer move about much more. Even a slight snowfall enables hunters to track deer readily. But there is little chance of success on clear days where drying conditions lead to noisy hunting.

Science News Letter, February 3, 1945

GENERAL SCIENCE

40 Winners Listed

The 11 girls and 29 boys (proportion determined by ratio of boys to girls entering the contest) are being invited on all-expense trips to Washington, D. C., March 2 to 6, 1945, to attend the Science Talent Institute, where one boy and one girl will be awarded $2,400 Westinghouse Grand Science Scholarships, eight winners will be awarded $400 Westinghouse Science Scholarships, and $3,000 additional in scholarships will be awarded.

ARIZONA

Phoenix — Royden, Halsey Lawrence, Jr. 16 Phoenix Union High School

CALIFORNIA

Belmont — Hodgson, Margaret Joan 17 Notre Dame High School

ILLINOIS

Evanston — Kaufmann, Renate Mathilde 16 Evanston Township High School
Parker, Edythe Wilma 16 Evanston Township High School
Harvey — Clark, George Whipple 16 Thornton Township High School
LaGrange — Anson, John Hahn 17 Lyons Township High School
Troy — Reed, Charles Orlando 17 McCray-Dewey Township High School
Washington — Rich, Ronald Lee 17 Washington Community High School

MICHIGAN

Detroit — Walker, Edward John 17 Cooley High School

MISSOURI

University City — Michel, Maynard Cornelius 17 University City Senior High School

NEBRASKA

Minden — Petersen, Frederic E'John 17 Minden High School
Valley — Wahlgren, John Howard 17 Valley High School

NEW HAMPSHIRE

Exeter — Dwight, Kirby, Jr. 16 Phillips Exeter Academy
Wilton — Moore, John Fitzallen 16 High Mowing School

NEW JERSEY

Newark — Milburn, Richard Henry 16 Barringer High School

NEW YORK

Albany — Boochever, Lois Lee 16 St. Agnes School
Brooklyn — Conroy, Harold 16 Brooklyn Technical High School
Kravetz, Saul 17 Abraham Lincoln High School
Joswick, Marion Cecile 17 Manual Training High School
Far Rockaway — Blackman, Jerome 16 Far Rockaway High School
Forest Hills — Sessler, Andrew M. 15 Forest Hills High School
New Rochelle — Kegelman, Matthew Roland 16 Iona Preparatory School
Reichart, Ruth 16 New Rochelle High School
New York — Kosower, Edward Malcolm 15 Stuyvesant High School
Streitwieser, Andrew 17 Stuyvesant High School
Levy, Madeline Lenore 16 William Howard Taft High School
Roslyn Heights — Gurney, Jean Carolyn 16 Roslyn High School
Syracuse — Hill, David Allen 17 Syracuse Central High School
Watertown — Stafford, Nancy Jeannette 17 Watertown High School

OHIO

Cleveland — Kauer, James Charles 17 East High School

OREGON

Eugene — Diebel, Robert Norman 17 Eugene High School

PENNSYLVANIA

Abington — Handschumacher, Robert Edmund 17 Abington Senior High School
Altoona — Weinberger, Hans Felix 16 Altoona Senior High School

RHODE ISLAND

Wakefield — Spink, Walter Milton 16 South Kingstown High School

TENNESSEE

Columbia — Dale, Alice Beck 17 Central High School

WISCONSIN

Green Bay — Hall, Robert Leonard 17 East High School
Madison — Wingert, Ann 16 West Senior High School
Milwaukee — Sinclair, Robert MacKenzie 17 Shorewood High School
Neenah — Ellis, Russell Ray 17 Neenah Senior High School
Ripon — Tinkham, Michael 16 Ripon Senior High School

ENGINEERING

Aircraft Illumination

More complete lighting of runways in commercial airports is the solution for safer landings rather than stronger headlights on planes.

➤ MORE COMPLETE lighting of runways in commercial airports, so that they glow as ribbons with no reflections, is the solution for safer landings at night, rather than stronger headlights on the planes themselves. This is the opinion of W. W. Davis of United Air Lines, Inc., expressed at the meeting of the American Institute of Electrical Engineers, in New York.

All phases of aircraft illumination were discussed by Mr. Davis, who reminded his hearers that the first attempt at night flying was probably that made by Pilot Jack Knight of the air mail service in 1921, and that in 1923 the first night-flying section of the air mail service was set up. This was between Chicago and Cheyenne, Wyo. In 1926 one manufacturer of aircraft advertised a plane complete with night-flying equipment, including landing lamps and running lamps.

Landing lights on the plane generally are positioned in either the nose or the wings. There is a definite objection to the position in the nose in fog, snow or rain, he said, because the light is reflected from the individual particles and in effect detracts from what can be seen through the beam when one is looking directly down the beam or the tunnel of light.

"It has been found, however, that this condition can be improved materially," he stated, "when the lights are located in the wing some distance outboard from the fuselage."

The two beams cross each other well ahead of the plane. With this arrangement the runway and small objects on it can be seen with less difficulty than when the pilot is looking straight down a tunnel of light such as is normally formed by nose lights.

Science News Letter, February 3, 1945

Cabin-Supercharger Drive

➤ "CABIN SUPERCHARGING is becoming extremely important as flight ceilings for military aircraft are extended upward," according to a paper by F. W. Godsey, J. D. Miner, Jr., and O. C. Walley, all of the Westinghouse Electric & Manufacturing Company, presented at the same meeting. "Many different schemes have been worked out for using main-engine power to drive variable-speed blowers at speeds which will maintain the desired air-flow and cabin pressure at various altitudes."

Aircraft cabin-supercharger devices are required to deliver an increasing volume of air as the altitude increases. "It usually is desired to maintain outside pressure up to 8,000 feet; to maintain the pressure equivalent of 8,000 feet from 8,000 to 30,000 feet; and then to let the cabin pressure decrease at higher altitudes to maintain safe pressure differentials," they explained.

A variable-speed centrifugal blower provides a suitable source of air delivery but requires a means of coupling it to the main engine to permit its operation at various speeds as needed. The speakers described an electric motor to operate the blower that has been built and tested, and also a simple regulator to control the current and voltage delivered. Further tests will probably be made by the Army Air Forces at Wright Field.

Science News Letter, February 3, 1945

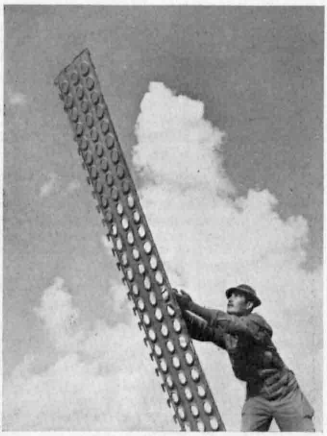
Induction Heating

➤ GENERAL PROBLEMS of heating iron or steel strip by induction were analyzed at the meeting by Robert M. Baker of the Westinghouse Research Laboratories, who referred to the relatively new process, in tin-plating electrolytically, of heating the iron strip by the use of high-frequency current to the melting point of tin, so that the tin as deposited is melted and flows into a uniform, tightly adhering layer, while the strip is moving at speeds up to 1,000 feet a minute or more.

This application, he says, requires the use of vacuum tube oscillator equipment (frequently about 200 kilocycles) because of the thinness of the strip to be heated. There are, however, many possible applications of induction heating to thicker iron or steel strip, he stated, which may be accomplished by rotating machines having an upper practical frequency of about 10,000 cycles per second. There is practically no limit on the thickness of strip which can be heated by induction, Mr. Baker finds, and strip widths up to four or five feet can be satisfactorily handled. He described simplified handling and heating equipment designed in his laboratories.

The discussion was limited to iron or steel strip which is ferro-magnetic, because such paramagnetic metals as copper, aluminum and brass cannot be satisfactorily heated by the usual process of induction heating, he said. Iron and steel lose their ferromagnetism between 700 and 800 degrees Centigrade and cannot be heated economically above this temperature by this method, he added.

Science News Letter, February 3, 1945



QUICK SURFACE—Metal strips are used to lay down an air field on newly conquered territory after the air strip has been smoothed off. This enables fighters, bombers and transport planes to operate near the front lines. A mat is shown being laid by a member of the aviation engineer group of the Mediterranean Allied Air Forces.

Subway Control

➤ THE NEW Chicago subway, the first section of which was opened to the public in October, 1943, has a complete electric system under the control of a single operator. It has several new features which have not been used on previous supervisory-control installations. They were described at the same meeting by W. A. Derr, West- (*Turn to page 75*)

DIRECTIONS. Four possible answers are given for each question. Put an X in the answer box corresponding to the number of that answer which you think is **most nearly correct.**

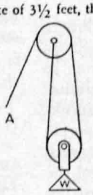
1. The application of a substance to a moving part in order to reduce the friction is called
( ) *1.* lubrication
( ) *2.* dilution
( ) *3.* plating
( ) *4.* adhesion

2. The densities of aluminum, copper, and lead are 2.7, 8.9, and 11.3 respectively. Three cylindrical containers 12 inches in inside diameter and 12 inches high were constructed of sheets of the metals ⅛ inch thick, one of aluminum, one of copper, and one of lead. When filled with alcohol, density 0.794, which container will weigh the most?
( ) *1.* aluminum container
( ) *2.* copper container
( ) *3.* lead container
( ) *4.* all will weigh the same

3. The number of meters per second which a bullet travels is its
( ) *1.* acceleration
( ) *2.* metric capacity
( ) *3.* trajectory
( ) *4.* velocity

4. When a substance is made impure by the addition of a foreign substance it is said to be
( ) *1.* hydrogenated
( ) *2.* purified
( ) *3.* carbonated
( ) *4.* adulterated

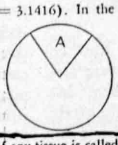
5. In order to raise the weight W a distance of 3½ feet, the rope A must be pulled through how many feet?



( ) *1.* 5¼
( ) *2.* 7
( ) *3.* 8¾
( ) *4.* 10½

6. What number is represented by the symbol △ in the number series 179, 281, 384, △, 593, 699?
( ) *1.* 486
( ) *2.* 487
( ) *3.* 488
( ) *4.* 489

7. In a circle there are 2π radians ($\pi = 3.1416$). In the accompanying diagram, about how many radians are subtended by angle A?



( ) *1.* 1.00
( ) *2.* 1.25
( ) *3.* 1.50
( ) *4.* 1.75

8. The word *sidereal* is most likely to be used by
( ) *1.* an astronomer
( ) *2.* an electrical engineer
( ) *3.* an actuary
( ) *4.* a chemist

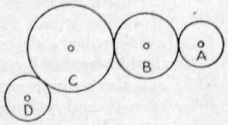
9. Which of the following is not a primate?
( ) *1.* orang utan
( ) *2.* gibbon
( ) *3.* lemur
( ) *4.* lemming

10. Two pulley wheels are connected by a belt. The larger wheel is twice the diameter of the smaller wheel. Since the circumference of a circle may be found by multiplying the diameter by π (= 3.1416), the ratio of the circumference of the larger wheel to that of the smaller wheel is

( ) *1.* 2.0000
( ) *2.* 3.1416
( ) *3.* 6.2832
( ) *4.* 8.0000

11. A kilogram (1,000 grams) is equal to 2.2046 pounds. There are 15,432.356 grains in a kilogram. How many grains are there in an ounce?
( ) *1.* $\frac{1{,}000}{2.2046} \times \frac{16}{15{,}432.356}$
( ) *2.* $\frac{15{,}432.356}{(16)\ (2.2046)}$
( ) *3.* $\frac{15{,}432.356}{2.2046} \times 16$
( ) *4.* $\frac{(16)\ (2.2046)}{15{,}432.356}$

12. In the gear train, gear A is the driver. The diameters of gears B, C, and D are in the ratios 3/2, 2, and 1 respectively to that of gear A.
Which gear turns at the same number of revolutions per minute as does the driver A?



( ) *1.* B
( ) *2.* C
( ) *3.* D
( ) *4.* none of the three

13. Which leaf is serrate?

( ) *1.*

( ) *3.*

( ) *2.*

( ) *4.*


18. The increased resistance or hardness of any tissue is called
( ) *1.* infusion
( ) *2.* inflorescence
( ) *3.* infiltration
( ) *4.* induration

19. An organ concerned with aural phenomena is the
( ) *1.* cochlea
( ) *2.* ventricle
( ) *3.* tongue
( ) *4.* cornea

20. What is the numerical value of x in the series 4, 3, 2, 7, 24, x, 118?
( ) *1.* 36
( ) *2.* 47
( ) *3.* 59
( ) *4.* 71

21. Which of the four words fits least well with the other three?
( ) *1.* budding
( ) *2.* metamorphosis
( ) *3.* gamogenesis
( ) *4.* proliferation

27. Which of the following is lentoid?

( ) *1.*

( ) *3.*

( ) *2.*

( ) *4.*


28. The minimum number of plane surfaces which a prism may have is
( ) *1.* 3
( ) *2.* 4
( ) *3.* 5
( ) *4.* 6

29. Which of the four words belongs least with the other three?
( ) *1.* quiescent
( ) *2.* dormant
( ) *3.* latent
( ) *4.* inert

paragraph carefully. The questions are based on the information given. given for each question. Put an X nding to the answer which you think

are three kinds of definition. The rmal definition. In this kind, a term ed, that is, put into the group (or s by reason of its similarity to the up; and by being identified, that is, members of its class by some dis- hat distinguishes it. The second type his consists of telling what a thing what it is; the definition is formed The third form is genetic definition, f things in terms of the way they ived.

AGRAPH A:

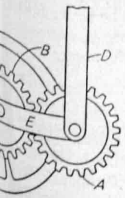
aning" is the body of interpretative ory conceptions which are used in ce. This definition is

ous

on should
ssential object of the thing to be

ning of terms
hat are teleological
egatively

is attached rigidly to the connecting the same shaft as is the flywheel C. driven by a piston which moves for A to make a complete revolution



GRAPH E:

gear arrangement is to change
to rotary motion
ciprocal motion
ary motion into variable speed
n
otary motion into intermittent mo-

same number of teeth, and C has that of A. When gear A travels B at 100 r.p.m., how rapidly olve?

diameter of B and one-half of the revolutions would C make while tion around B?

53. A definition that combines formal, teleological, and genetic aspects in the same sentence bears what relationship to the class of objects defined?

( ) *1.* mutually exclusive
( ) *2.* similar for the most part
( ) *3.* homogeneous
( ) *4.* equivalent

54. An earthworm is "any of numerous oligochaetous worms (Lumbricus and allied genera) found in damp soil whose activity in loosening and mixing up the soil is estimated to be valuable in crop production." This definition is

( ) *1.* genetic
( ) *2.* genetic and formal
( ) *3.* teleological and formal
( ) *4.* formal

55. "Sodium is a silvery white metal, can be readily molded and cut by a knife, oxidizes instantly on exposure to air, and reacts with water violently, yielding sodium hydroxide and hydrogen gas, consequently is preserved under kerosene, burns in air at a red heat with yellow flame. Atomic number: 11. Atomic weight: 22.997. Density: 0.97. Hardness: 0.4. Melting point: 97.5°C. Boiling point: 880°C. No isotopes, but of single atomic form: 23." The above definition may be classified as primarily

( ) *1.* formal
( ) *2.* genetic
( ) *3.* teleological
( ) *4.* genetic and teleological

PARAGRAPH F: The temperature at which the air becomes "saturated" with water vapor, so that the relative humidity is 100 per cent, is called the dew point. It is the temperature at which the maximum vapor pressure of water would be equal to the actual partial pressure of the water vapor in the atmosphere. For example, let the temperature of the air be 20°C., and the relative humidity 60 per cent. Then since the maximum vapor pressure of water 20°C. is 17.4 millimeters, the actual water vapor pressure is 0.6 of this or 10.4 millimeters. The temperature at which 10.4 millimeters is the maximum vapor pressure of water is 12°C. Hence if the air is cooled to 12°C., it will reach saturation and under suitable conditions dew will form; 12°C. is the dew point. Likewise if the dew point is known to be 12°C. when the air is at 20°C., it follows that the relative humidity is 60 per cent. The maximum vapor pressure of water at 30°C. is 31.5 millimeters, and at 25°C. is 23.5 millimeters.

QUESTIONS FOR PARAGRAPH F:

76. Under which of the following conditions is dew most likely to be observed?

( ) *1.* Little diurnal variation in temperature, high humidity.
( ) *2.* Great diurnal variation in temperature, low humidity.
( ) *3.* Great diurnal variation in temperature, high humidity.
( ) *4.* Little diurnal variation in temperature, low humidity.

77. In a large closed room, temperature 20°C., the relative humidity is observed to be 60 per cent. One infers that the dew point is 12°C. because

( ) *1.* 12 is 60 per cent of 20
( ) *2.* 10.4 is 60 per cent of 17.4 (approximately)
( ) *3.* $\frac{12}{20} = \frac{10.4}{17.4}$ (approximately)
( ) *4.* the ratio of the reading of a wet bulb to a dry bulb thermometer is 0.6

78. One summer day it was observed that the temperature was 86°F. (30°C.). At the local airport the dew point was reported to be 68°F. (20°C.). About what was the relative humidity?

( ) *1.* 79 per cent
( ) *2.* 66 2/3 per cent
( ) *3.* 55 per cent
( ) *4.* 50 per cent

T—These are sample questions taken from the Science Aptitude ken by 15,000 high school seniors. Only 3,000 were able to complete ments, including this examination and an essay on "My Scientific 40 top winners have been invited to Washington March 2 to 6 to ence Talent Institute and compete for the Westinghouse Science Scholarships, totaling $11,000.

GENERAL SCIENCE

Test Your Science Ability With These Questions

➤ DO YOU have an aptitude for science? This test will give you a hint as to whether you can aspire to scientific achievement. A super-quiz, of which this is only a part, was used in selecting high school seniors throughout the country who have a talent for science.

Try the test yourself and get several friends to take it. The questions reproduced on this page are the easier ones of the Science Aptitude Examination of the Fourth Annual Science Talent Search that has just been judged, so now anyone can try it.

It tests your information and how well you can read scientific material. Two kinds of questions are given. Answer all questions in the first part by putting an X in the answer box corresponding to the number of the answer which is most nearly correct. In the second part, first read each paragraph and then answer in a similar way each of the questions based on the information given. Finish all the questions in one sitting and do not look at the answers printed on page 76, until you are through.

The Science Aptitude Examination was made difficult purposely to eliminate those students who do not have the perseverance to finish a job, a prime requisite for a research scientist. Since no senior is required to take the test, any of these 14-to-18-year-olds were privileged to get up and leave after one look—and many did.

The test is only one of the techniques used in selecting 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. All these are used in choosing winners.

Of the thousands of boys and girls who have taken the examination, not one 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 this page. You should be able to answer the 31 questions in a little less than an hour.

Don't read fur- (*Turn to Page 76*)

PSYCHIATRY

Saving the Mentally Sick

Hundreds of men have been helped to turn from defeating themselves to defeating the enemy, thanks to the efforts of Major Merrill Moore.

➤ IN COMBAT with the XIV Army Corps' Service Command, Southwest Pacific—Hundreds of men all over this theater of war have been saved from breaking down under the combined strain of homesickness, tropical jungle heat, insects, and the ever-present threat of Jap bullets. They have been helped to turn from defeating themselves to defeating the enemy, thanks to the efforts of a poet-psychiatrist from Boston, Major Merrill Moore of the Army Medical Corps.

Among his more than 25,000 sonnets, Major Moore has written such lyrical lines as the following from *Only the Stars:*

You are the flower that spring has never brought
There, and the gold branch hidden behind the screen
Of leaves that no king's treasury has bought
Or ever could buy, O love unpriced, unsought.

Yet when it comes to dealing with soldiers, sailors, marines and air force personnel in the combat zones of the South and Southwest Pacific, Major Moore is intensely practical and realistic.

"No hooey!" is his motto. "Because," he says, "GI's won't stand for that. You can't kid them. They know all the answers. They know that the battle is the payoff."

Two Years' Experience

Major Moore, after more than two years' experience with GI's and other fighting men, knows quite a few of the answers himself. He can tell beforehand which men are most likely to become neurosis cases on D-Day or after several days of beachhead fighting. The soldier who lacks a hobby, who doesn't like to read, who can't even keep a tidy bunk is the man who tends to break down on D-Day or even before, while "sweating out" the waiting that is 90% of war.

In the last year he has helped "screen" several infantry divisions and has flown thousands of miles in a general's personal plane to give education lectures to officers of combat and non-combatant divisions. He teaches them how to distinguish between a gold-brick (which is rare) and the type of man who is substandard, immature, and unable to carry on normal duties as well as his normal buddies.

Bronze Star Medal

For "meritorious achievement" he has been awarded the Bronze Star Medal. In recommending him for this citation, his Commanding Officer said: "Your service at this base has been of the greatest benefit to the government and our war effort. Facing an immense problem, in your energetic and ingenious manner, you rapidly reduced the obstacle of psychoneurosis and related disorders.

"Of the large number of cases called to your attention by line officers or referred to you for diagnosis and treatment by medical officers, a remarkably high percentage was returned promptly to effective duty and the majority of the remainder was returned shortly thereafter."

Major Moore himself is confident that at least 10% of the potential neurosis cases can be saved from breaking down by the use of certain preventive measures which he calls "psychiatric first aid." These consist in regular athletic activities, group work and development of hobbies for which craft work is very valuable.

The tropics abound in beautiful woods, so Major Moore encourages wood carving. Light metals from Jap planes can be made into interesting bracelets, wristwatch bands, picture frames and rings. The Army's scrap plexiglass can be worked into many objects of art. Soap sculpture, painting and sketching, shell collections, and even the art of mounting butterflies are among the great number of special activities which he has developed here.

"It really doesn't matter what a man does," the Major says, "just so that it takes up his spare time and turns his attention away from himself and his worries. I find that nervous individuals who have hobbies and special interests get along better in the combat zone than ones who do not.

"If a man develops wholesome interests, he has something to look forward to at the end of a day. He will be a happier soldier and a better fighter. I have seen that principle prove itself on Guadalcanal, Munda, Bougainville and wherever combat has taken place in the South Pacific."

Often men get stale and say they have nothing to write home about. The man who complains of this has a real problem. But when he develops an outside interest that leads him into new contacts and brings him new thoughts, his letters home become more interesting and that much easier to write.

This idea of the mental health value of outside interests is an old one with Major Moore. Years before the war he was putting it into practice with his small sons. Whenever he went away to medical meetings, no matter how busy he might be with committee sessions, reports and other business he never failed to find time for the purchase of some special gift for the sons. Nor were these the usual souvenir type.

Small Prism

Once it was a small prism. Why a prism? Because, he explained, the little boys seeing its unusual shape and the rainbow when the light shone through it would start asking questions. Through it they might become interested in lighting, in physics, in a whole new world of interests outside themselves. Each gift he took them was picked with this same idea, that of stimulating their interest in the world around them.

Major Moore's own interest in the world around him is boundless. It has been said of him that each time he tried to revise one of his poems he failed because an idea for a new poem suggested itself instead. The subjects in "M," under which title one thousand autobiographical sonnets have been published, range from prize fights, cigarets and beer to love, death, time and philosophy.

His work with the soldiers is directed toward the man who is depressed over homesickness, or family troubles, dissatisfaction with his job, and the men who have become self-centered and lack wholesome interests and outlets for their feelings.

"If a soldier develops a defeated attitude and thinks that he is a failure," Major Moore states, "he mopes over him-

PSYCHIATRIST—Major Moore is shown in this Signal Corps photograph administering to a neurosis patient near the front lines in the Southwest Pacific

self, 'stews in his own juice,' and soon he succeeds, paradoxically, in becoming a failure. The GI's have a more picturesque word for failure."

Simple exercises in relaxation, concentration and thought control are given these men who are thus encouraged to use their minds to help themselves instead of tearing themselves down as some soldiers tend to do.

Generally speaking, the soldier who most needs help from the personnel officer and the noncoms is the one who is a round peg in a square hole, or the man who has some unfortunate combination of low intelligence, a disturbed family background, poor training in childhood, little education or an unsatisfactory pre-Army work record.

"Some people have claimed that the Army breaks men down. That is not true," Major Moore declares. "Men do break down and the Army finds it out, but usually they are the ones with a past history of nervous disorder before they came into the Army. They are 'betrayed by what is false within,' by their own neurotic tendencies that we try to help them correct.

"The Army does not break them down. Most of their buddies go through the identical experiences and they do not break down. The Army actually builds men up. Most of our work in the Army in mental hygiene and along preventive lines is educational and corrective work. Army psychiatrists have to spend a great deal of time giving men training they should have received in their homes and teaching them things they should have learned in school.

"The Army actually does build character in men who are capable of developing it. That applies to the work and the discipline that men have to undergo. I have never seen anyone in the Army injured by work or discipline. We could actually do with more of both. When men work hard and become well disciplined they tend to become more adequate and better organized. Even those men who are basically inadequate or disorganized tend to improve."

Science News Letter, February 3, 1945

EXPLORATION

Land Rescue Expedition For Plane Crash Victims

See Front Cover

➤ CLIMBING where men have never gone before, the soldiers of the Air Base Land Rescue Squad, seen in the official U. S. Army Air Forces photograph on the front cover of this SCIENCE NEWS LETTER, went from Elmendorf Field, Alaska, in one of the largest land rescue expeditions ever attempted to recover the bodies of the victims of a plane crash.

The plane, a C-47, of the Air Transport Command, was wrecked on a nameless mountain in glaciated country near Mt. McKinley. This reconnaissance party climbs one of Alaska's unsurveyed and unmapped peaks. They are believed to be the first to climb this mountain.

Science News Letter, February 3, 1945

CHEMISTRY

Kitchen Fats Used in New Rocket Propellant

➤ THE AXIS will feel the blast of your waste kitchen fats in at least one new propellant that has been tailor-made for rockets. Developed by Army Ordnance in cooperation with the Hercules Powder Company, the new propellant gives rockets increased accuracy and makes them more effective. It comes in five-foot sticks, round or cross-shaped in cross-section. The new propellant contains nitroglycerin, instead of nitrocellulose, used heretofore. The propellant uses 50% nitroglycerin, made from waste fats turned in by patriotic housewives.

Chief of the new rocket manufacturing problems is the propellant. This involves not only the propellant itself, which must possess certain qualities of stability through a wide temperature range and a desirable rate of burning, but also the problem of forming it into sizes and shapes suitable to mass production techniques. Few of the propellants used in rockets today were developed especially for rocket use. In most cases they are modified forms of other propellants and were developed rapidly to meet the urgent need for combat tactics.

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From Page 71

inghouse Electric & Manufacturing Co., C. J. Buck, Chicago Rapid Transit Co., and J. A. Stoos, Chicago Department of Subways and Super-highways.

The installation is the so-called visicode type of supervisory-control equipment, which operates over a single pair of wires between the dispatching office and each of the remote-control centers. It operates by means of direct-current impulses. The dispatcher, to send a message, turns an associated twist key to the proper selection position, and presses a master control button. A relay at the remote control center returns a duplicate code to the dispatching office as a check.

Science News Letter, February 3, 1945

LANGUAGE IS POWER

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Do You Know?

Evergreen shrubs and trees should not be pruned in the fall or winter.

Telephone service spanned the American continent first in 1915.

Most American *flyers* want a glass of milk first, when they return from missions over Germany, it is reported.

Strawberry beds in sections where the temperature drops below 20 degrees or so should be protected with a four-inch covering of hay, straw or leaves.

Parsnips, salsify and Jerusalem artichokes are among the relatively few food plants that may be left in the ground all winter and used as needed.

Theater programs that may be read in the dark as a possibility in postwar days; either the paper or the ink will contain phosphorescent pigments.

Henequen, the fiber of which is used to make twine, rope and cordage, grows well in Cuba because of the limy nature of the soil.

Cuba has at least ten recently drilled *oil wells;* all are very light producers but the crude oil is of light gravity and can be used as motor fuel in its natural state.

Connecticut claims three unusually large *trees:* the Wethersfield elm, 30 feet in circumference breast-high; the Ashford oak, 23 feet in circumference; and the Cornwall Eastern Hornbeam, or ironwood, nearly seven feet in girth.

Hens can be kept at relatively high egg production during the summer by increasing their consumption of concentrated foods, including mash, and decreasing green foods and fat-producing corn.

Japanese beetles are being fought successfully in New York state with a species of wasp, and also a fly that closely resembles the common house fly; both were imported a few years ago from Japan.

The ordinary *tin can* in which food is preserved is less than 2% tin and over 98% steel; steel gives the strength, and tin the weather-stripping and insulation that provides extra protection to the can's contents.

FORESTRY

Bombs to Photographs

➤ FIGHTER PILOTS from the Army and Navy may have an opportunity to switch from bombing Nazis and Japs to making pictures, possibly in color, of our American forests from the air after the war, reports Raymond D. Garver, National Director of the Forest Survey with the Forest Service of the United States Department of Agriculture. He stated that the government is going to have to depend on many veterans to carry out various programs in forestry.

"It's difficult to say at this time how large a program of public works will be carried on in the forests after the war, but there'll be veterans in the Forest Survey to put into play some of the new inventory techniques we've got up our sleeves," Mr. Garver stated, speaking on the CBS program "Adventures in Science," with Watson Davis, director of Science Service.

He announced that the forestry situation in the United States is serious today. Out of 462,000,000 acres of commercial forest land, 77,000,000 acres are practically non-productive, and of the remaining area, all but 100,000,000 acres has been cut over. Of this cutover land, a large portion is now producing at only a fraction of its potential capacity.

"Destructive logging, fire, insects, and disease seriously impair the productivity of much of our valuable forest lands," Mr. Garver commented.

In the name of war, he stated, we are witnessing needlessly destructive cutting in our mature timber lands, and the sacrifice of far too many young, growing trees. To supply all the wood that is still needed for the war machine and at the same time reserve enough thrifty growing stock to produce timber for our future needs is our big problem right now.

"We feel that all commercial forest lands can be kept productive by giving the public reasonable control, through basic federal legislation, over cutting and other forest practices. About 90% of our forest products comes from private timber lands," Mr. Garver pointed out.

Mr. Davis pointed to the splendid work that the nation's youth is doing in wartime to help protect our forests, when adults must devote their energy to the business of fighting. He particularly recognized the activities of the Alpha Sigma Rho Club of the Joseph T. Robinson High School, Little Rock, Ark., and the Junior Omicron Science Club at St. Joseph's High School, Dixon, N. Mex., both members of Science Clubs of America. These clubs are actively participating along with many of the 6,000 other science clubs, in an official Forest Service co-project.

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From Page 73

ther. Cover up the following paragraph until you have taken the test.

The correct answers to Part I are: 1., 2., 3., 4., 5., 6., 7., 8., 9., 10., 11., 12., 13., 14., 15., 16., 17., 18., 19., 20., 21., 22., 23., 24., 25., 26., 27., 28., 29. The right answers to Part II include: 51., 52., 53., 54., 55., 72., 73., 74., 75., 76., 77., 78.

If you answered correctly 16 or 17 of the questions, you did about as well as the average high school student completing the examination. Those of you who guessed only eight or ten correctly did no worse than some of the contestants with lowest scores. Anyone giving the proper answer to 25 or 26 of the questions probably is gifted in science. But remember, the questions given here are the easier ones included in the examination.

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AERONAUTICS

Bomber Crew Taught To Fly on Ground

➤ THE NAVY teaches a bomber crew to fly on the ground in a training device that resembles a big, twin-motored Martiner flying boat. It has all the flight controls and instruments that are in the real planes, as well as electrical computing mechanisms which enable the instructor to check on what the pilot, navigator and other crew members are doing.

The crew encounters the same problems that it will have in a real plane later on during take-off, flight and landing. To make the effect even more realistic, engine noise is heard and hull vibration experienced.

The elaborate trainer was developed by Bell Telephone Laboratories in cooperation with Capt. Luis de Florez, head of the Bureau of Aeronautics Special Devices Division as a step in taking many unnecessary risks out of naval training flights.

Trainers for other types of planes are now under development.

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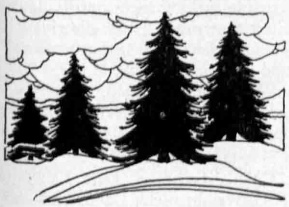
ECOLOGY

NATURE RAMBLINGS

by Frank Thone



Early Dividends

PLANTING trees has come to be thought of as a long-term investment. In a dozen years we can expect to harvest fenceposts; pulpwood cuttings may be ready in 20 years, sawlogs perhaps in 40. Even the indirect benefits of forest growth, especially water and soil conservation, are usually presented in terms of the mature forest: the thick sponge of decaying foliage, the porous soil underneath, the interlacing network of tenacious roots—all of which represent the slow work of years.

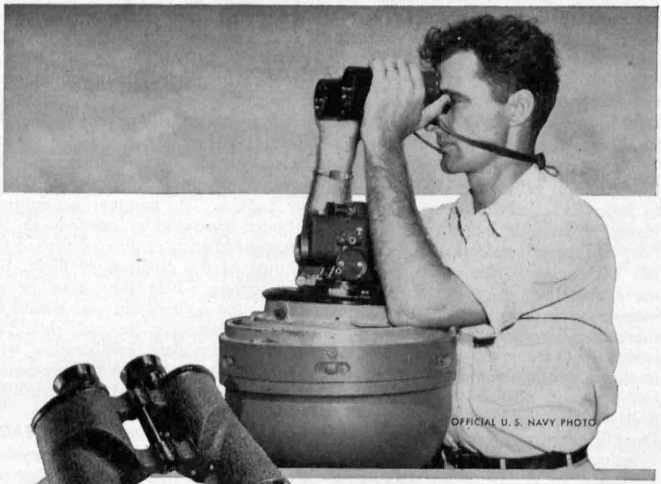
But we need not await the coming of these full-term dividends; at least small returns begin to come in almost as soon as our saplings have been set out. Any proper planting nowadays, whether of trees or shorter-lived crops, follows contour lines. It is also an increasingly widespread practice to form a water-catching basin in the soil around each individual tree that is planted on a hillside. Thus water conservation is immediately begun, and with it the first steps in checking soil erosion.

Although woodlands are expected to yield some returns in the form of pasturage for cattle, it is necessary to exclude livestock until the young trees get a fair start, lest they be damaged or destroyed by browsing. This period of grace gives grasses and other herbage a chance to gain a better foothold on the thinned or denuded slopes, thereby giving the soil at least a thin cover against the bombardment of the rain; and even more important, getting a first soil-holding webwork of roots into place.

Winter snows and thaws underscore, in sharp lines of black and white, the benefits of even young plantings. If you will go out, on the second or third day of a winter thaw, you will notice how much snow still lies in the shadows of small trees and bushes, even of grass tufts and weed clumps, after open spaces are all melted bare. This is partly because of the slowing-down effects of even slight shelter on the melting process, but partly also because there was more snow in these little shelters to begin with: the tree or shrub (even if not an evergreen) serves first as a windbreak, encouraging drift accumulation, then as a partial sunshade. Net result is less runoff, and more water soaking into the ground where the young trees are.

Science News Letter, February 3, 1945

Nylon, now used for insulation on electric wires, has many advantages, being resistant to fire and to most solvents except alcohol.



Bausch & Lomb 7x, 50 mm Binocular

B&L "HARD COATING" means a sharper image . . . . a brighter image

Through "hard coating" treatment of binocular lenses and prisms, Bausch & Lomb has achieved a 50% reduction of light loss due to surface reflections. Thus, the handicaps of poor light conditions are minimized—brighter, more clearly defined images are assured.

This important increase in light transmission is a definite advantage to our keen-eyed observers upon whose accuracy of observation so much depends. At dusk, in fog—under all adverse lighting conditions—this extra brilliance and extra definition may mean the difference between sight of an enemy plane or ship and a blank wall.

The optical system of every Bausch & Lomb Binocular—and many other B&L military instruments—receive this permanent coating treatment. To you, who plan on purchasing new binoculars after the war, this spectacular gain in light transmission represents another reason why Bausch & Lomb will be your choice.

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BAUSCH & LOMB IS DESIGNER AND PRODUCER OF BINOCULARS, SPOTTING SCOPES, RAY-BAN SUN GLASSES AND A COMPLETE LINE OF OPTICAL INSTRUMENTS

AERONAUTICS

Postwar Competition

➤ OTHER MEMBERS of the United Nations are already undertaking ambitious plans to surpass American research equipment so that they can excel in the air, thus foreshadowing vigorous commercial competition among the United Nations for air superiority, Dr. Jerome C. Hunsaker, chairman of the National Advisory Committee for Aeronautics, told Rep. Woodrum's House Select Committee on Postwar Military Policy. It is essential to continue research so as to assure American leadership in military aviation development, Dr. Hunsaker warned.

He told the committee that the NACA believes it to be in the public interest to foster increased civil use of the airplane, for domestic and international air lines and for private operation. A vigorous civil aviation can affect favorably our domestic and international relations, both economic and cultural. At the same time, it will contribute to national security by the support of a reserve of airplanes, operating and manufacturing facilities, and civilians trained in the skills which are critical in time of war, Dr. Hunsaker pointed out.

While some of the results of wartime research can be applied directly to new designs of civil airplanes, Dr. Hunsaker remarked that there are further opportunities for substantial improvement in the performance of aircraft and equipment which can be realized only by a vigorous research program.

"Experience clearly indicates that in time of peace the application of research results to military and naval objectives is extremely important. Possible military applications must be explored by continuous experiment and testing by professional soldiers and sailors as a life work," he declared.

Dr. Hunsaker called attention to the fact that the effects of accelerated enemy research and development in preparation for war helped to create an opportunity for aggression which they promptly exploited.

He recommended continued cooperation among government agencies on postwar research in aeronautics. These agencies include the Army Air Forces, BuAer of the Navy Department, the Civil Aeronautics Administration, and the NACA. The program he outlined included fundamental research in the aeronautical sciences directed toward the solution of the problems of flight. Results, except where they must be restricted for military reasons, should be published promptly. Research should be conducted in close collaboration with technical personnel from Government agencies concerned and with qualified representatives from industry.

Dr. Hunsaker pointed out that NACA research does not include the development of specific aircraft or equipment. However, its research facilities may be used to assist government agencies or private industry (if the investigation is in the public interest) wherever other suitable facilities are not available.

Science News Letter, February 3, 1945

No Present or Post-War Priorities Needed for Houses of Earth •

The ground you stand on is your best building material. Easy to build—insulated against heat and cold. Rat proof—Sound proof—Termite proof and Fire proof, Approved, endorsed by U. S. Government Departments. Lowest Building and Upkeep costs. •

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Containing complete building instructions and 18 illustrations mailed upon receipt of $1.00.

A. B. LEE
Box 171 Washington, D. C.

MILITARY SCIENCE

Public Invited to Give To Wright Field Library

➤ A NEW and important library collection on military aeronautics has been started by the Air Technical Service Command of the Army Air Forces at Wright Field. The collection already numbers more than 3,000 volumes and is used daily by research engineers assigned to development and experimental projects. Many early books on aviation subjects, some dated as early as 1784, provide valuable historical background, while more recent technical data, American and foreign, are essential to the ATSC's responsibility for development and experimentation on new aviation equipment.

Miscellaneous material, including air combat intelligence reports from World War I and back issues of aviation magazines and newspaper clippings on aviation subjects, have also proved valuable.

In order to accomplish its objective to develop this collection of technical and historical items, the ATSC invites the public to contribute pertinent material to the Wright Field Library. Persons interested in making such contributions are invited to write a letter describing the document they have, before sending the actual material. Acceptable items will be photostated and returned, if desired. Official credit will be given to each contributor.

Correspondence should be addressed to: Chief, Technical Data Laboratory, ATSC, Wright Field, Dayton, Ohio.

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CHEMISTRY

Uses for Plywood Tubing Are Almost Unlimited

➤ PLYWOOD tubing, one of the newer developments of the plywood manufacturing industry, is now used extensively by the armed services for antenna masts, reinforcing members, large rafts, and various sectional types of construction. After the war it probably will be used widely because of its strength, lightness and ornamental qualities.

In the postwar field, makers predict that the tubing will be used extensively for radio and television masts, stepladders, tripods, reinforcements for prefabricated construction, and for many decorative purposes since the plywood is said to give a more attractive grain effect than solid turning. In the latter class would come, for example, clock cases and ornamental uses in both interior and exterior of buildings.

Several different types of wood are used in the tubing, and the bonding adhesive may be either phenol formaldehyde which meets new and rigid government requirements, or urea formaldehyde which is waterproof but not boilproof. Wall thickness may vary according to strength needed. The tubing can be made by the convolute or spiral winding methods.

Because the tubing is made in different sizes, makers also believe it will be widely adapted to such products as radio masts which can be telescoped down to a short length for easy handling. One manufacturer has produced a mast which can be extended to 90 feet, but will close up to six to eight feet.

Science News Letter, February 3, 19

Books of the Week

AN INTRODUCTION to the subject of the phenomenon of vibration is given in clear, understandable language in VIBRATION ANALYSIS by N. O. Myklestad, (*McGraw*, $3.50). This is an important book in that it is the first of its kind to provide an elementary introduction into the subject for designers and engineers who wish to make more comprehensive studies of vibration later on. Not for novices.

Science News Letter, February 3, 1945

OVER 6000 TERMS relative to aviation and aeronautical science are defined in THE AERONAUTICAL DICTIONARY by Thomas A. Dickinson, Comprehensive enough for the engineer, yet easily understood by the novice. Where words won't explain a term, well-drawn sketches or diagrams do the job. Not a rehash of other aeronautical dictionaries, but a fresh departure in the field with up to date definitions, (*Crowell*, $2.75).

Science News Letter, February 3, 1945

A NON-TECHNICAL view of the "flying-windmill" is given in PIONEERING THE HELICOPTER by C. L. Morris, who was Chief Test Pilot for Sikorsky Aircraft, one of the pioneers in the field. A valuable source and reference book as well as good reading. Illustrated with many photographs and diagrams. (*McGraw*, $2.75).

Science News Letter, February 3, 1945

A FRAMEWORK which students of engineering and physics, as well as those who take flying seriously, can use in attaining thorough knowledge of aerodynamics is given in THE PHYSICS OF FLIGHT by Alfred Lande, (*Reinhold*, $2.50). Clear discussion of instruments of navigation, and a good dictionary of air terms in the back. Convenient size, and lightweight so novice airmen can keep it handy.

Science News Letter, February 3, 1945

Just Off the Press

AIR NAVIGATION, NAUTICAL ASTRONOMY AND CELESTIAL NAVIGATION—*McGraw*, 198 p., illus., $2. (Flight Preparation Training Series, part 7).

THE AMINO ACID COMPOSITION OF PROTEINS AND FOODS, Analytical Methods and Results—Richard J. Block and Diana Bolling—*C. C. Thomas*, 396 p., illus., $6.50.

CHEMICAL RESULTS OF THE CRUISE OF THE CARNEGIE—Herbert W. Graham and Erik G. Moberg—*Carnegie Inst.*, 58 p., paper, illus., $1.

CRIME AND THE HUMAN MIND—David Abrahamsen—*Columbia Univ. Press*, 244 p., $3.

FUNDAMENTALS OF PHYSICS—Henry Semat—*Farrar*, 593 p., illus., $4.

FUNDAMENTALS OF PSYCHIATRY — Edward A. Strecker—*Lippincott*, 219 p., illus., $3, 2nd ed.

THE HONEYBEE, Source of the World's Most Famous Food—Frank C. Pellett—*F. G. Brooks*, 16 p., paper, illus., 10c (Bios Classroom Series, no. 2).

IN THE BEGINNING, the Origin of Life—C. T. Hurst—*F. G. Brooks*, 16 p., paper, illus., 10c (Bios Classroom Series, no. 4).

OBSERVATIONS AND RESULTS IN PHYSICAL OCEANOGRAPHY—H. U. Sverdrup and others—*Carnegie Inst.*, 156 p., paper, illus., $1.75.

THE OYSTER—R. V. Truitt—*F. G. Brooks*, 12 p., paper, illus., 10c (Bios Classroom Series, no. 3).

YOUR RESPIRATORY SYSTEM—Herman Pomeranz—*New Home Library*, 298 p., illus., 69c.

Science News Letter, February 3, 1945

CHEMISTRY

Compressed Wood Returns To Size After Swelling

A PROCESS of densifying wood by compression, in such a way that the wood, although swelling appreciably by the absorption of atmospheric moisture, returns on drying to its original compressed thickness, has been developed at the U. S. Forest Products laboratory in Madison, Wis. Woods compressed by usual methods tend to recover their original uncompressed dimensions. In the new process the wood is compressed at a higher temperature and moisture content than are normally used.

"Staypak" is the name by which woods compressed by this new method will be known. "Compreg" is the name applied to woods compressed by the usual process. The behavior of compreg with respect to recovery of its original dimensions varies, depending upon the conditions under which it is manufactured. It can be made (but usually is not) with negligible springback tendencies. Staypak has practically no springback tendencies and is stronger than all compregs. Its impact strength is about double that of compreg and the tensile and bending strengths are approximately 25% greater.

Staypak is made by compressing the wood under conditions that cause sufficient flow of the lignin in it to relieve the internal stresses resulting from the compression. This requires a proper degree of heat and the proper moisture content. It is recommended by R. M. Seborg, M. A. Millett and A. J. Stamm, chemists at the laboratory who prepared a technical article on staypak appearing in *Mechanical Engineering* (January) that the wood be put into the press cold and then heated to about 220 degrees Fahrenheit at the center of the panel with platens at about 250 degrees.

The wood is compressed very slightly at first, but as the temperature rises to 220 degrees the compression becomes virtually complete. At this temperature the moisture is not driven out of the wood to an extensive degree but the desirable amount is bottled up in it. Subsequent heating to 330 to 350 degrees Fahrenheit, after the compression at 220 degrees is fairly complete, causes the desired stabilization.

Science News Letter, February 3, 1945

WARD'S *Explano-Mounts*

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• Combining actual specimens, concise pertinent text and accurate explanatory drawings, Ward's Explano-Mounts insure correct observations on the part of students and save time by showing exactly what to look for, where to find it, and what it means. Two series now available: Type I, Insect Explano-Mount, deals with insects and the vital biological principles which are taught with insects or examples; Type II, Micro-Explano-Mount, on botanical and zoological subjects, incorporates a microscope slide.

Write for Bulletin N-397 which describes and lists 67 currently available Explano-Mounts.

WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.
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•New Machines and Gadgets•

⚙ *WIENER vending machine, that operates when a proper coin is put into a slot, delivers a hot frankfurter-bun sandwich wrapped in a paper napkin with the meat cooked electrically a moment after the coin is deposited. The electric cooker includes a high-voltage, high-frequency diathermy coil.*

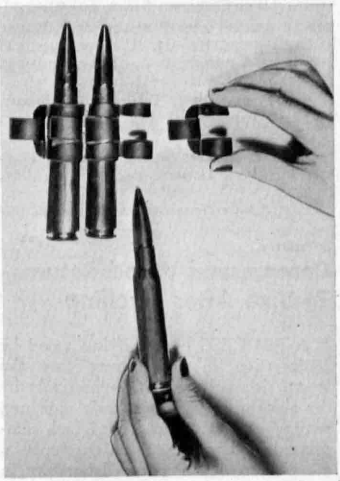
Science News Letter, February 3, 1945

⚙ *FIRE CURTAINS, to protect the roof and side walls of a house adjacent to a burning building, are made of fire-resistant fabric in sections which may be carried in rolls to the roof, fastened to a taut line, and unrolled to hang overlapping to the ground. Flying sparks lighting on it are harmless.*

Science News Letter, February 3, 1945

⚙ *ELECTRONIC control device on aircraft cameras automatically synchronizes the opening of the shutter with the bursting of a flash bomb, thus enabling observers to take night pictures from high altitudes showing the destruction caused by explosives dropped. It closes the shutter after exposure.*

Science News Letter, February 3, 1945



⚙ *CARTRIDGES used in machine guns are linked in a flexible belt with sections that are locked by the cartridges themselves, as shown in the picture. The loaded belt, of any desired length, is fed into the receiver of the gun. The caliber .50 cartridges are withdrawn automatically and inserted in the breech; the links drop out.*

Science News Letter, February 3, 1945

⚙ *ALL-STEEL water pleasure craft, 26 feet in length, is fabricated of seven pieces of steel welded and completely stress-relieved. The inexpensive boat, made of sheet metal with its interior construction also of steel, has more usable space than do similar boats made from wood.*

Science News Letter, February 3, 1945

⚙ *COCONUT MEAT extractor, recently patented, consists of several revolving cutting edges with an outside alignment about the shape of the inside of the coconut shell. They revolve on the same axis and, when pushed into the flesh, chip away the white meat without including the brown skin.*

Science News Letter, February 3, 1945

⚙ *HEADGEAR, which may be worn while working or sleeping, to protect against mosquitoes and other insects, consists of a ventilated hood covering the entire head, with a section made of netting over the face. This net is edged with a tubular rubber frame which becomes semi-rigid when inflated with air.*

Science News Letter, February 3, 1945

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 244.

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