

INVENTION

Invents Torpedo that Turns And Goes Back to Target

A TORPEDO that does the seemingly impossible in turning around and going back after the target it has just missed has been patented by Ellison S. Purington of Gloucester, Mass.

A trailing wire contains the secret of the performance of this newly-designed underwater weapon, the specifications for the patent, No. 2,121,446, reveal.

If the torpedo misses the target and crosses ahead of the ship it is aimed at, a wire trailing behind the torpedo is touched by the ship's bow, closing a contact and causing the torpedo to turn around and go back for a second try with its deadly cargo. The direction in which the torpedo will turn is determined by the direction of the ship it is aimed at, a manual setting of the torpedo being made just before it is fired. Little difficulty is anticipated on this last score because of the fact that a torpedo is fired from relatively short range.

The invention is assigned to John Hays Hammond, Jr., also of Gloucester. Mr. Hammond is noted as a torpedo inventor and designer of widely-used radio equipment.

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PUBLIC HEALTH

Preventable Smallpox Still Fells Thousands Each Year

IF THERE is any disease that it is almost criminal to have, that disease is smallpox. Ever since the time of Jenner, the simple process of vaccination prevents it at trivial cost and inconvenience.

America's largest city, New York, has been entirely free of smallpox since 1932 and no one has died of that disease there since 1926. That can hardly be said about any other human ill.

But the United States is not free from smallpox. In fact, this disease is on the increase. There were 11,806 cases in 1937 as compared with 7,844 the year before, according to Metropolitan Life Insurance Company figures.

This is disheartening to medical authorities. A few years ago it seemed that the disease was at last coming under control and would be eliminated as a major health problem.

Fortunately, the form of smallpox prevailing in the United States is mostly

the mild, non-virulent type which causes relatively few deaths. But this mildness may change to a more deadly form, killing hundreds or thousands before vaccination stops the march of a serious epidemic.

It is not the congested areas of the East that constitute smallpox's stronghold. The record of the past five years shows only 256 cases in eight crowded Eastern states, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland. There were 14,203 cases in eight less populous states in the opposite corner of the U. S. A.—Washington, Oregon, Idaho, Montana, Wyoming, North and South Dakota and Nebraska. The contrast was one case per million of population as against 428 cases per million.

This difference is merely a matter of how widely vaccination is practiced.

For smallpox flourishes in every clime and country if given the chance. Evidently only a devastating epidemic of the more dangerous kind of smallpox will teach a costly lesson where vaccination is lax.

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ICHTHYOLOGY

Fish Out of Water Seem To Die of Exhaustion

DEATH of fish out of water seems to be due to their violent struggles rather than to inability to get oxygen through their gills, concludes Prof. A. G. Huntsman of the University of Toronto (*Science*, June 24).

It has always been assumed that fish out of water die because atmospheric oxygen will not pass through their gills into their blood, but Prof. Huntsman states that he cannot find any really solid evidence in support of this assumption.

He does find, however, that tissues of captured fish after death have little or no glycogen, which is the energy-yielding animal sugar; also that their blood contains a high concentration of lactic acid, which is the typical chemical end-product of muscular exertion. This gives a physiological picture of death from over-exertion rather than from suffocation.

Further support for the new theory is found in the fact that nervous fish, like herring and haddock, die much more quickly when taken out of the water than do sluggish fish not given to strong struggles, like eels and catfish.

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IN SCIENCE

ARCHAEOLOGY

Camera and Plane Needed To Outline Roman Empire

WHEN ancient Rome was in power, the civilized world knew well enough where the guarded frontiers of Roman empire ran.

Today, it is taking the super-eye of the camera looking down from an airplane to find obliterated lines of that empire.

Work of mapping the whole Roman Empire was started in 1930 by an international commission of geographers. Since then various countries that control regions of the one-time empire have helped with the problem.

Ruins of old forts and roads and embankments have to be studied by the slow, hard process of excavation. But it is the flying archaeologists who have been scouting out the lay of the land for the excavators, and mapping for them the most elusive lines of lost frontiers.

In Syria, a French archaeologist, Père R. P. Poidebard, has done much to trace Roman fortifications from Bostra eastward toward the Tigris. His interest in aerial photography goes back to 1926.

Père Poidebard has learned by experience that in this desert country ruins appear and vanish even so far as the sharp eye of the camera is concerned. Not only the season but time of day and weather conditions affect sighting of phantom ruins.

Early morning and late afternoon light are best for sharpening the shadows and bringing out obscure patterns of ancient handiwork buried lightly in the earth. Yet, the French observer has outwitted the sun on occasion, making hidden ruins visible near midday by the trick of flying low and using the plane wing to shadow the ground. The first time he used this technique, he detected an ancient road leading toward the Tigris River, that previous observers had missed.

Once spotted, the ruins are marked on maps, and then the spade expeditions go out, to learn more about the frontier defenses in which ancient Rome put her trust.

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E FIELDS

PHYSIOLOGY

Sulfur Found Negligible In Air Pollution Effects

SULFUR vapors in the air, often cited as a major cause of air pollution, have been found to be an almost negligible factor as far as physiological effects are concerned, in a study recently completed in five large metropolitan areas throughout the nation. The results of the investigation, which lasted 15 months, were announced by the Air Hygiene Foundation and Mellon Institute in Pittsburgh.

Over 50,000 separate air tests were made by six chemists, during the study. They covered all hours of the day and all seasons of the year.

The area of Washington, D. C., is by far the cleanest of the five regions in its sulfur dioxide content, the report showed. The five, in the order of their sulphur dioxide pollution within a 15-mile radius of the center of the city are: St. Louis—average, .128 parts per million, and maximum, 2.266; Pittsburgh—.057 and .897; Detroit—.028 and .396; Philadelphia—Camden—.027 and .424; Washington—.009 and .290.

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MEDICINE

The Family Doctor's Success Explained by Freud's Theory

IT SEEMS a far cry from the good old family doctors of grandfather's day to Dr. Sigmund Freud, founder of psychoanalysis. To most laymen the famous Viennese psychiatrist is known chiefly for having indirectly brought sex talk into the parlor. Even those who understand a little of the basis of psychoanalysis probably fail to realize that Dr. Freud made many other contributions to medical science.

One of his great contributions is his concept of transference. This concept explains why the family doctor made you feel better the moment he entered the room. It explains why you are not much relieved and perhaps a little disappointed when, after being put through a whole battery of X-ray, blood-sampling

and stomach-pumping tests, the modern ultra-scientific and often expensive diagnostician gives you a "clean bill of health." The Freudian concept of transference even explains why quacks flourish in the land.

All this was recently pointed out by Dr. Winfred Overholser, superintendent of St. Elizabeths Hospital, the government institution in Washington for mentally sick patients, in a lecture at George Washington University School of Medicine.

The concept of transference refers to that transference which occurs between patients and physicians in which, to use Dr. Overholser's words, "the physician, to a large extent, takes the place of the father and becomes a crutch upon which the patient can lean."

The family doctors, without knowing or consciously practicing psychiatry, made good use of this concept. With the vanishing of this attitude between patient and physicians much of the effectiveness of the physician has vanished, Dr. Overholser says.

Because patients miss this crutch in many modern physicians, they accept readily the assurance, the crutch, held out to them by quacks and irregular practitioners.

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RADIO

U. S. Radio Amateurs Retain Their Frequencies

AMERICAN amateur radio operators, ever alert to the threat that they will lose their precious frequency bands to commercials or government services, successfully retained their allotted frequencies at the International Telecommunications Conference in Cairo, delegates of the American Radio Relay League reported.

Their European confreres, however, suffered reduction in the size of one of their bands and are forced to share another. The reductions came about because of the pressure of European governments interested in extending military, aeronautical and television frequencies.

The delegates, Kenneth B. Warner and Paul M. Segal, representing the A. R. R. L., the organization to which most American amateurs are affiliated, reported that the American hemisphere conference at Havana held earlier was a major factor in their success. Allocations for North and South America were settled there and they were able to present a united front in their defense.

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PSYCHOLOGY

Method of Child Discipline May Make or Mar a Leader

MANY nations are now facing political crossroads; people are being forced to choose between left and right and the less propagandized middle road of democracy.

When the voters of the United States are faced with such a decision, the outcome will depend to a large extent upon the way in which the little children of today are being trained in the home. If a boy is brought up to be dependent upon adult affection and approval, if he has learned to lean on others for guidance and decisions, is it not likely that as a man, he may be willing to sacrifice freedom for security and a life planned for him?

If he has been early freed from the shackles of paternal authority and maternal solicitude, and has learned to stand on his own two feet, to use initiative, to think for himself, will not his choice be very different?

At the Pennsylvania State College, a study conducted by Dr. Robert G. Bernreuter, psychologist, seems to indicate that the most intelligent of our children coming from culturally superior homes—those whose endowment would fit them to be leaders—are not being trained to be self reliant and independent of adults. They are not more socially mature or more able to do for themselves than are the run-of-the-mine children who are their inferiors intellectually.

Methods of discipline in the home have to do with developing this independence, Dr. Bernreuter found. Punishment is likely to spoil the personality, parental temper turns the child from reality, inconsistent discipline is the worst possible type.

The best form of discipline consists of permitting the natural consequences of the acts of the child to be the disciplinary agency, Dr. Bernreuter told a conference on education recently held at the Wood Schools.

Parents who permitted the acts of the child to discipline him are repaid by having children with more attractive personalities who are more ready to face reality, and, fortunately, who are more independent of adult affection, he said.

From among such fortunate children, the future leaders of America may be expected to arise.

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Ancient Babylon was proud of having a "road glistening with asphalt".