

the distribution of candle power from a light unit.

Miss Forbes started to work for the General Electric Illuminating Laboratory two years ago. Although she was not a high school graduate, she worked into a job usually done by an electrical engineer.

Out on the testing range, a big, gloomy barn of a place, it is all in the day's work to analyze a huge Army

billion-candlepower searchlight, then turn around and measure the light from a cigarette. With a "knack for math," Miss Forbes proceeded to find out how and why.

Now she knows how to make some 800 photometer readings. From these she computes, by slide rule and calculator, the curves showing the light distribution obtained by testing a unit.

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Urge Science "Scrap" Drive

► A NEW kind of "scrap" drive to discover, collect and use the "hidden treasure" of scientific discoveries laid aside and forgotten in laboratories, libraries and old reports and records, was urged by Dr. C. F. Burgess, of Chicago, pioneer in electrochemistry, in his address at Chicago accepting the Electrochemical Society's Edward Goodrich Acheson medal and \$1,000 prize.

Stressing the great progress being made by technology under the stress of war, Dr. Burgess said:

"The necessarily slow processes of science cannot compare in importance with the urgent, unromantic patriotic duty of all citizens in collecting scrap, not only that which lies on the surface, but more especially the hidden treasures in libraries, old reports and records—discoveries laid aside and forgotten.

"In this search," Dr. Burgess added, "scientists and the vast number of amateur workers can join forces and turn drudgery into romance in discoveries of value."

The electrochemical industry, an infant at the opening of the century, Dr. Burgess said has become such a powerful giant that it has been commandeered as a major agency in war. He predicted that remarkable developments under way will push upward the standards of life when peace arrives.

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Heat Affects Battery

► THE AUTOMOBILE storage battery loses its charge on standing three times as rapidly at 100 degrees as at 70 degrees Fahrenheit, but at 32 degrees the loss is vanishingly small. These are results of tests carried out by A. C. Zachlin of the Development Laboratory of the Willard Storage Battery Co., and reported to the Electrochemical Society meeting in Detroit.

Around 70 degrees, the usual automobile battery loses on standing about 1% of its charge per day, Mr. Zachlin said, so that at this rate it would in three months become practically discharged. The moral evidently is, if you have to store your car, store it in a cool place, preferably where the temperature is kept only slightly above freezing.

If the plates of a battery are made of pure lead, Mr. Zachlin pointed out, the loss on standing is reduced to practically

CHEMISTRY

Electroplating Surprise

Attempt to produce nickel powder results in coating on only one side of sheet; may have commercial use. Electrochemical Society hears of other advances.

► IN ATTEMPTING to produce nickel powder by rapidly electroplating the metal on a copper sheet, Dr. Oliver P. Watts, professor of electrochemistry at the University of Wisconsin, ran upon a strange phenomenon which he reported to the Electrochemical Society meeting in Detroit.

A coating of nickel appeared on the back of the copper but none on the front. This, he said, was contrary to all recorded experience with plating solutions. Furthermore, no nickel powder was produced.

Dr. Watts had tried to utilize that "bugbear" of the plater, the "burned" deposit, by passing a very large current of electricity through a dilute solution of nickel sulphate. This should have done the trick, because too heavy a current produces a crumbly deposit which frequently drops off.

To increase the conductivity of the solution and thereby increase the current, Dr. Watts had added a large amount of sodium sulphate to the solution and also heated it. Such "conducting salts" are frequently used. To his surprise he got only a film of alkali on the front of the plate but a good adhering coat of nickel on the back. Measurements showed that three-quarters of the current had been employed in depositing the alkali and only a quarter in depositing the nickel. The latter part of the current had to pass around the edges of the plate to reach the back. Usually in electroplating the front of an object is more heavily plated than the back.

Other metals and other solutions were tried and it was found that the same

thing could be done with cobalt and iron, but not as yet with tin, zinc or copper.

As a possible commercial use of this curious phenomenon, Dr. Watts suggests that the solution might be so regulated as to plate front and back equally, but so far he has been unable to get any happy medium between a thicker coat on the front or none at all on the front.

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Better Nickel Plating

Thick and extra hard coatings of nickel can be formed by adding ammonium salts to the plating bath, and properly proportioning the other ingredients, Dr. W. A. Wesley, assistant director, and E. J. Roehl, research chemist, of the Research Laboratory of the International Nickel Company of Bayonne, N. J., told the Electrochemical Society.

Many new problems arising in defense activities, the investigators said, involve surfacing of parts to resist wear and corrosion, and the salvaging of worn and mismachined parts, by the electro-deposition of heavy metal layers. The coatings must be hard, have strength, ductility, machinability, adhere strongly, and have a heat expansion close to that of steel. Furthermore, the deposits must not be in layers such as the old "hard baths" gave, but must be homogeneous.

By researches in the laboratory and on a pilot scale, these two chemists have produced and thoroughly tested new hard baths that give coatings conforming closely to all the desired qualities.

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nothing—to less than 15% per year. But pure lead is too soft for automobile batteries and it is customary to use lead containing 6% to 12% antimony. It is

this antimony, he indicated, which is responsible for the discharge on standing.

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PSYCHIATRY

Nerves Must "Take It"

British sailors who have case of "nerves" get no sympathy. Odd treatment prescribed. Other problems of Navy medicine are discussed.

➤ SAILORS in the British Navy who develop "nerves" from the strain of living and carrying out their duties in constant danger get no sympathy. Medical officers are told instead to be "hard but understanding" in treating such cases, Real Admiral Wilfred R. Patterson, chief of staff of the British Admiralty Delegation, told members of the Medical Society of the District of Columbia at their annual meeting.

Too much coddling has been found bad for such cases. Frequently the treatment consists in putting the man into conditions even more intolerable than those he complained about. A man might, for example, be told to stay in his hammock without smoking or drinking anything but water. A short time of such treatment proves so boring that the man is usually ready to return to the duties formerly considered intolerable.

The strain of sea duty under present conditions of warfare, in which the danger from submarines, bombers and torpedo planes lasts from dawn to after dusk every day and does not stop even when the ship is in harbor, is so great, however, that one year at a time is enough for those in responsible positions, in the opinion of Admiral Sir Andrew Cunningham whom Admiral Patterson represented at the meeting.

In recognition of this, the British Navy has houseboats on the Nile and hospitals on the sands at Alexandria for the men of the Mediterranean fleet to rest and recuperate from the psychological strain.

Men of good character and sober habits, contrary perhaps to general expectation, make better fighters and stand the strain of service on fighting ships better than the "tough guys who are always breaking up the pubs," Admiral Patterson said. Even the steadiest and best of the men, however, suffer reactions to the strain and overfatigue after

a time. This shows up in inability to sleep, among other symptoms.

Barnacles that grow on the sides of ships in tropical waters are a serious danger against which Admiral Patterson warned the American doctors who might have to handle patients from ships that go down. The sides of the ships are likely to be very slippery with oil so that men escaping from a sinking or overturned ship slide down very fast and are often badly injured by the barnacles.

In supplying life boats, water should predominate over food, he cautioned. Man can live 30 days without food but only five days without water, he pointed out. Biscuits and chocolates, frequently the chief food supplies for life boats, are both "well known thirst producers."

Men who are shipwrecked and must spend days in a life boat or raft should know in advance such practical matters as the advisability of cutting a piece off the bottom of a trouser leg to wrap around their heads for protection against the sun. They should also be prepared to overcome at once any aversion to using dead men's clothing for their own protection.

Experience with flash burns in this war has taught the need for wearing at all times overalls, helmets and even gloves, in spite of the discomfort in tropical weather.

Night blindness was at one time a problem on submarines, Admiral Patterson reported. Officers found that when they came up at night it took as long as nine minutes for them to be able to adapt their eyes to seeing in the dark—"a chancy business," he commented dryly. This problem has been overcome chiefly by improved diet for submarine officers and crew. The daily food for each man on a submarine now costs about 75 cents, while that for an ordinary sailor costs only 25 cents.

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CUTE EYE TEST—This little girl is having her vision tested on a new chart for children just announced by the American Optical Company. Mary was asked to recognize the animals and tell which way the E prongs point.

INVENTION

Simultaneous Neutron and X-Ray Pictures Now Made

➤ SIMULTANEOUS examination of an object by neutrons and by X-rays is provided by the invention of Hartmut Israel Kallmann, formerly known as Hartmut Kallmann, of Berlin-Charlottenburg, and Ernst Kuhn of Berlin, Germany. They have received U. S. patent 2,297,416, which is vested in the Alien Property Custodian.

These inventors have taken out two previous patents on neutron pictures.

Since the information given by neutrons, uncharged atomic particles, is different from that given by X-rays, the inventors say that it is desirable to examine an object in both ways, and that the radiation come in each case from the same direction. Their device makes it possible to use the two methods in quick succession or simultaneously. In the latter case, the X-ray image is received on photographic material sensitive to these rays but not to neutrons. This is backed by a layer that stops the X-rays but not the neutrons, which latter are photographed on a second film.

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