

min C. Two other B vitamins, inositol and para-aminobenzoic acid, were without effect but lack of vitamins A and D combined seemed to reduce the phagocytic activity.

A relation between diet, particularly its vitamin content, and resistance to infection has long been suspected. The Cincinnati investigators point out that past evidence shows this is not a matter of vitamin deficiency affecting directly the resistance given by another class of

the body's germ-fighters, the antibodies. These substances are more specific in their germ-fighting activity than the phagocytes and are responsible for the kind of disease resistance obtained from vaccines.

The discovery of reduced phagocyte activity resulting from vitamin deficiency may, the doctors suggested, give a valuable means for detecting slight degrees of vitamin starvation.

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ference in his performances at rest and during exercise.

The fact that he felt so much better is due, the scientists believe, to psychological effect. His actual disability has not been decreased materially, but the exaggeration of it by his worry has been overcome. The treatment will be continued not only because of this psychological help but, more important, because the treatment should keep his silicosis from getting worse.

This checking of the disease, in the opinion of Dr. Gardner and Dr. Wright, is the most important use for aluminum treatment.

"We feel certain that it will prevent the development of silicosis and even cause retrogression of incipient disease," they stated. "It has a real place in protecting persons like this man who face ultimate permanent disability whether they quit their jobs or continue to work where they are best qualified. His mine is under good industrial hygienic control but there is still some silica in the air. 'Susceptible' as he apparently is, added exposure may hasten his total incapacitation. Aluminum should neutralize any quartz that he inhales in the future and hold his disease at its present level."

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NUTRITION

Soldiers Need Vitamin C

► SOLDIERS preparing for battle or actually in combat need plenty of vitamin C to help them withstand the shock of any injuries they may receive, if results of laboratory studies on guinea pigs can be transferred to man, Dr. A. Wilbur Duryee, of New York Post-Graduate Medical School, Columbia University, reported at the meeting of the American Therapeutic Society.

Guinea pigs on a diet lacking vitamin C, the citrus fruit-tomato vitamin that prevents scurvy, succumbed more readily to shock from injury than animals getting plenty of the vitamin, he and his associates, Miss Ellen McDevitt and Dr. Bertrand E. Lowenstein, found.

Giving the animals doses of vitamin C immediately after injury did not pre-

vent their dying from shock, but those already getting plenty of vitamin C in their diet were helped by the extra vitamin dosage after the injury to survive four times as long, even though they eventually succumbed, as the vitamin-starved animals similarly treated.

Guinea pigs on diets furnishing plenty of vitamin C, the Columbia scientists also found, become considerably more resistant to injury when repeated every other day. Vitamin C-starved guinea pigs, on the other hand, cannot be conditioned to injury in that way.

Vitamin C, the scientists suggest as a result of their studies, might well be added to blood plasma at the time this is given to treat shock.

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ENGINEERING

Mirrors Make Industry Safer, Products More Perfect

► "IT'S DONE with mirrors," explains the latest electronic magic which promises to make many industrial jobs safer, products more efficiently inspected.

The new device, called a "wide-angle photo-electric scanner" by its inventor, E. B. McDowell of General Electric's electronic division, was demonstrated to science writers at a press conference on industrial electronics in Schenectady.

Advantages over present methods claimed for the scanner are: 1. simpler, 2. more compact, 3. more efficient. Here is how the laboratory model worked:

A four-sided area is lighted along two sides by ordinary light. On a third side whirls a four-faced pyramid of mirrors a few inches high. This picks up the light blanketing the area, and reflects it to an adjacent light-sensitive cell which is essentially an electronic emission tube.

Should an object as small as a man's finger enter the lighted area for even a two-hundredth of a second, the electronic eye will detect its fleeting shadow. Thus its application as an industrial safety

MEDICINE

Aluminum for Silicosis

Treatment, pioneered by Canadian scientists, helped keep a miner from having to stop working. His improvement is due largely to psychological effect.

► THE STORY of how aluminum treatment for silicosis, pioneered by Canadian scientists, helped to keep a shift boss in an American mine from having to quit work and lose his chances of promotion was told in a report by Dr. L. U. Gardner and Dr. George Wright, of the Saranac, N.Y., Laboratory at the meeting of the Industrial Hygiene Foundation in Pittsburgh.

This 35-year-old miner suffered from a progressive type of silicosis due, the scientists believe, to excessive exposure in early life. He also seemed to be one of those persons unusually prone to develop silicosis because of poor upper respiratory protection.

For over a year he was concerned over his shortness of breath. He could not, because of the distance, go to the field laboratory where other miners were inhaling metallic aluminum powder for silicosis, prescribed by the Porcupine Clinic in Canada, so he was given a small quantity of powdered alpha monohydrate of aluminum which he inhaled from a simple apparatus consisting of two bottles, an atomizer bulb and a valved mouthpiece.

This seemed to help him as much as the metallic aluminum powder was helping the other miners. Tests after 50 daily treatments, and again after about 50 more, however, showed no essential dif-

device. If the blanket of light were hung across a punch press, for example, a man's finger entering the danger zone would instantly activate the electronic shut-off switch for the machinery.

Used as an inspection device, the light could be reflected from speeding sheets of paper during manufacture; imperfections would be detected by the scanner since blotches on the paper would cause slight changes in light intensity. This untiring "eye" could similarly be adapted to other products requiring inspection of a large expanse.

Need for a more efficient automatic door opener mothered the new inven-

tion, which stems from the old idea of light scanning with mirrors.

Photoelectric methods now installed to open doors usually have several cells, instead of one, and use broad beams of light. When a truck with protruding pipes or lumber backs to the unloading door, the door may fail to open in time because only a small part of the beam is cut off by the thin projections.

This "maybe factor" is avoided by the new scanner since only a small segment of light registers at a time but the entire lighted area is checked in a fraction of a second.

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ENGINEERING

Most Electrical Ship

New battleship Iowa, largest of world's warcraft, can pour out 10,500 kilowatts of electrical energy from her generators, enough to supply a city.

► THE NEW battleship Iowa, hugest among the world's warships, also has the most elaborate electrical installation. Capt. H. G. Rickover, USN, sketched some of the high points of her equipment in an address before a meeting of the American Institute of Electrical Engineers in Roanoke, Va.

The generators aboard the Iowa can pour out a total of 10,500 kilowatts of electrical energy, which is enough to supply a city of 20,000 people. The huge ship carries 1,300,000 feet of electric cable, 900 motors, 5,300 lighting fixtures, 275 service telephones and 800 battle telephones.

Impressive though these figures are, they only serve as typical for the U. S. Navy in general. American ships are electrical ships, and have become increasingly so since the first World War. Then, Capt. Rickover pointed out, the over-all figure for generating capacity in the Navy as a whole was about one-twentieth of a kilowatt per ton of displacement; now it is approximately one-fourth of a kilowatt.

Some of the special problems involved in electrical installations on Navy ships were pointed out by the speaker:

"In addition to the characteristics normally required in electrical equipment for industrial use, it is necessary that certain special features be incorporated in the design for naval application. These special features include reliability, ruggedness, use of corrosion-proof materials, drip-proof and water-tight

features, ability to withstand the roll and pitch of vessels, and insulation and impregnation adequate to prevent failure due to the effects of moisture and salty sea water. It is highly important that disassembly, repairs, and re-assembly of the equipment be easily and quickly accomplished on the vessel with ordinary tools and readily obtainable parts.

"The vast shipbuilding program now in progress has introduced many problems requiring prompt action and solution to avoid delay in ship construction. In order to meet the tremendous demand for electrical equipment entire new plants have been constructed. One factory produces nothing but 6000 horsepower synchronous motors and one motor per day is completed in this plant. Another similar factory produces one 4600 kilowatt steam turbine condenser and generator per day. These generators supply the power for driving the 6000 horsepower motors."

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ENGINEERING

New Standards for Fiber Insulating Board Issued

► NEW FIBER insulating board standards have just been released by the National Bureau of Standards. They include classes of structural materials designated as building board, lath for plaster base, roof insulating board, interior board and sheathing. The publication is a revision of the 1935 standards.



GIANT OF THE SEAS—The massive 45,000-ton USS Iowa, mightiest man-o'-war ever launched, is shown in this official U. S. Navy photograph sliding down the ways of the New York Navy Yard.

The new standards cover minimum physical requirements and tests for thermal conductivity, transverse and tensile strength, linear expansion, deflection and water absorption. They cover also requirements for composition, construction and finish.

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CERAMICS

Glass-Mending Method Uses Refractory Paste

► BREAKING of a precious Venetian vase or Bohemian bottle is a domestic tragedy at any time, and much worse now that their sources are for the time completely cut off. This gives interest to a process for glass mending on which A. M. Landesman and Eugene Landesman of St. Louis have been granted patent No. 2,333,186. In mending a broken glass vessel, first the fragments are carefully set back in place, then the whole thing is embedded in a coating of refractory paste and placed in a small furnace. When the right temperature has been reached, a blowpipe raises the glass along the fracture lines to the melting-point, which causes the broken parts to fuse together.

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