

per cent., Dr. Howes indicated. Existing roads failed to keep abreast of this tremendous increase in the volume of traffic.

Now, however, a nation-wide survey of highways is under way which will look ten years ahead, forecast traffic needs of 1948 and plan roadways accordingly.

Right now, highway construction is going through a period of transition. The present period is characterized by less extension of roads and more reconstruction of out-moded earlier designs, Dr. Howes indicated.

Poor Maps Cause Waste

A large amount of the hundreds of millions of dollars that annually are spent for federal construction projects is wasted because the United States lacks adequate maps, said Dr. William Bowie, formerly chief of the division of geodesy, U. S. Coast and Geodetic Survey.

For only a fraction of the cost of the government's giant projects the whole area west of the Mississippi River could be accurately mapped in five years, Dr. Bowie indicated. Eleven million dollars would be the cost of this job. While the sum seems large it would be returned many times over, by the prevention of wasteful methods, due to poor maps.

While 48 per cent. of the nation is topographically mapped, only about 15 per cent. is adequately mapped. Most of the present maps are too old or on too small a scale to be useful in construction projects.

"Vast amounts of money are spent annually on the public works," said Dr. Bowie, "and yet they are carried on in most instances without a knowledge of the physical facts of the earth's surface, that can be shown on a modern topographic map. The waste involved is enormous and it is inexcusable."

Ancient Ways in China

China sticks to centuries-old methods of irrigation not because modern pumps and machinery are unappreciated, but because coolie labor, at 15 cents a day, still is cheaper.

This is the view of Oliver Julian Todd, American engineer who has spent years in China at the College of Chinese Studies, Peiping.

Mr. Todd, recently returned from the Orient, told the meeting that engineers would be amazed and perhaps disgusted with the antiquated methods of irrigation in China. But, he added:

"Where it can be shown that men can stand in a sump and bail up water in five gallon cans, passing it to a platform four feet up where other men can lift it another four feet, and can do this at a lower cost than can be secured by competing centrifugal pumps operated by gasoline or kerosene engines, there is no argument. The coolies win as they always have in years before."

"They must eat and must be considered wherever there is work to be accomplished if they can underbid a mule or a machine of modern make. This economic fact must be constantly kept in mind by the engineer who is trying to modernize irrigation practice in China. Man-power at 15 cents per day in such quantities as most parts of China can produce it, is a force to be reckoned with always."

Large dams, for irrigation purposes, are a rarity in China, Mr. Todd said, for two reasons. Their cost is large and China is ever poor. But, in addition, the rivers of China carry enormous quantities of silt and mud during the summer rainy seasons. Thus dams would quickly fill up and demand constant clearing to continue their usefulness.

Science News Letter, July 30, 1938

RADIO

Television In Color Covered by New Patent

A SYSTEM of producing television images in natural colors has been patented by Robert Harding, Jr., of White Plains, N. Y.

Operating on a combination of the basic principles of color photography and color printing and of television image transmission, the method relies on superposition of primary colored images to achieve the desired effect, according to the specifications accompanying Patent No. 2,109,773.

Color filters and suitable lenses break up the scene to be televised to produce one image for each of the basic colors. These images are then directed at a special scanning disc to be converted into electrical signals for radio transmission.

At the receiving end, the signals are converted into light signals in a similar manner, except that the process takes place in reverse. Separate primary color images are then combined to produce the colored image.

The patent has been assigned to the National Television Corporation of Wilmington, Del.

Mr. Harding's method differs from the Bell Telephone Company's color television system, demonstrated in 1929, in that the latter uses color filters placed before the photoelectric cells that turn light into electric current. In the latter three separate banks of light sensitive cells are required. In Mr. Harding's system, lenses and filters separate the colors even before scanning and a single set of photoelectric cells is used.

Color television has not received nearly the same attention as has black-and-white radiovision because of the necessity felt by radio engineers of solving the relatively simpler problem first. In addition, color television as worked out both by Mr. Harding and the Bell engineers requires the use of a mechanical scanning disc, no longer in general television use because of serious mechanical difficulties.

Science News Letter, July 30, 1938

MEDICINE

May Inherit Tendency To Rheumatic Disease

THE IDEA that rheumatic disease runs in families is pretty old, but it takes on new significance in the light of recent studies by a research team from the children's department of the Johns Hopkins Hospital, the Johns Hopkins School of Hygiene and Public Health and the U. S. Public Health Service.

The figures reported by this group, Drs. Frances E. M. Read, Antonio Ciocco and Helen B. Taussig, show such a strong family tendency to the disease that it suggests a constitutional susceptibility to the condition. If scientists, following this lead, can find definite characteristics of body build or reaction which are associated with rheumatic disease or can learn the order in which cases develop in a family, it might solve some of the unknowns about this disease and even perhaps point the way to control.

The rheumatic condition under discussion is not arthritis, which also used to be called rheumatism, but the kind which appears as St. Vitus' dance, rheumatic fever or rheumatic heart disease. The seriousness of the problem is apparent from the estimate that rheumatic heart disease alone kills between 25,000 and 30,000 persons every year, nearly all of whom are under 30 years of age.

Germ infection is considered by most scientists to be the cause of the condition, but cold climate, dietary lack and

poor living quarters have also been strongly implicated. The findings reported by Drs. Read, Ciocco and Tausig to the American Journal of Hygiene seem to throw some doubt on the environmental factors.

Rheumatic conditions were found much more often in brothers, sisters and parents of rheumatic patients than

in those of non-rheumatic children. But the significant thing is finding rheumatic fever almost three times as often among uncles and aunts of rheumatic patients, and almost eight times as often among their grandparents as among uncles, aunts and grandparents of non-rheumatic children.

Science News Letter, July 30, 1938

ENGINEERING

New Model Basin Will Test Uncle Sam's Future Fleet

Replacing One at Navy Yard Built in 1895, Three New Basins Will Test Every Type Ship in Miniature

See Front Cover

A LARGE part of the mighty new navy Uncle Sam is preparing to build—including the bottoms for the three 45,000-ton battleships just authorized by Congress—will be model-tested about one year hence at the world's finest model testing basin.

That's the way the David W. Taylor Experimental Model Basin, now going up, and down, at Carderock Naval Station, Md., can best be described.

Digging down into the solid rock that underlies the Navy's 106-acre tract of land near Cabin John and building on it a unique structure to house shops, laboratories and offices, a horde of building trades workers is busy today rushing the job, scheduled for completion in July, 1939. So well are they doing their work, however, that completion is expected three months ahead of schedule.

The cover illustration of this week's SCIENCE NEWS LETTER shows construction work in progress.

Today a beehive of construction activity—giant steam shovels digging down to provide the channel for the water basins, men pouring reinforced concrete for the buildings—it will be tomorrow's American headquarters for nautical experimenting.

Three great basins will provide the proving ground for an entire navy and merchant marine. Facilities will be available for testing every type of ship in miniature—from high-speed power torpedo boat to mighty "battlegon." These advance-of-construction tests, now limited by inadequate facilities, will make not only for saved dollars but for

important advances in marine engineering as well.

The entire unit, on which the government is spending in the neighborhood of \$3,000,000, will be ready in time for these essential tests on many of the ships to be built during the next five years in the naval expansion program.

In size it far outranks the lone testing basin at the disposal of the Navy—the one at the Washington Navy Yard, erected in 1895 when the largest ship was one-quarter the size of the largest ships today and when the Atlantic Blue Ribbon went to the recordholders whose crossing time was in the neighborhood of a week.

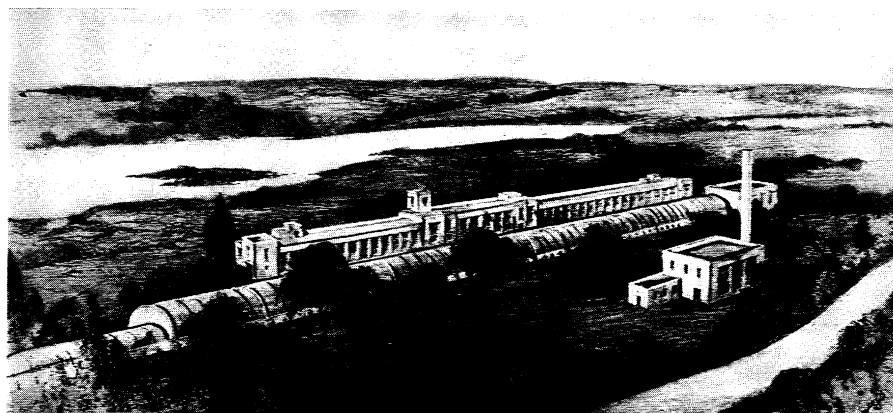
High-speed testing, even for the floats for Navy seaplanes, will be tried in a 1,050-foot high speed basin. Standard 20-foot model hulls will be towed or will move under their own power along a 700-foot basin, 20 feet deep so that there will be no wave "echo" from the side walls and bottom in order to approximate conditions found on the high seas. A shallow basin will also be available, connecting with a turning basin in which the maneuvering behavior of Navy bottoms can be checked.

The new naval test basin boasts of a set of office and laboratory units assembled in a radically new and effective fashion. Shops, laboratories and office-buildings will be linked into one 870-foot long structure running the length of the low-arched building covering the test basins sunk into Carderock's solid rock foundations.

The building is being assembled as a rigid frame structure, enabling the saving of material and dollars. Its outside surface consists of precast concrete panels designed to serve during construction as the outside form for pouring the thousands of cubic yards of concrete that provide the building's main shape.

Comments the Navy on this unique development, which has been used but little before and that little almost exclusively in Washington and vicinity:

"The construction of these panels involves considerable detail and technique which has heretofore all been done by hand labor. It is hoped that special equipment and processing will be developed on this proj- (Turn to Page 78)



HOW IT WILL LOOK

The David W. Taylor Model Testing Basin, shown here as it will be when completed in July, 1939, will be one of the finest model basins in the world. It will be equipped with three basins, machine shops, laboratories and other facilities. Many of the ships now contemplated as part of Uncle Sam's naval expansion program will be tried here in the form of models. The new basin will replace the test basin at the Washington Navy Yard, in use since 1895.