

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.

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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 "battlegwagon." 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.

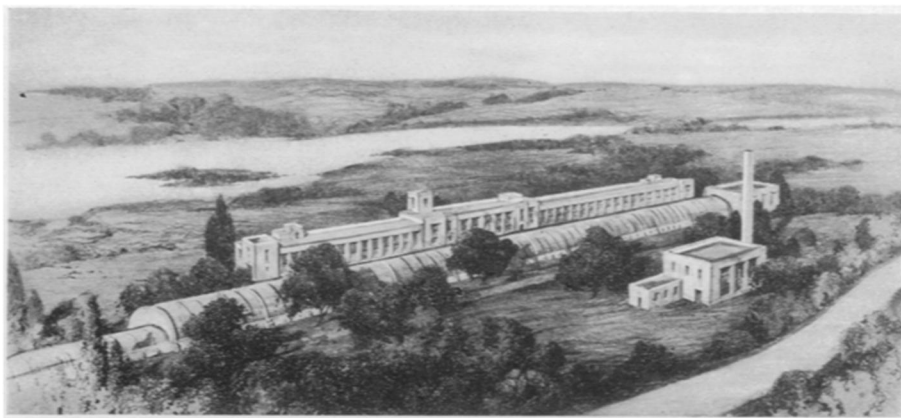
High-speed testing, even for the floats for Navy seaplanes, will be tried in a 1,050-foot high speed basin. Standard 20-foot model hulls will be towed or will move under their own power along a 700-foot basin, 20 feet deep so that there will be no wave "echo" from the side walls and bottom in order to 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.

ENGINEERING

St. Louis Cuts Smoke Density Over 11 Per Cent in Drive

Smoking Stacks Spotted From Watch Towers in Tall Buildings; Public Opinion Roused for Cooperation

THROUGH continual spotting of smokestacks in St. Louis, St. Louis has been able to reduce the density of smoke by over 11 per cent. from some sources, it was reported to the American Society of Mechanical Engineers meeting in that city.

Continual enforcement, plus a sustained and aroused public opinion to lessen smoke in the city, is the only way a community can free itself of air pollution, said R. R. Tucker, commissioner of smoke regulation of St. Louis.

Citing the lessons of 73 years of smoke troubles in St. Louis, Mr. Tucker said:

"As we glance over these records, we find they reek with ordinances. The fundamental fallacy in all smoke programs is that air can be purified by legislation. No administration or public officials can wave a wand and clear the skies. The public must come to a full realization of its responsibilities."

All coal and solid fuel dealers in St. Louis, Mr. Tucker indicated, are licensed and receive their permit only after they supply information as to the type of coal they are to sell, its origin and so on. Thus a check is made to see that coal with very high ash or sulphur content, or both, is not sold.

A corps of smoke inspectors also watches the blackest smoke stacks in

the city and reports on the smoke densities measured. Ten tall buildings in the city are the spotting towers for these smoke abatement inspectors. Observations last four hours each day with readings every minute.

Due to this surveillance there has been a marked reduction in St. Louis' smoke density, with the biggest improvement coming from the commercial group. Here an 11.65 per cent. decrease was reported. The smallest reduction was in institutional cases. Residential cases showed an average decrease of almost four per cent.

The final solution of St. Louis' smoke problem, Mr. Tucker indicated, can only come when an essentially smokeless fuel is provided for the large group of domestic consumers.

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From Page 71

ject to permit the construction of these panels on a production basis utilizing more mechanical equipment than has heretofore been possible."

Special three-hinged barrel arches, never used before anywhere, will span the basins and support their sheltering roof.

So exacting will be the work conducted in the new basin and its associated

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laboratories that artificial lighting will be used entirely, for artificial lighting is not subject to the variations of sunlight.

Not only that but the giant towing cranes, which will haul the models not equipped to travel under their own power, will run on rails curved with the curvature of the earth. The deflection is slight in the 1,050 feet of the high-speed tank; it is less in the shorter basins, but it is enough to throw delicate calculations out if due allowance isn't made in the construction of the rails themselves.

A force of 150 will man the new basin, around which is expected to grow a new community. Since model construction and testing is a highly specialized craft, most of the men will come from the testing basin at the Washington Navy Yard.

Number One man in the little wooden hut which serves as the headquarters of the officer in charge today is Lt. Comdr. Hugo Carl Fischer, Civil Engineering Corps of the U. S. Navy. But Lt. Comdr. Fischer, when you mention the subject of what naval officers are responsible for the development, reminds his listeners that Admirals William G. Du Bose and Emory S. Land, the latter now head of the Maritime Commission, were among those who had a hand in initiating the project. The work is being carried out under the supervision of Rear Admiral Ben Moreell, chief of the Bureau of Yards and Docks.

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CHEMISTRY

Tear Gas Used To Fight Weeds

BACK DURING the World War, tear gas was one of the weapons of military offense. Many a crucial objective was gained while its defenders were weeping, helplessly, like small boys.

Today, when strikes and riots pre-

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