ENGINEERING

Worm's-Eye and Angel's-Eye Views of New York in Exhibit

World's Largest Diorama, Showing 6,000 Buildings, Will Tell Story of Daily (and Nightly) Life in Metropolis

See Front Cover

VISITORS to New York during the 1939 World's Fair will have the unique privilege of getting a worm's-eye view and an angel's-eye view of the Big City's famous rush hour on one and the same day.

Out-of-towners unused to the mechanics of outwitting subway doors will have their revenge—an opportunity to look down and say, how puny this frenzy seems!

The world's largest diorama, a block-long, three-story-high reproduction of 4,000 buildings that contribute to the fabulous skyline, will show in 11 minutes life in New York around the clock. And its designers didn't forget the rush hour.

As 50,000 watts of power feeding "daylight" into the exhibit die out for the end of the day, the model will show New York motion in all its rush hour frenzy. Elevators in the buildings will rush up and down; trucks, buses and other vehicles will tear back and forth with greater facility than they do in real life; and subway trains will scurry underground, in cross-sectional tunnels clearly visible to the spectator. The sight will be soothing to the most outraged and trampled ego.

Complicated Wiring Job

Involving the most complicated job of electrical model wiring on record, the diorama is sponsored by the Consolidated Edison Company, New York's power merchants. It will be known as the "city of light." The 4,000 models of skyscrapers have 130,000 windows.

A model subway system, whose trains will travel the equivalent of one and a half times around the world during their meanderings in the diorama's bowels, will be a feature. Comprising 57 cars, the tiny trains will draw their power from a third rail and will have a block signal system similar to that used in actual subway operation. The cars are of cast aluminum.

The exhibit was designed by Walter Dorwin Teague. So detailed is it that even the jewelled lights of Coney Island will be shown in the Brooklyn corner of the diorama after nightfall.

During one brief interval in the cycle, seven small circular dioramas within the large one will come into view, showing various phases of city life, including a night baseball game, an operation at the Medical Center and a ballet in the Radio City Music Hall. During another interval, a display showing the tangled maze of electrical wiring, steam, gas and sewer piping that underlies the city will be lighted.

The model buildings are constructed of prefabricated composition slabs, superposed on wooden frames. A steel frame supports the entire structure.

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VOLCANOLOGY

Cooling of Rocks Cause of Volcanoes

MANY volcanoes erupt not so much because the molten rocks underneath the earth are still hot but because those rocks are cooling and in cooling they build up greater and greater steam pressures.

To a fireman tending a steam boiler, or to millions of good fathers who tend the family heating plants, this statement may seem puzzling. For they know that higher pressures are built up when a boiler becomes hotter. As it cools the steam pressure falls. And so it is in normal, everyday experience.

Volcanoes, fortunately, are not everyday occurrences on earth. Cooling does produce the great pressure increases which bring forth eruption. Huge quantities of steam liberated by volcanoes are just a way of relieving excessive pressure.

Studies at the Geophysical Laboratory of the Carnegie Institution of Washington have shown that the presence of water, contained in the molten rock, is the key to the seeming paradox.

This water frequently is held in solution by the silicates present. As the molten rock cools some of the silicate minerals are frozen out. The water is left behind but with smaller quantities of silicates present to hold it in solution.

Because of the relatively increased water content the steam pressure exerted by the dissolved water increases even though the rock mass may be cooling. Enormous pressures, built up in this way, are equalized in volcanic eruptions.

These studies, carried out by Dr. G. W. Morey and his co-workers and by Dr. Roy W. Goranson of the Geophysical Laboratory, involve the behavior of water in silicate melts under extreme high pressure in conditions which rival those found far beneath the surface of the earth.

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ENGINEERING

Air-Conditioning Attacks Self-Created Problems

WITH AIR conditioning coming into widespread use in larger, public buildings, the heating and ventilating engineers, who have made this advance in human comfort possible, are now faced with some serious problems which they have thus created.

As one example, what health risks are there involved in the recirculation of cool air through a crowded motion picture theatre, restaurant, or office building? It is hardly economical to use the cooled air only once and take in completely fresh air at each cycle in the air flow. Thus only a fractional part of fresh air is taken in.

Since this situation exists, the question arises whether the bacterial content of the air in an air-conditioned building gradually rises. If it does, does it approach a bacterial concentration which is potentially menacing to health?

In hospitals, too, there is the problem of what to do about the ventilation of contagious disease wards from which the air passes into a common system and, potentially, may be recirculated through the whole air-conditioned hospital.

More widely known among laymen is the problem of ridding restaurants and railroad cars of the odor of smoke. Here the problem is complex because it not only involves the cleaning of the air and its recirculation but the removal of elusive odor also.

The research committee of the American Society of Heating and Ventilating Engineers is considering these and other problems. These engineers are formulating experimental projects which will seek the best solution.

The task, they well realize, will be slow, for the problems involve medicine, biology, chemistry and physics as well as engineering.

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