

ENGINEERING

"Jack Up" Mexico City

Engineers will try to keep Mexican capital from sinking by pumping water back into subsoil. Difficulties of constructing large new buildings solved by "floating foundations."

► IN AN effort to "jack up" Mexico City, which has been sinking at an increasing rate—a foot a year since 1948—experiments have been started to pump water back into the subsoil by means of "rehydration wells."

The Hydrologic Commission of the Valley of Mexico has been studying ways to solve the two major problems: water supply for the city of almost 3,000,000 people, and the sinking of the ground level which is being accelerated as more water is being pumped out to supply more people.

The sinking that has lowered certain sections of the city 20 feet since 1900 is due to the fact that the clay subsoil of the Valley of Mexico is highly compressible, in certain zones being composed of 85% water and 15% solid material. Comparatively, for example, the subsoil of Boston is composed of 40% to 50% water and 60% to 50% of solid material.

Mexican hydraulic engineers call this situation "depression," or a lack of pressure. They plan to restore the equilibrium by means of newly-installed rehydration wells, pumping the overflow rain water during the rainy season, from June to September, down into the subsoil.

This will have the further effect of solving one of the city's major problems, flooding of the lowest areas during heavy rainfalls. Last year, after prolonged rainfall, many downtown streets were like canals and were negotiable only by small boats. The water overflowed onto the sidewalks and into stores, causing hundreds of thousands of pesos of damage in ruined merchandise, to say nothing of complete disruption of transportation in those areas.

Sometimes the modern inhabitants feel that the Aztecs might have picked a better location for their capital city than situating it in the middle of a lake. Indian engineers struggled with the problem before the Spaniards' arrival, and constructed dikes and canals to keep the waters under control. Their histories record at least three major inundations before Cortes conquered their empire. In the period from 1517 to 1900, 13 major floodings are recorded, some so great that inhabitants moved out and up into higher levels and waited for the waters to subside.

One of the most striking aspects of the sinking problem in the past has been the difficulties in construction of large buildings in the Mexican capital. With expert help from engineers from all over the world, modern Mexican buildings are now erected on "floating foundations" that allow the buildings to adapt themselves to the fall of the ground level, and in the last ten years,

for the first time, the sky line is being marked with buildings over 15 stories high.

Of course, the "sinking city" has its romantic note. As the rest of the city sinks in varying degrees, the Monument to Independence—a golden angel atop a high marble column—has been rising. And no one asks or wants to know the "scientific" explanation for this comforting phenomenon.

Science News Letter, May 23, 1953

PSYCHIATRY

Fearing Insomnia May Cause It

► FEAR OF not being able to sleep is one of the commonest causes of sleeplessness, or insomnia, says Dr. Gudmund Magnussen, Danish psychiatrist.

In a report to the National Association for Mental Health in New York, he states: "Sleeplessness may develop from some adventitious cause, which in itself results in one or two sleepless nights, but these appear to the person to be so dreadful, that he looks to the coming nights with the greatest concern and anxiety."

The fear dispels any possibility of sleep, and a chain reaction of sleeplessness is set up night after night.

In general, Dr. Magnussen states, any intense emotional experience, whether it be a pleasurable emotion like joy, or a depressing emotion like grief or worry, is apt to result in sleeplessness. This is because emotions set off brain reactions which interfere with the functioning of the sleep center located in that part of the brain known as the hypothalamus.

Quiet, darkness, absence of physical illness and pain are external conditions needed for good sleep. In addition, certain internal conditions are necessary, the most important of which is absence of emotional disturbance.

In some persons, such disturbance may be so severe that they need psychiatric treatment. In others, simpler remedies will help. Dr. Magnussen prefers, if drugs are used, to give sedatives which quiet the emotionally upset state, rather than hypnotics which bring on sleep without necessarily quieting the emotions.

Simple home remedies, such as a light, late supper but not a heavy one, just before bedtime, or a glass of beer or wine before bedtime help many insomnia sufferers. Practicing a simple ceremonial every night before going to bed is a method that is helpful to many.

Science News Letter, May 23, 1953

• RADIO

Saturday, May 30, 1953, 3:15-3:30 p.m. EDT
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Prof. Joseph D. Danforth, chemist, Prof. Grant O. Gale, physicist, Prof. G. Mendoza, biologist, Prof. Henry Weston, biologist, and President Samuel N. Stevens, all of Grinnell College, Grinnell, Iowa, discuss "Research in a Small College."

ELECTRONICS

Ingot Process May Cut Transistor Cost

► INGOTS OF precious germanium have been successfully produced by a method that promises to revolutionize the manufacture of transistors.

Transistors are rugged pea-sized chunks of germanium that can perform many jobs now done by vacuum tubes. They can be used in radios, television sets, hearing aids and giant electronic "brains." They are valuable because they conserve space and electric power, because they are rugged and because they last longer than vacuum tubes under the proper conditions.

As many as 100 wafer-thin layers of specially treated germanium can be produced in a six-inch ingot by the method developed by Dr. Robert N. Hall of the General Electric Research Laboratory, Schenectady, N. Y. Only one or two layers can be produced by other methods.

Still in a "laboratory stage," the method turns out germanium layers mixed with a trace of gallium. These layers are separated by thicker regions of germanium containing antimony.

One section of the "gallium-doped" layer in each transistor does the work of the grid in a vacuum tube, Dr. Hall explained. The "antimony-doped" layers take the place of the cathode and plate in a tube.

This "mass" transistor production is expected to cut transistor cost. At present the revolutionary electronic devices cost more than vacuum tubes.

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