

plied, with the practical results coming this year on a considerable scale.

Most of the rubber companies contributed to the development. The first pilot plant production of low temperature polymers was made by Phillips Petroleum Company in the late spring of 1946, while shortly after the middle of 1946 Goodyear produced a ton for experimental use. The U. S. Rubber Company made the first plant scale run of low temperature rubber experimentally in the summer of 1947, while the Copolymer Corporation at Baton

Rouge, La., after pilot plant operation the same year, converted half of its 30,000 ton capacity to 41 degree rubber early this year.

Plants now being converted to cold rubber production are: Copolymer Corp., at Baton Rouge, La., U. S. Rubber Co. at Naugatuck, Conn. and Borger, Tex., Goodyear Synthetic Corp. at Houston, Tex., and Los Angeles, Calif., Firestone Tire and Rubber Co., at Lake Charles, La., B. F. Goodrich at Port Neches, Tex., General Tire and Rubber Co., at Baytown, Tex.

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#### ASTRONOMY

## Palomar Giant Incomplete

► THE 200-INCH telescope atop Palomar Mountain is about to begin to probe the universe.

Nothing but test pictures have been taken to date with this giant telescope, dedicated six months ago (June 3).

When completed, the telescope will penetrate twice as far into space as previously possible. It will make available eight times the volume of space astronomers now have at their disposal.

But testing and adjusting is a time-consuming job, reports Dr. Ira S. Bowen, director of both Mount Wilson and Palomar Observatories. Progress is "good," and no slower than anticipated.

Latest estimates indicate that the Hale telescope, to be operated jointly by California Institute of Technology and Mount Wilson Observatory of the Carnegie Institution of Washington, will actually go into operation late next spring.

Latest score on the world's largest telescope shows:

Final adjustments must be made on the 200-inch mirror.

Two of the telescope's seven mirrors have yet to be finished, installed and adjusted.

Coude spectrograph is still incomplete.

Ross correcting lens remains to be installed at the telescope's prime focus.

The telescope is a reflector, not a refractor. Thus it is made of mirrors rather than lenses. The 200-inch mirror, of course, is the largest of these. It weighs 14 3/4 tons.

Minor modifications were made on the support system for the telescope this summer, and new adjustments are now being completed. More tests are being run to check the mirror.

Three respects in which this telescope will surpass all other telescopes are:

Dispersion, of importance in the study of the relative abundance of elements in the universe.

Resolving power, of value in deciding whether there are canals on the planet Mars, thus indicating whether or not intelligent beings exist there.

Space penetration, helpful in deciding whether the universe is expanding, as many astronomers believe.

When finally completed, the telescope will catch on photographic plates light that started its journey to the earth a billion years ago.

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be constructed near shore in three sections with bulkheads, and floated to position. Giant cranes would lower them to the prepared bed of sand, where the sections would be joined together.

Geological studies of the channel mud bed have already been made under the direction of the supervising geologist, Parker D. Trask, of the San Francisco Bay Toll Crossings. He states that the depth of mud to be removed runs up to 50 feet. Suitable sand for replacement has been located about five miles away.

The sloping tubes on both ends would be supported and protected by sand islands extending well above the high-water line. The islands themselves would be protected from current and wave action by heavy riprap. This combination scheme leaves a clear unobstructed channel for shipping. A tube for the entire crossing distance is economically impracticable.

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#### AGRICULTURE

## "Turkish" Tobaccos Now Grown in United States

► THE UNITED STATES may soon be able to declare independence again—this time from Turkey. Turkish-type tobaccos, noted for their high aroma volume, are necessary ingredients of all quality cigarettes.

Spurred by wartime shortages, plant scientists at Duke University under the leadership of Dr. Frederick R. Darkis have successfully grown high-aroma tobaccos in cooperation with the agricultural experiment stations of Virginia and the two Carolinas. The new American "Turkish" tobaccos are also low in nicotine.

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#### METEOROLOGY

## Sun and Moon Cause Tides in Atmosphere

► UNOBSERVED by human senses, two daily tides sweep through the ocean of air at the bottom of which we live. Their existence and causes were discussed by a noted Norwegian meteorologist, Dr. J. Bjerknes of the Geophysical Institute of Bergen, before the meeting of the National Academy of Sciences in Berkeley, Calif.

One of the tides is a response to the pull of the moon, the other to that of the sun, with the solar air tide much the higher. Its crests come at 10 a.m. and 10 p.m. at sea level; but there is a "tilt" in their height, Dr. Bjerknes stated, so that on a mountain 17,000 feet high the crests come at noon and midnight. He presented results of calculations tending to show that the amplitude of the solar air tide is strengthened by the heating effect of the sun.

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#### ENGINEERING

## Trestle-Tube Proposed

► A UNIQUE combination of bridge, earth-fill and subway tube across San Francisco Bay, to handle increasing highway traffic now beginning to overtax the San Francisco-Oakland Bay Bridge, is suggested in an official report to the State of California.

The tube, considerably over a mile in length, would extend from the end of a bridge on one side to an extended earth-fill on the other, dipping between into the floor of the bay. It is one of two plans recommended in the report by Ralph A. Tudor, chief engineer of the California Division of San Francisco Bay Toll Crossings. The other is a twin bridge parallel to the present structure.

The trestle-tube combination presents difficult engineering and geological problems which both engineers and geologists believe can be solved. The soft mud at the bottom of the channel is one of the principal of these. The proposed solution is to dredge it out to a hard base, and to put in its place a foundation of sand.

The total crossing would be some six and one-half miles in length. The trestle bridge would be about one mile long. The proposed tube would be approximately 6,000 feet in length, and an earth-fill would occupy the rest of the crossing length. Three parallel tubes are proposed. Each would be 37 feet in diameter and constructed of reinforced concrete. They would