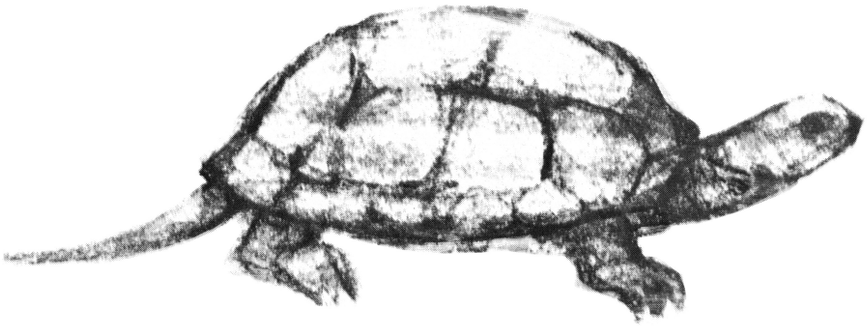
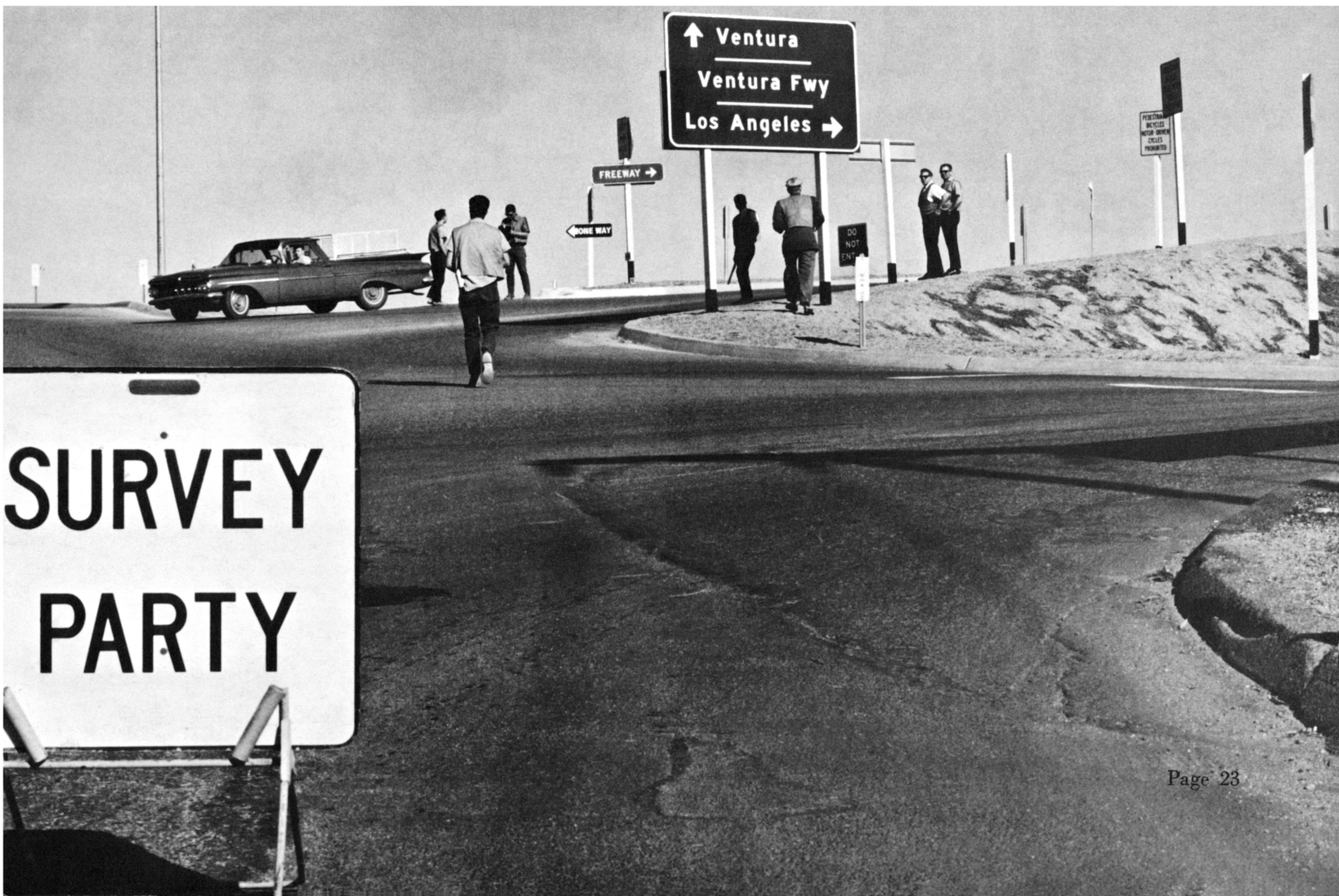


THE TORTOISE STEPS OF SATURN S-II

PATIENT LAND AND SEA JOURNEYS PRECEDE FLIGHTS OF S&ID SECOND STAGE MOON BOOSTER

Challenging problem of moving large rocket segments before launch is demonstrated by Space and Information Systems Division's Saturn S-II common-bulkhead test tank on high road to Santa Susana test facility.

Long before the actual transport of the tank test unit, surveyors viewed every foot of the route, determining feasibility of passage. Of special concern to surveyors were both the on and off ramps of the Ventura Fwy.



Slow Earth journeys at 10 mph are part of the preparation for Saturn S-II, second stage of NASA's Saturn/Apollo moon rocket.

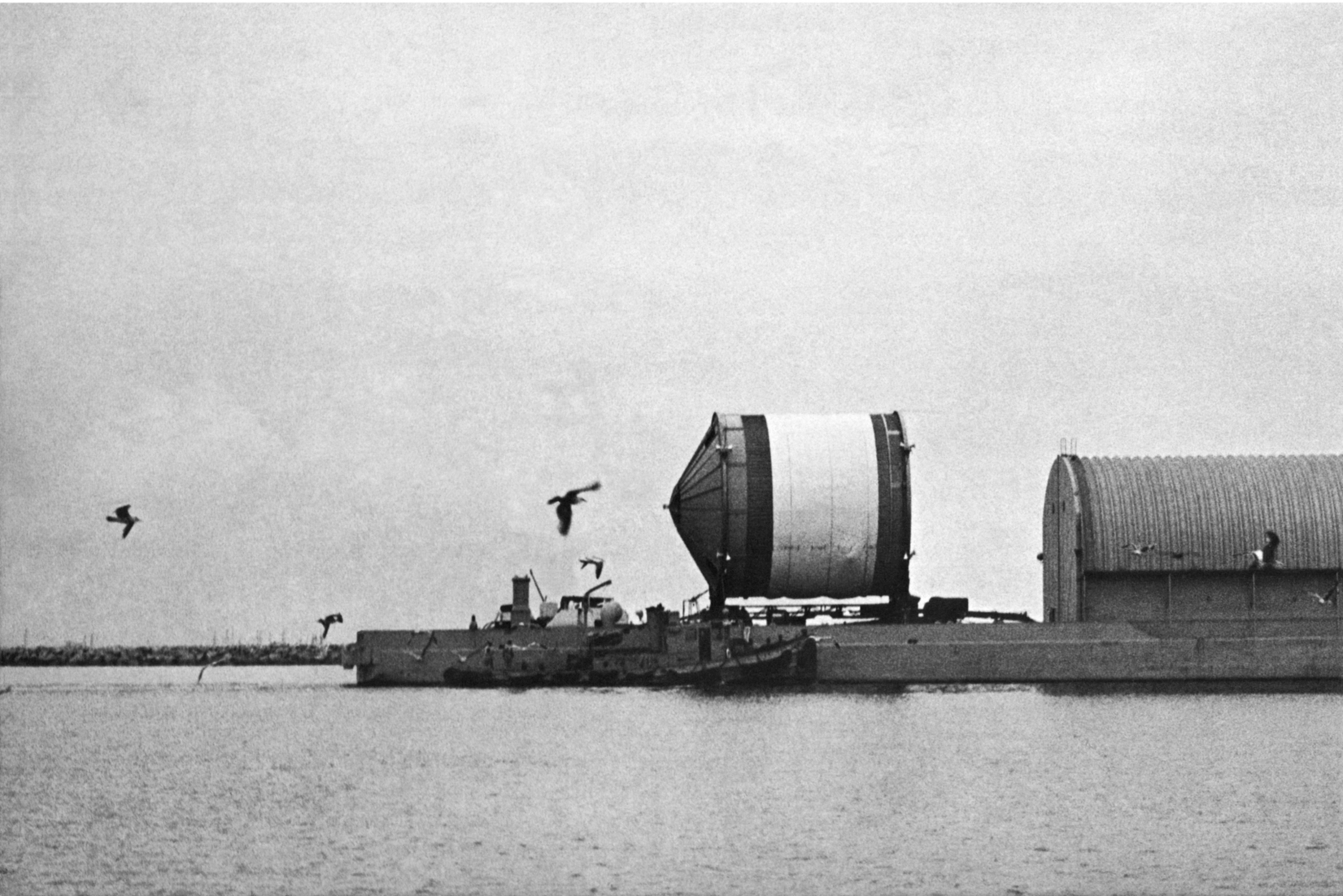
North American's Space and Information Systems Division is building the S-II at its Seal Beach, Calif., facility, one and one-half miles from the open sea.

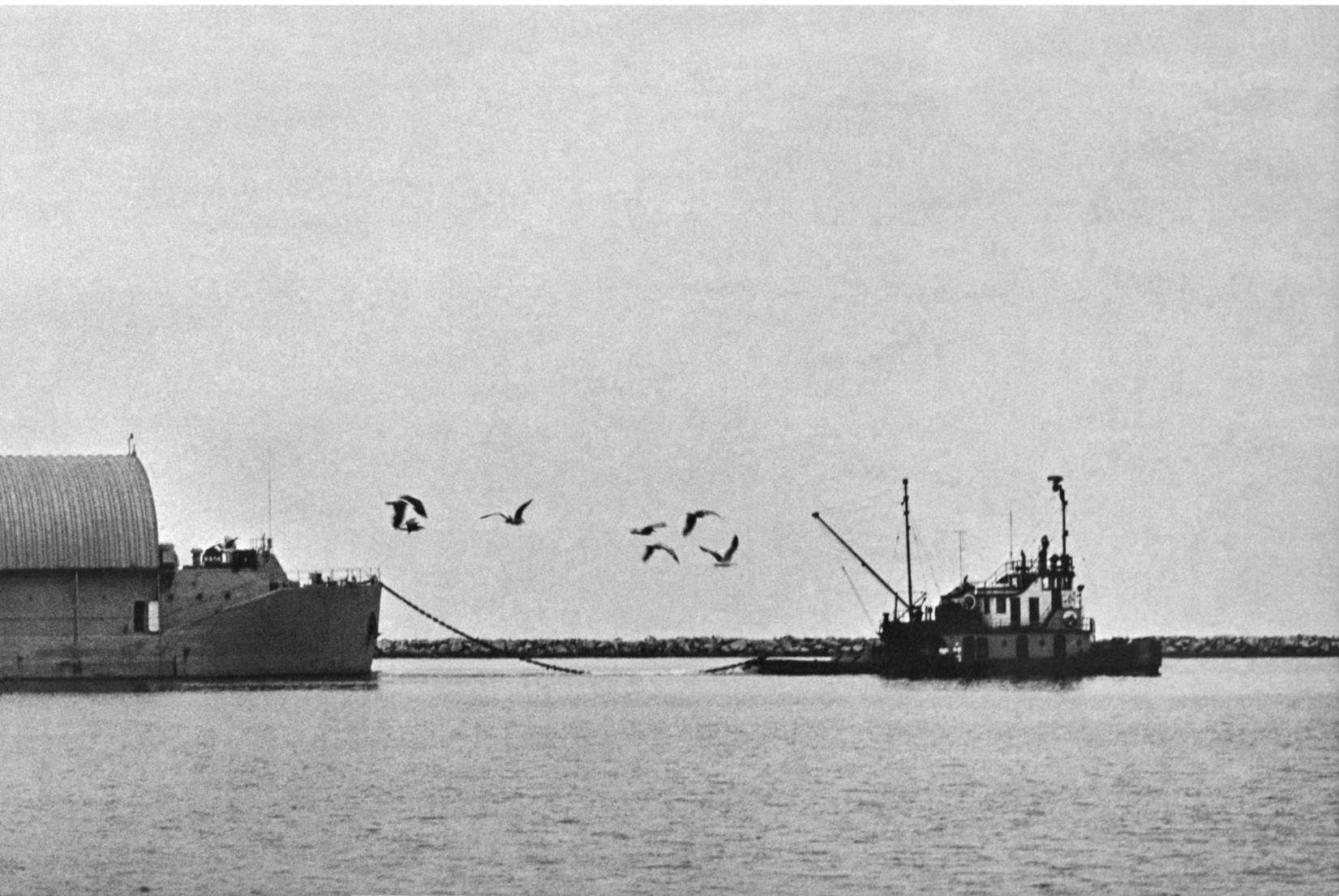
The waters of the Pacific and the Atlantic are the primary highways in the movement of the completed vehicles down to the Panama Canal, up to the Gulf of Mexico, and into the NASA Mississippi Test Facility for the final acceptance testing, and the last water journey over to Cape Kennedy.

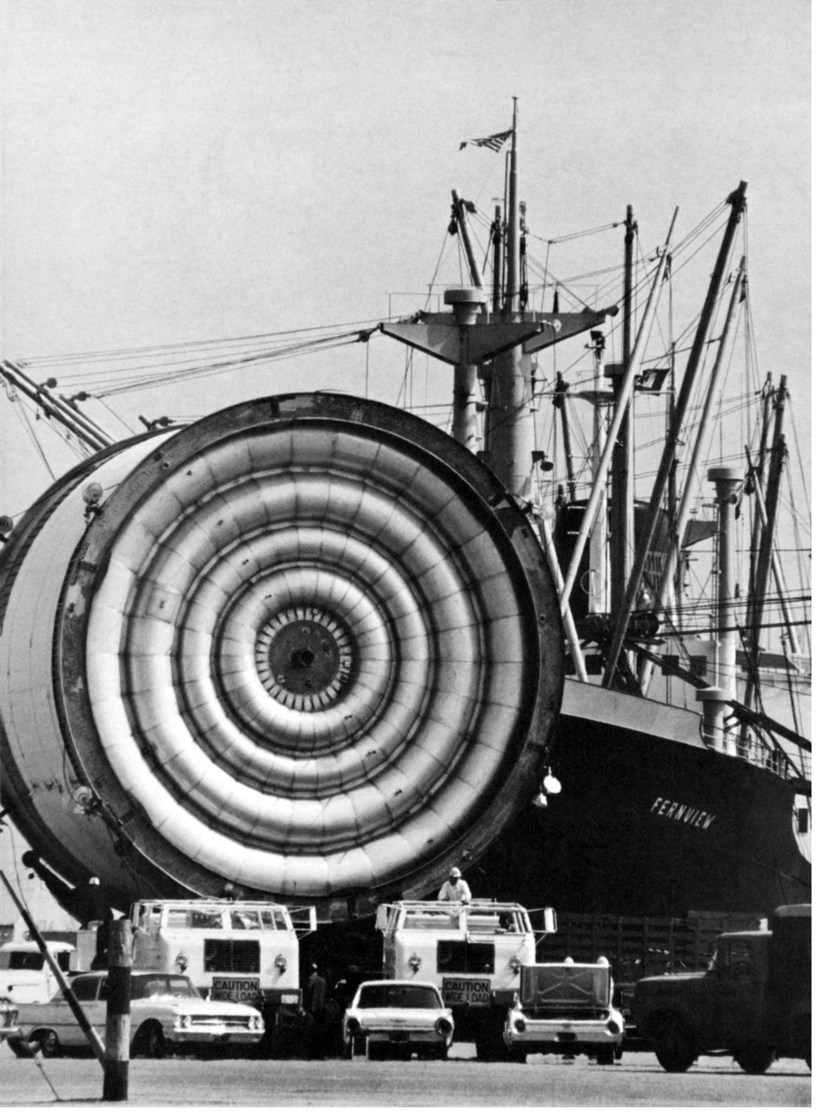
There was another journey, shorter, but more demanding in patience from the Space Division transportation specialists. It concerned the movement of a test vehicle that journeyed by water from Seal Beach 60 miles northward to Port Hueneme, then over 50 miles of Ventura County roads and California freeways into Rocketdyne's mountain testing site, the Santa Susana Field Laboratory.

Second step in preparation was dispatch of empty transporter over the route from Port Hueneme to Santa Susana. Guide line for difficult turns was spray-painted on roadway. A driver was at each wheel of the 120-foot-long, custom-built transporter.

Tranquil portion of journey was 60-mile sea voyage from Seal Beach to Hueneme. Eight-hour trip was made aboard homely YFNB-29 barge supplied by NASA.



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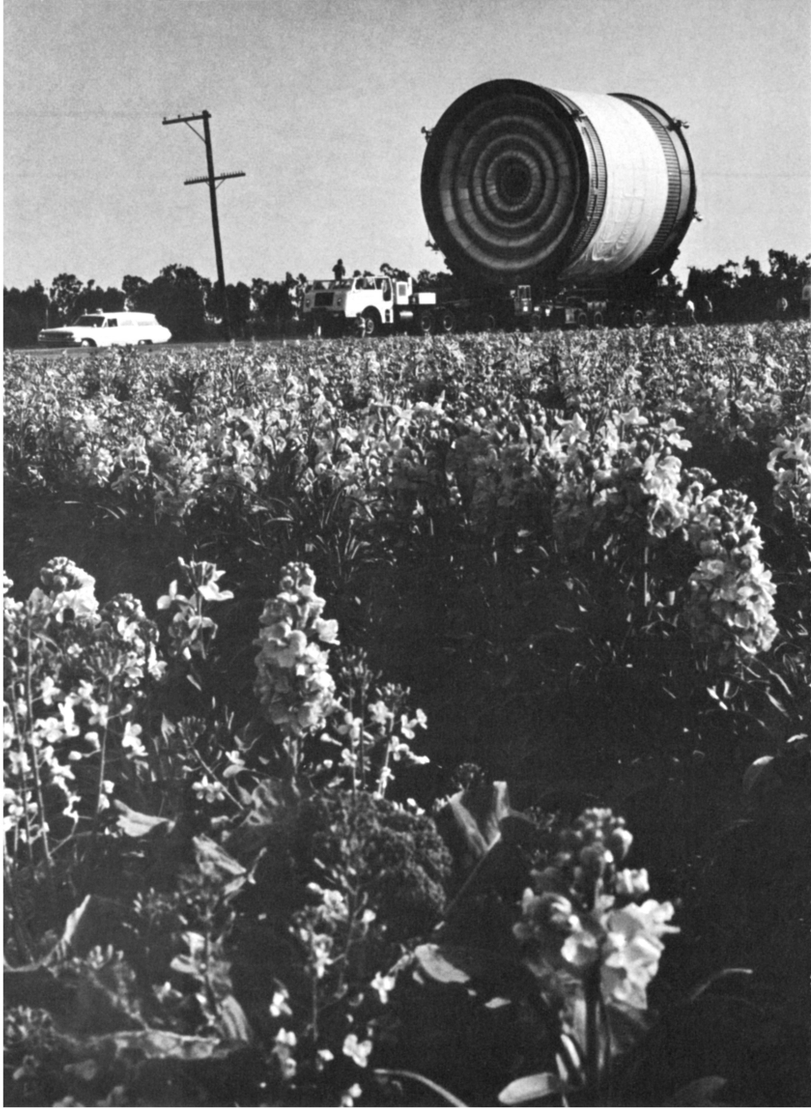

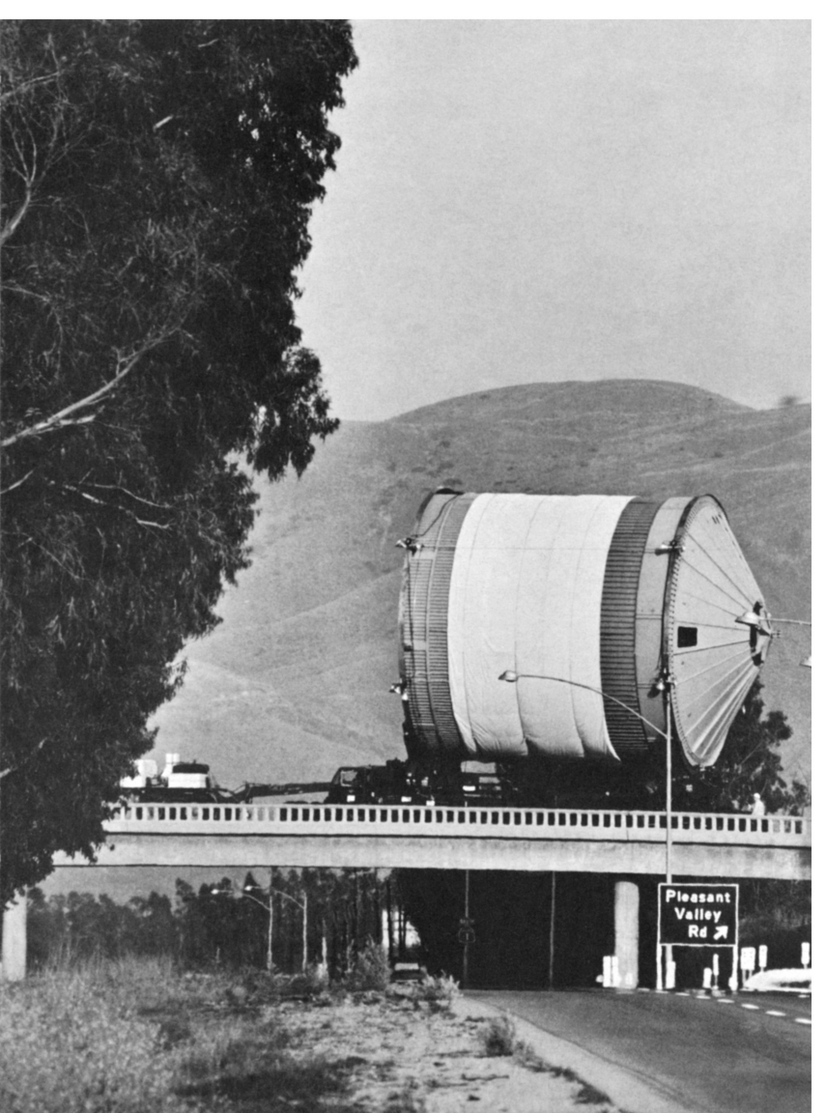
Pleasant
Valley
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Top left, the common bulkhead test tank is 47 feet long, 33 feet in diameter. The complete Saturn S-II, being built by Space Division for NASA is 81½ feet long. Four concentric rings in base are specially installed for pressure test data.

Top right, some of the land journey was past flat, cultivated fields, but this was an exception. Close cooperation was necessary with utility, telephone companies, highway departments in order to prepare roads, temporarily remove overhead lines.

Bottom left, lack of clearance under freeway bridges forced complicated maneuvers at 14 different points. Movement was made in off-hours to give least inconvenience on heavily traveled freeway.

Bottom right, convoy starts up hill to canyons of Santa Susana Field Laboratory.

Below, arrival at test site in Santa Susana Field Lab. Six-phase test series will certify structural integrity of common bulkhead when subjected to critical design loads, high, low temperatures.

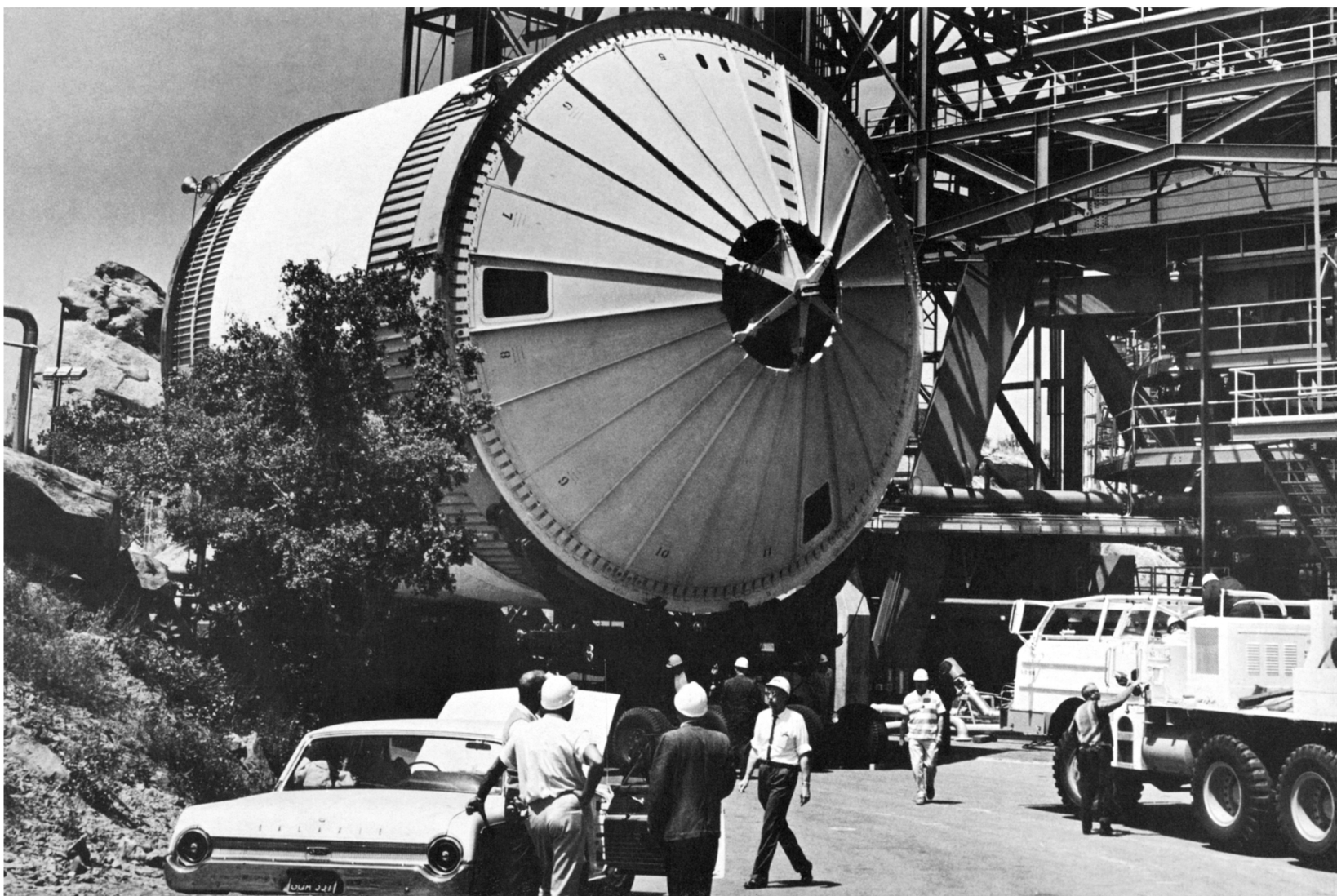
The hydrogen-fueled S-II will be 81½ feet high and 33 feet in diameter. But when it is placed on its side for the journey and rested on a specially-built transporter, the over-all length becomes 120 feet, the height 43 feet, and the gross weight 200,000 pounds, the largest, heaviest load ever to move across California highways.

Careful Preparation

Careful preparation has gone into the projected moves. Dry runs with the transporter alone have been made; runs with skeleton fixtures, and, just recently, as shown in the accompanying photos, a journey by a common-bulkhead test tank.

The tank is a replica of the critical inner part of the S-II where the liquid hydrogen and the liquid oxygen tanks share a common wall. Tests on the fixture at Santa Susana will certify structural integrity of the design.

Each slow jaunt is an important tortoise step to the final journey, the leap for the moon.



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