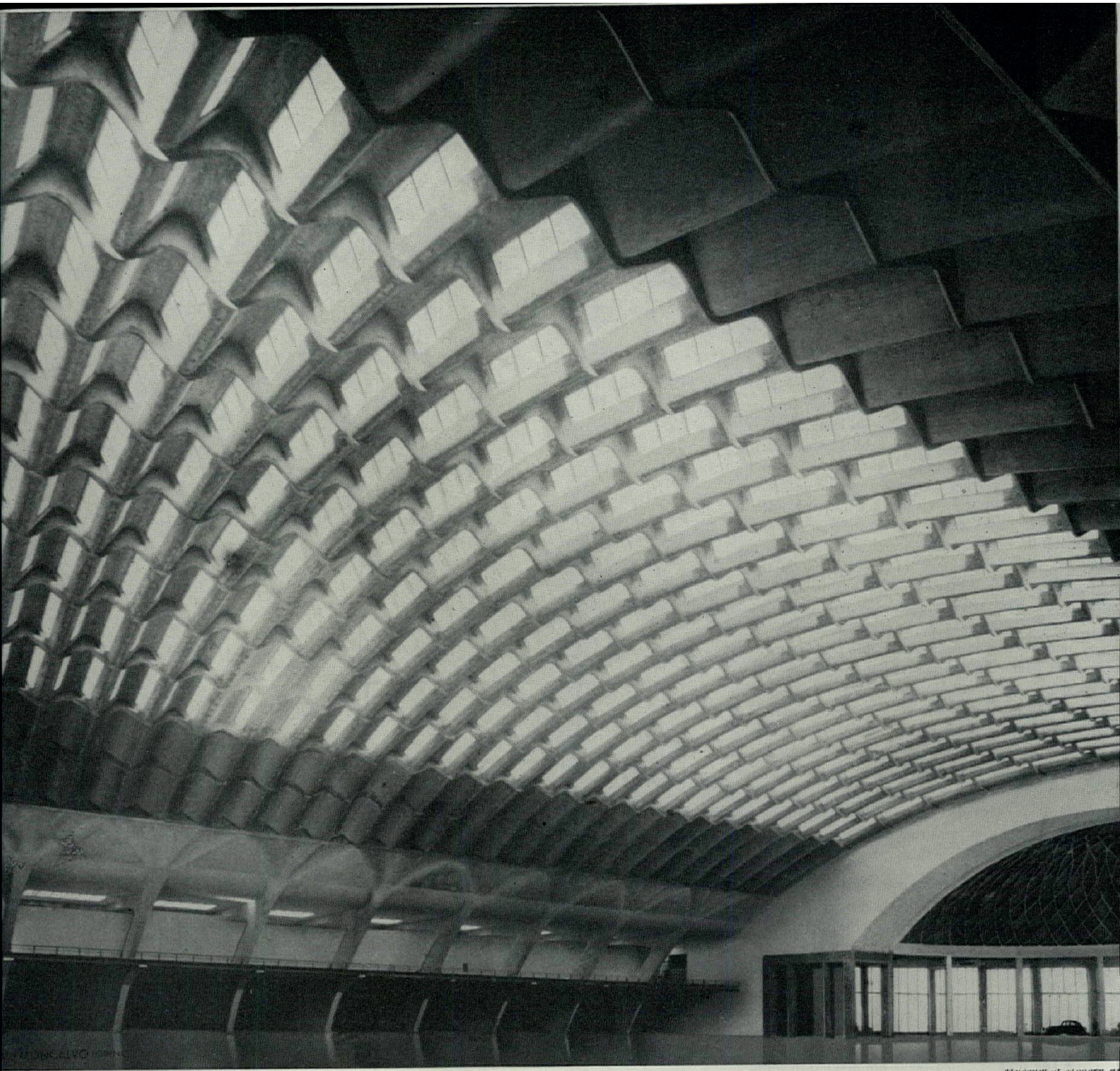

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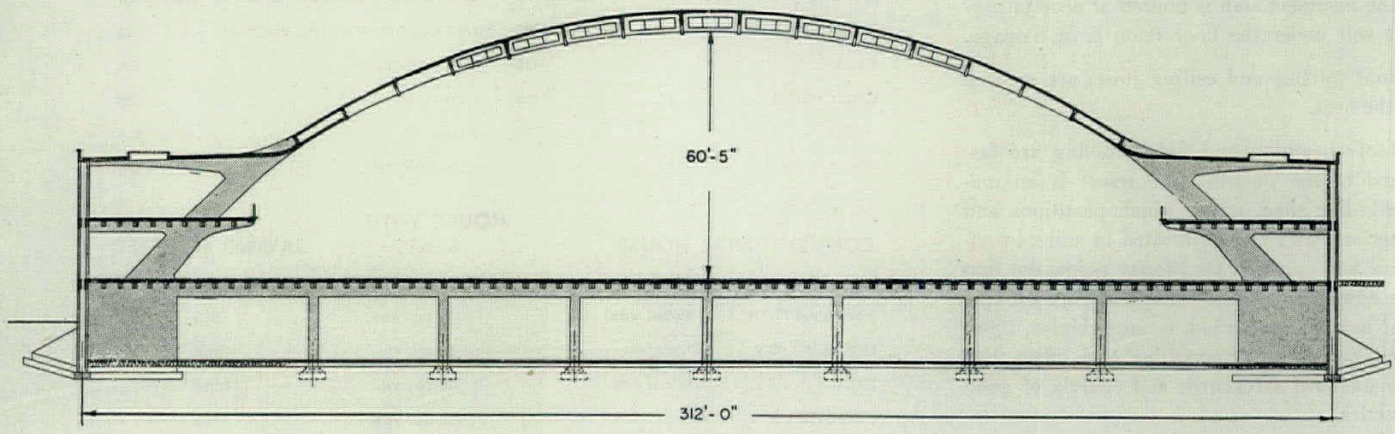
That's a full-size automobile, not a model



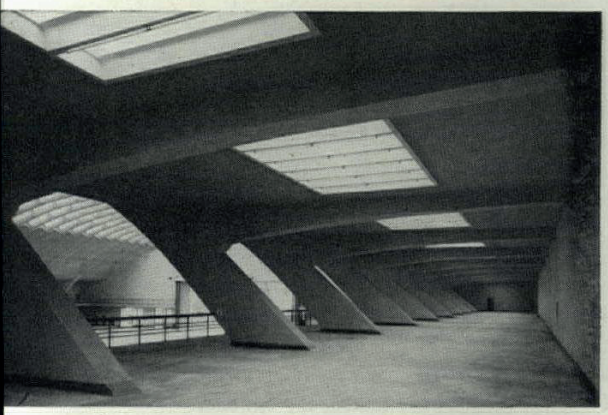
PIER LUIGI NERVI'S

EXHIBITION HALL

IN TURIN, ITALY

The compressive splendor of concrete is expressed by a great engineer

Photos:



Stresses from this tremendous roof (width, 312′; length, 250′; weight, seemingly nothing) fan down into the stems which also support a gallery (above). These stems collect and transmit the thrust to the masses of concrete below grade.

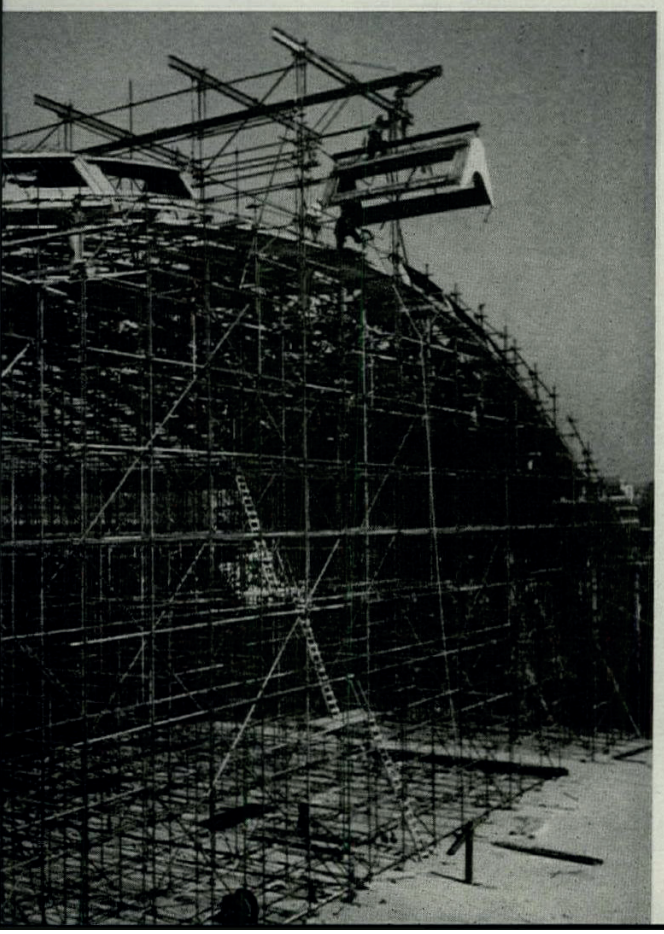
The exhibition hall in Turin shows how precast concrete and poured-in-place concrete can be used together, without losing the advantages of either. It also shows that great engineering is fluent architecture.

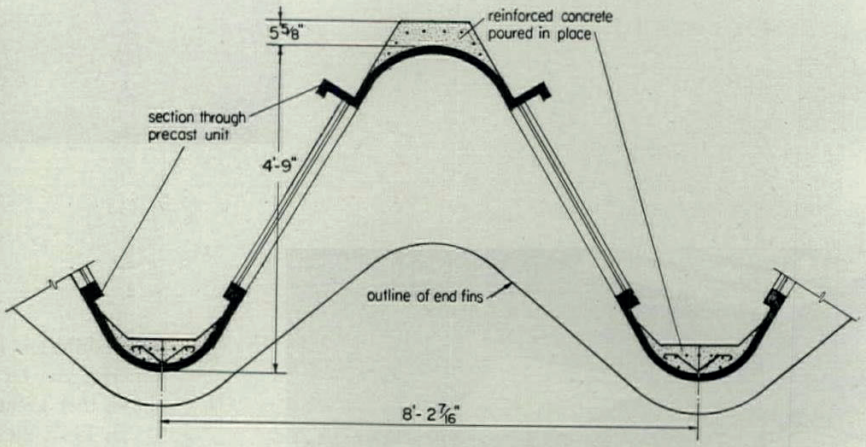
In 1947, the engineering firm, Nervi & Bartoli, was asked by the Italian government to solve the construction of a building already generally laid out, to replace a bomb-damaged exposition hall. They were asked to design a great roof which would admit light and be economical and *fast* to build. A second problem was to design a smaller rotunda at one end, 132′ in diameter, facing the Po.

The engineers turned to a solution they had previously used in less imposing structures—a corrugated barrel vault. The foundations, up through the slender abutments and the fans above them, were poured in place. But the roof of the vault was made of sizable prefabricated sections, cast carefully around their reinforcing in molds on the ground, then hoisted up into place. The precision possible in this method of pouring gave a light, windowed roof which could not have been formed up in the air. And the pattern, which gives the building scale and excitement, has a structural purpose in every curve. To see this, turn the page.

Photos: Moncalv

The prefabricated sections are 8' 2" wide, 5' 4" high, and each weighs 1½ tons

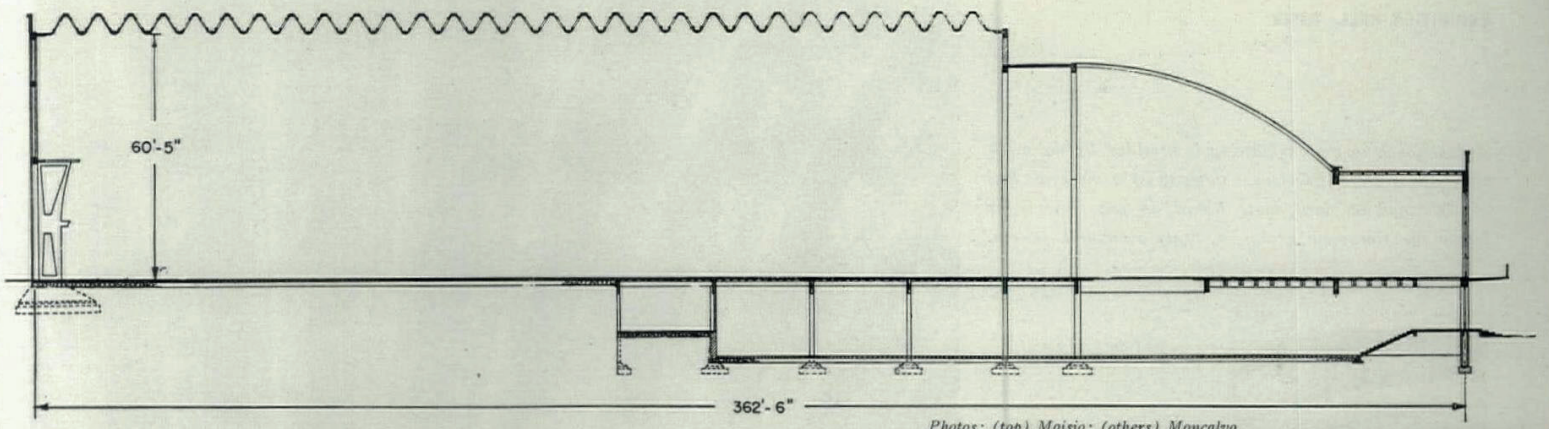




The prefabricated bones of the vault are shown on this page in place, in transverse section, and in transit.

Each one is made of a thin shell of concrete which is curved (and usually pierced by two big windows) and held in shape by a thicker stiffener cast integrally at each end. When the sections are mated, the stiffeners form the sensuous curves which undulate over the hall.

The expense of fabricating and handling these members was more than paid for by the great saving in steel and concrete resulting from the use of the strong corrugated shape. These shapes were molded successively



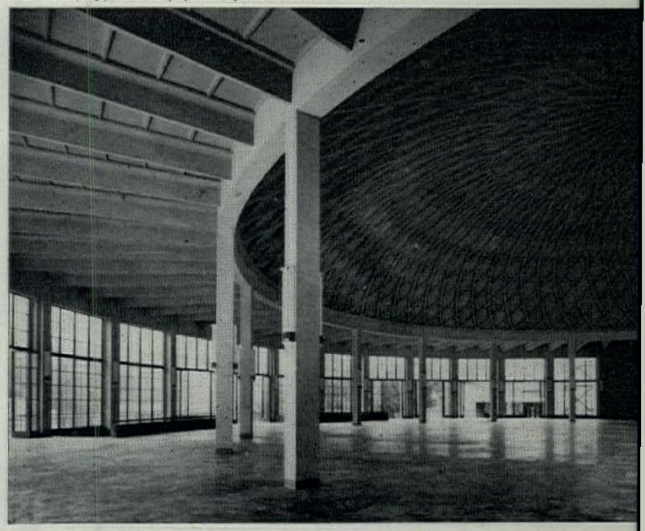
Photos: (top) Moisio; (others) Moncalvo

on forms which could be taken apart, then re-used.

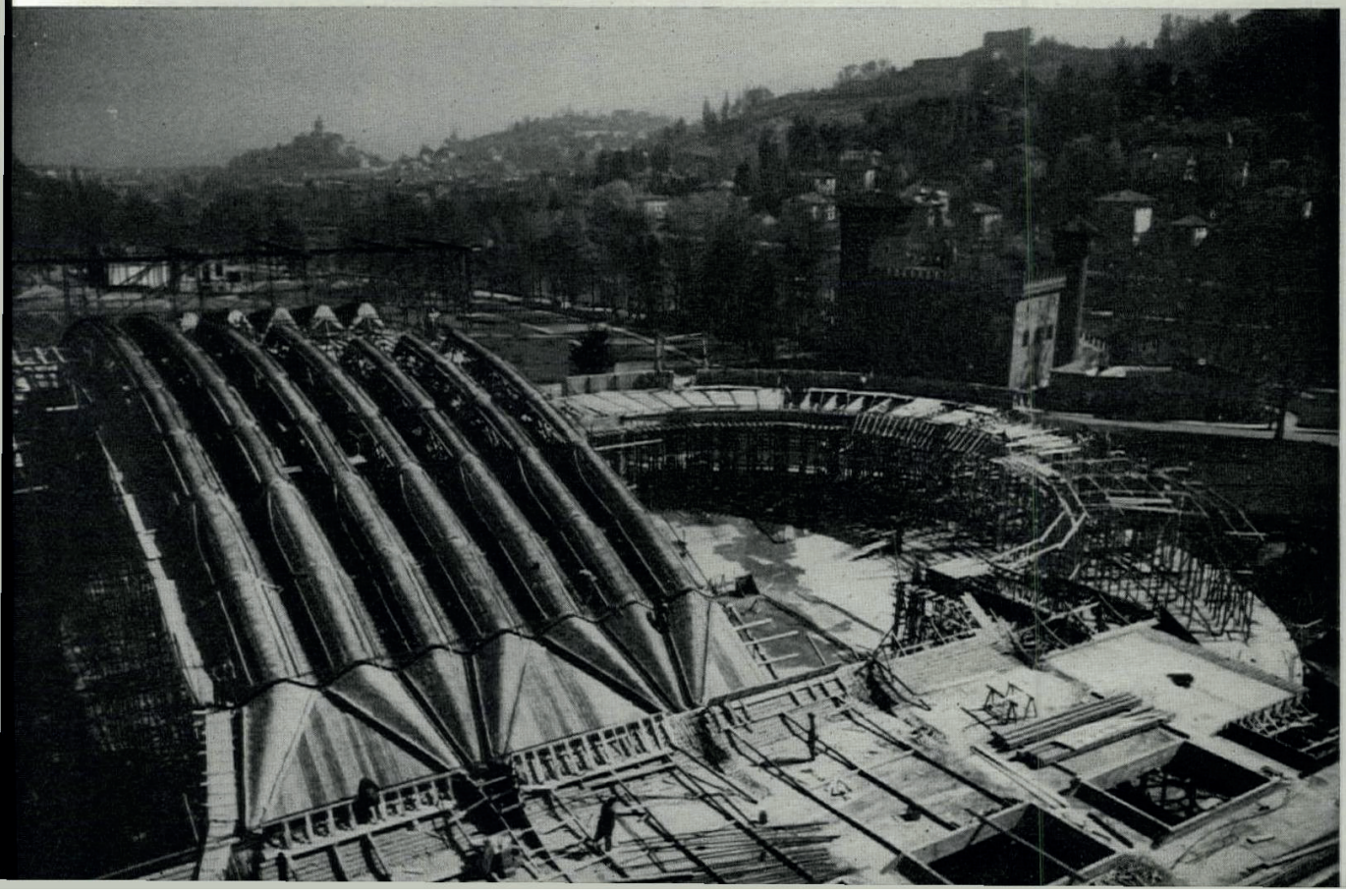
Mesh and reinforcing bars were left jutting from the edges of the shells to serve as connectors when the sections were in place on the scaffolding. They were finally bonded together and the whole structure was made monolithic by concrete poured on top the prefab sections.

Tubular metal formwork, easily demountable and re-usable, supported the barrel while it was being assembled. This was done by quarters; the scaffolding was moved after each quarter was completed—but did not have to be demounted, just lowered slightly and shifted. Work went fast—an average of 30 of the big prefab elements were placed each day.

The rotunda at the end of the barrel posed its own problem, since the supports had to be high, slender and infrequent for good circulation and vision. This turned out to be a prefab operation too.



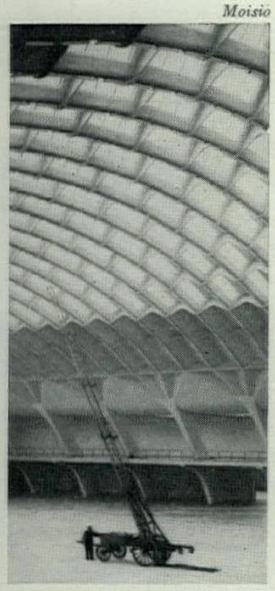
The web of strips visible in the ceiling does not support the cupola. That job is done by curved diamond shaped slabs which rest between and above the ribs (which are only separators and stiffeners).



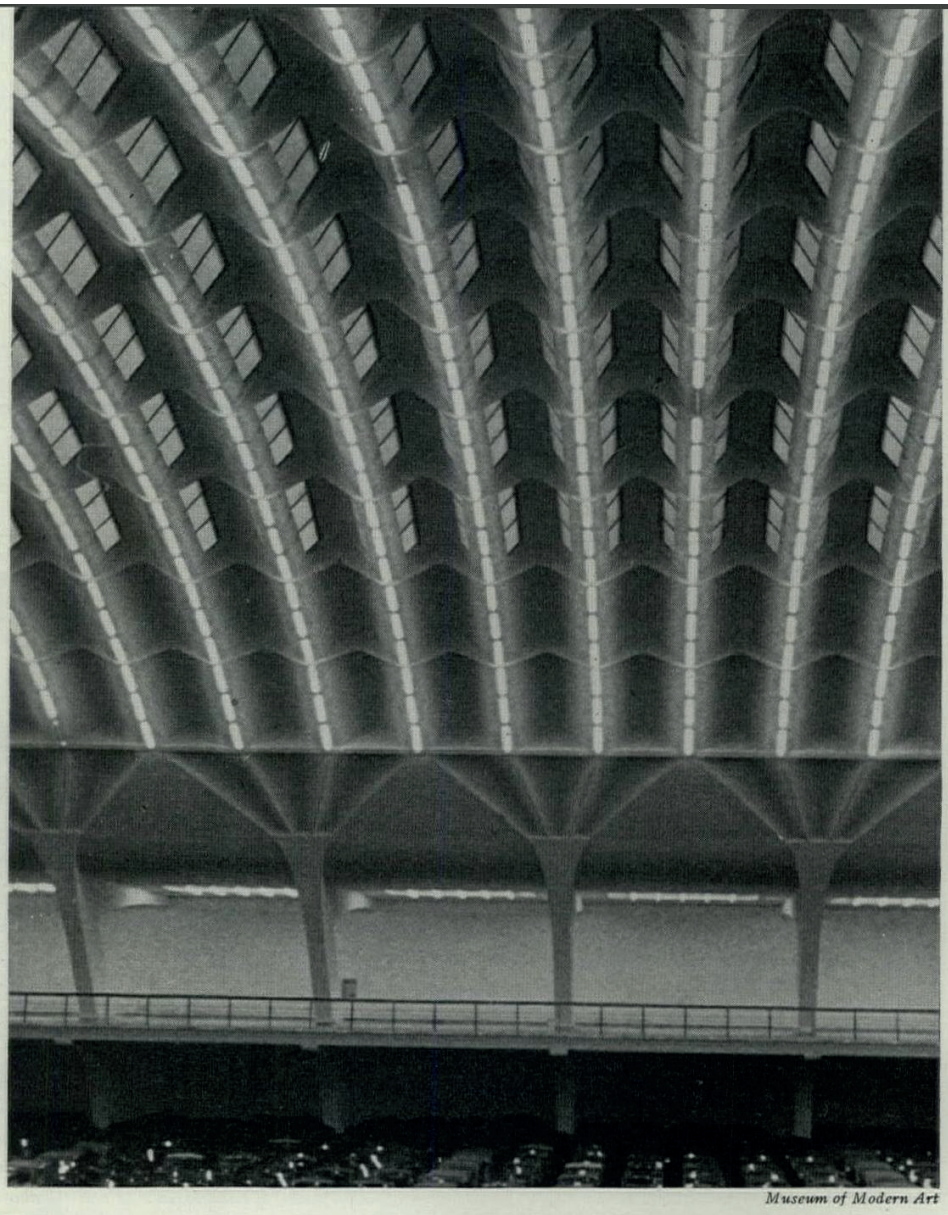
EXHIBITION HALL, TURIN

A final touch to the engineering is provided by the unusually adroit use of fluorescent tubes to light the great hall at night and on dark days. Naked, in pairs, the lights follow the transverse arches in lively structural pattern.

Moisio



Also lively is the job of climbing a ladder and replacing burned-out lamps that flicker off the morning after a big exhibition night like the one shown below.



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Moncalvo