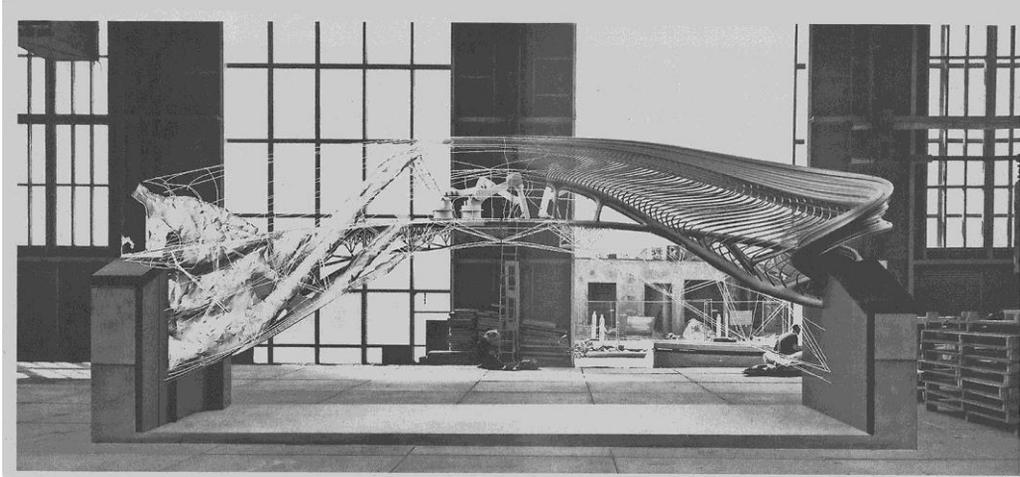


Future design leaps forward

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Joris Laarman's workshop rendering of a pedestrian bridge for a canal in Amsterdam. The rendering is being executed by robotic 3-D printers. A Laarman exhibition is at the Cooper Hewitt, Smithsonian Design Museum in New York through Jan. 13.

Furniture design leaps forward

DESIGN REVIEW

A Dutchman is making pieces using technology from biological research

BY JOSEPH GIOVANNINI

If nature needed to grow a chair from the ground up, Joris Laarman thinks he knows how it would look. This 38-year-old Dutch designer matched an algorithm about bone growth and fed it into a computer that digitally printed a ceramic model for a chair that is now sitting innocently — as though it were no big deal — in Joris Laarman Lab: Design in the Digital Age, at the Cooper Hewitt, Smithsonian Design Museum in New York. The designer didn't sculpt its forms to look organic. Generated with nature's own codes for growth, it is organic. Mr. Laarman, actually, was only the midwife.

But the cast-aluminum Bone Chair is a big deal. Remember when Dolly the sheep was cloned in Scotland in 1997? With a seat and backrest supported by what looks like antlers morphing into chewing gum, the chair is the Dolly of furniture design: a breakthrough generated by new technology, in this case the marriage of biological

algorithms and smart software. Skeletal, almost pigeon-toed in its awkwardness, it looks unassuming, but in 2006 its introduction was a design achievement.

Such technological breakthroughs have occurred before: In the 1940s, Charles and Ray Eames's experiments in molded plywood made possible their "plato-chair" chair (the DCM), which defined midcentury Modernism and endures today as a classic.

What distinguishes Mr. Laarman and his curious, provocative chairs and tables from the Eameses and other Modernists is that he is operating in

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the paradigm shift from industrial to digital design. From the mass production of standardized parts and objects to their mass individualism. Computers armed with smart software can manufacture unique pieces instead of churning them out by the thousands. The computer has made individuality and complexity feasible.

The aluminum chair is part of Mr. Laarman's series Bone Furniture, which includes a long table and an

inviting chaise longue, all with branching legs strengthened where support is needed. Another series was based on a completely different technological premise: A robot assembled three Rococo tables out of tiny cables, called voxels, that add up to curving shapes, like the dots in a Chuck Close painting, but in three dimensions. In a third series, tablechairs, Mr. Laarman riffed on that Danish icon of fluidity, the famous polyurethane Panton chair and staged a lineup of a dozen knock-offs built from parts stamped out in different patterns, like a 2-D puzzle. Pick a pattern on the internet and it will be flat-packed and sent to your home for do-it-yourself assembly.

Surprisingly, for a show brimming with intriguing pieces, furniture is not the main point. Like Philip Johnson and Alfred Barr's famous "Machine Art" of 1934 at the Museum of Modern Art, Mr. Laarman's exhibition highlights the machine. Today, the machine is the computer, endowed by software with transformative technology that Mr. Laarman has pushed to extremes.

Andrea Lipps, an organizer of the show, explains that the Joris Laarman Lab took digital printing "out of the box" by attaching nozzles to walking robots. Beams ejected from the nozzles print up an object in layers. The robots move about freely on a production floor and can produce large-scale objects anywhere, even outdoors.

Mr. Laarman's lab started working with robots in 2010 and spun off a robotics company, MX3D. His long-armed flood used a fast-curing resin that resists gravity, which allowed the robot to print doubly curved lines in midair, as though drawing lines free-hand in space. MX3D's acrobatic handwork can be seen downstairs in the Carnegie Museum, which houses the museum, at the foot of the dark, oak-paneled staircase, where a large, sweeping piece, called Dragon Bench, serves as a teaser for the show. The pillowy, wire-frame structure turns in space like a dragon — created to appear like a topological diagram of continuous curves from a math book. The grace and beauty of the piece mask the advanced technology that enabled it.

Designers have predicted that houses one day, perhaps soon, will be digitally printed on site. In fact, an MX3D robot, having recently graduated from resin to molten metal, is already printing a pedestrian bridge for a canal in Amsterdam, which is projected for completion in 2018. The robotic printer is laying out the welded stainless steel surfaces of the bridge, with the support of an integrated branching truss, in a factory. Had the old, historical embankments been a sturdier construction site, the robot could have welded the bridge over the canal as visualized in the show.

The curving, fluid forms of the bridge suggest a tentative new aesthetic resulting from the marriage of the walking robot to the digital printer. But Mr. Laarman has many applied the new technology to reinterpret classics like the Eames chair, vintage Louis XV-style tables and contemporary pieces like the Marc Newson chaise longue. Recycling the classics dodges the enticing issue of how extreme technology could generate extreme design. Mr. Laarman's work might eventually lead to a vision if he develops a language from the technology he is courting, but the bridge is the

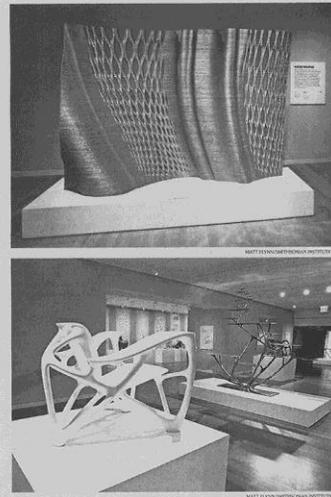
only glimmer of an attempt.

"Joris Laarman Lab: Design in the Digital Age" is not just a show for nerds or design groups. It is, in its high-tech way, a crafts show. Ironically, the nimble nozzle of the MX3D robot represents a return to the hand and its ability to create detailed, unique objects with worked surfaces. You marvel

at the lacy handwork of the Dragon Bench in the same way you appreciate the Carnegie Museum's paneled staircase. Each is crafted.

Surprisingly there have been remarkably few exhibitions in New York devoted to the intersection of design and the transformative technology introduced two decades ago in the

3-D software developed for filmmaking and automotive design. Mr. Laarman, a prominent and inventive member of the expanding digital design tribe, is not alone. The show would seem to welcome visitors to a brave new world. But it not only represents the world of the future; it is announcing the brave new present.



Top, "Griffon's Steers" (2017), a sculptural work, and above, in the foreground, a so-called bone chair, composed using an algorithm that mimics the structure of bird bones.