BUCKING THE TREND

The American inventor Buckminster Fuller was considered a maverick, and even an eccentric outsider for his radical ideas in the 1930s and '40s. Though these did not always lead to commercial success, his new ways of thinking inspired a generation. He was truly a man ahead of his time, says Jonathan Glancey

Richard Buckminster Fuller was a remarkable man – an architect, designer, environmentalist, author of more than 30 books, and philosopher of the modern age. Recognizing the potential of design to solve humanitarian problems such as transportation and housing, he spent his life working across multiple fields, trying "to make the world work for all of humanity."

In his early life Fuller had worked in a Canadian textile mill, toiled in the meat packing industry, and served as a commander of a U.S. Navy crash rescue boat. He saw his four-year-old daughter, Alexandra, die of influenza, and took to drink as his first attempt at designing mass-produced, low-cost housing sank beneath his feet. In his early thirties, the American inventor from Milton, Massachusetts, was unhappy and broke.

But Fuller bounced back, as he was to do many times in a rollercoaster career, bubbling with new invention. There was to be a flying car, factory-made homes, strong, lightweight geodesic domes, all of them underpinned by a memorable way with words. To Fuller we owe the term "Spaceship Earth," the precious vehicle with which humanity negotiates existence. It had one particular problem, observed Fuller: "an instruction book didn't come with it."

If humanity was to thrive and Earth survive, we needed, he insisted, "to do more with less" while reinventing the wheel if need be. So when Fuller designed an automobile, it was like nothing else on the road. Launched on an unsuspecting U.S. press and public in 1933, the Dymaxion car, looking like a cross between a V.W. trailer and a miniature zeppelin, was simply the "land-taxiing phase" of a vehicle that, soon enough – and jet-propelled – would take to the air. Fuller described the Dymaxion to his adored second daughter, Allegra, as a "*zoom*-mobile," a car that

Previous spread: originally constructed in 1959, the world headquarters of the American Society for Metals in Ohio combines Fuller's geodesic dome (the world's largest open-air example) with a modernist glass building by the architect John Terence Kelly. This page: Norman Foster fulfilled his dream of building a replica Dymaxion, which was finished in 2010. Its ash frame is sheathed in hand-beaten aluminum, and it's painted in striking racing green with a white roof

could "hop off the road at will, fly about then, as deftly as a bird, settle back into its place in the traffic." Ultimately, Dymaxion cars would carry lightweight, fully fitted Dymaxion houses by air to anywhere boldy going Americans wished to live. Here was a dream of life, liberty, and the pursuit of happiness underpinned by advanced technology.

The 20-foot Dymaxion (its name a composite of three words the young inventor used over and again in loquacious public talks: dynamic, maximum, and tension) was, he claimed, capable of 120mph. He himself, he enthused, had driven a Dymaxion two hundred and fifty thousand trouble-free miles. Deals, he boasted, were being struck with major U.S. automobile companies. Soon enough, there would be a quarter of a million 12-seat, three-wheeled Dymaxion cars scything along the highways.

Fuller's fecund imagination tended to get the better of him. Breathtaking though it was to look at, as Jeff Lane, founder of the Lane Motor Museum, Nashville, Tennessee, and the British architect Norman Foster have since discovered, the Dymaxion car was a bit of a handful, and it is not surprising that just three prototypes rather than hundreds of thousands were built. Both men have commissioned Dymaxion replicas and both, although forgiving of Fuller, know perfectly well that an 85bhp (brake horsepower) flathead Ford engine was never going to propel the streamliner at a rate of two miles per minute, while its extremely low-geared steering and recalcitrant single rear wheel were hardly conducive to safe, let alone fast driving.

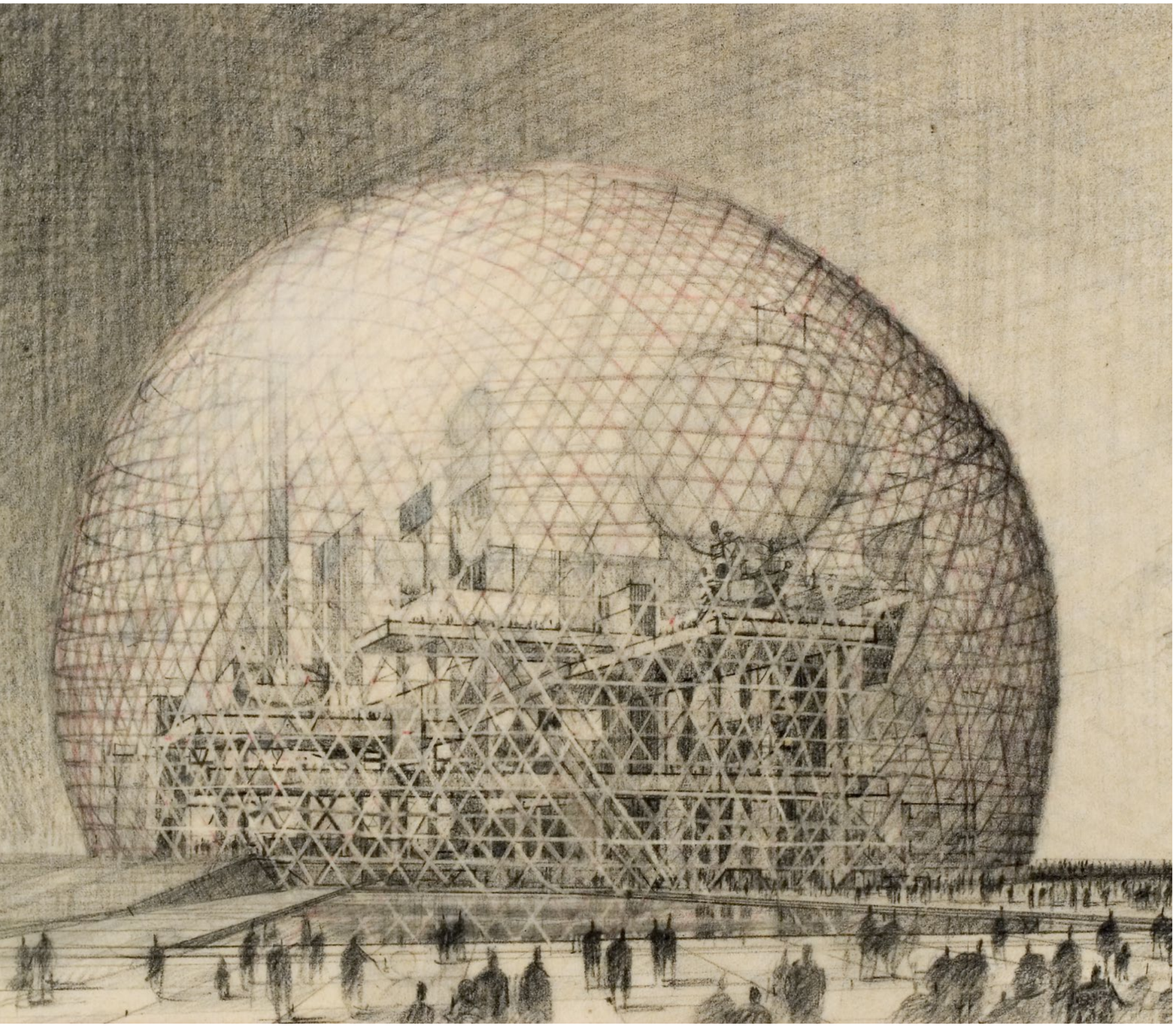
As for launching such an adventurous car in the teeth of the Great Depression, Fuller was clearly on a fool's errand. It was little short of satire when he told the American press that the production model would sell for as little as $200, less than half the price of a stock 1933 Ford Model B. When, in 2008, Norman Foster decided to recreate a Dymaxion, he knew it would be a costly undertaking. Phil King of Crosthwaite & Gardiner, the celebrated racing car restorers of East Sussex, England, flew to Reno, Nevada, to examine the sole survivor of the three original Fuller cars. It was, he told me, "unlike anything I'd seen before. You almost have to forget everything you've learned about car engineering to understand how it works."

The compromises involved in the car's design, along with its great weight, meant that it was no flyer. Fuller, however, brushed off criticism of his invention. He had at least, he said, learned a lot and that this is what mattered. As Jeff Lane told the *Wall Street Journal*, "It was an experimental time, and the automotive business was a sexy business to be in, like Silicon Valley."

Like the Dymaxion car, the Dymaxion house was also a heroic failure. Developed from the late 1920s, this was a prototype designed for mass-production. Fitted with ingenious built-in low-energy kitchens and bathrooms, and making dexterous use of natural ventilation and cooling, the Dymaxion house was to have been delivered as a low-cost kit of parts and assembled on site. When in 1942, the U.S. Army Signal Corps ordered two hundred Dymaxion Deployment Units – a basic military model – it looked as if the futuristic house might truly have a future. In the event, a shortage of steel put paid to further orders.

Twelve years later, U.S. Marine Corps helicopters were deployed to fetch and carry Fuller-designed geodesic domes. Made of wood

PHOTOGRAPHS: JEFF GOLDBERG/ESTO GREGORY GIBSON THE ESTATE OF BUCKMINSTER FULLER CARL SOLWAY GALLERY



FULLER INVENTED A WAY OF MAKING THE DOME FROM A STRONG, LIGHT LATTICE OF INTERLOCKING ICOSAHEDRONS

and plastic, and later from magnesium, the domes – designed for assembly by soldiers in 135 minutes – could be ferried wherever the Marines saw fit. Here was the Dymaxion ideal in action, although with helicopters playing the part of the Dymaxion car.

The earliest known geodesic dome, created by Walther Bauersfeld for Carl Zeiss, appeared on the rooftop of the German company's factory in Jena in 1926. It housed a planetarium projector. Working with the artist Kenneth Snelson, Fuller refined the mathematics of the dome while inventing a way of making it from a strong, light lattice of interlocking icosahedrons. These could be covered in protective skins of glass, plastic, fabrics, and aluminum.

Fuller's domes found favor as weather observatories, early warning radar stations, storage depots, polar exploration bases, and, in the 1960s, in the guise of two spectacular exhibition pavilions – one at the 1964 World's Fair, New York, the other at Montreal's Expo '67. The Canadian dome caught the eye of the young Norman Foster, who employed Fuller as a consultant in his London office until the inventor's death in 1983.

The Spaceship Earth pavilion (1982), a geodesic dome at the Epcot Center, Florida, was an ideal symbol for Walt Disney's utopian city of the future. Today, it is used to tell the story of human communication from cavemen to the foreseeable future, although one without flying cars ferrying factory-made homes.

Attempts have been made at geodesic dome living, beginning with "alternative" U.S. communities in the 1960s, notably Drop City in southern Colorado, yet properly resolved geodesic domes are expensive pieces of hardware. Highly engineered, they were not really the stuff of hippy encampments. Nor – Mr. and Mrs. Buckminster Fuller aside – have many home-buyers been taken by the idea of a house that, hard to divide, seems better suited to life on Mars rather than in Montana or Maine.

"I just invent," said Fuller, ever the optimist, "then wait until man comes around to needing what I've invented." What Richard Buckminster Fuller still offers us is not so much strong, lightweight domes, dreams of assembly-line homes, and streamlined cars that might just fly but an abiding belief in enlightened human progress underwritten by sheer, joyous invention.✥

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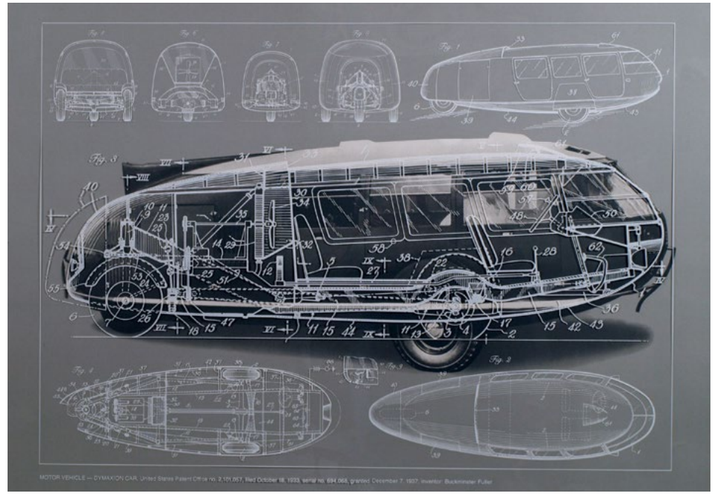

Fuller (above) designed his geodesic domes to be sustainable and easily replicable. He had been perfecting the structure's design for 20 years by the time he conceived his biosphere for Montreal's Expo '67 pavilion (far left) – so spacious, it easily fit a 7-story exhibition building inside it. Left: the anatomy of a 1933 Dymaxion car. It was steered by a single rear wheel, which acted like a boat's rudder