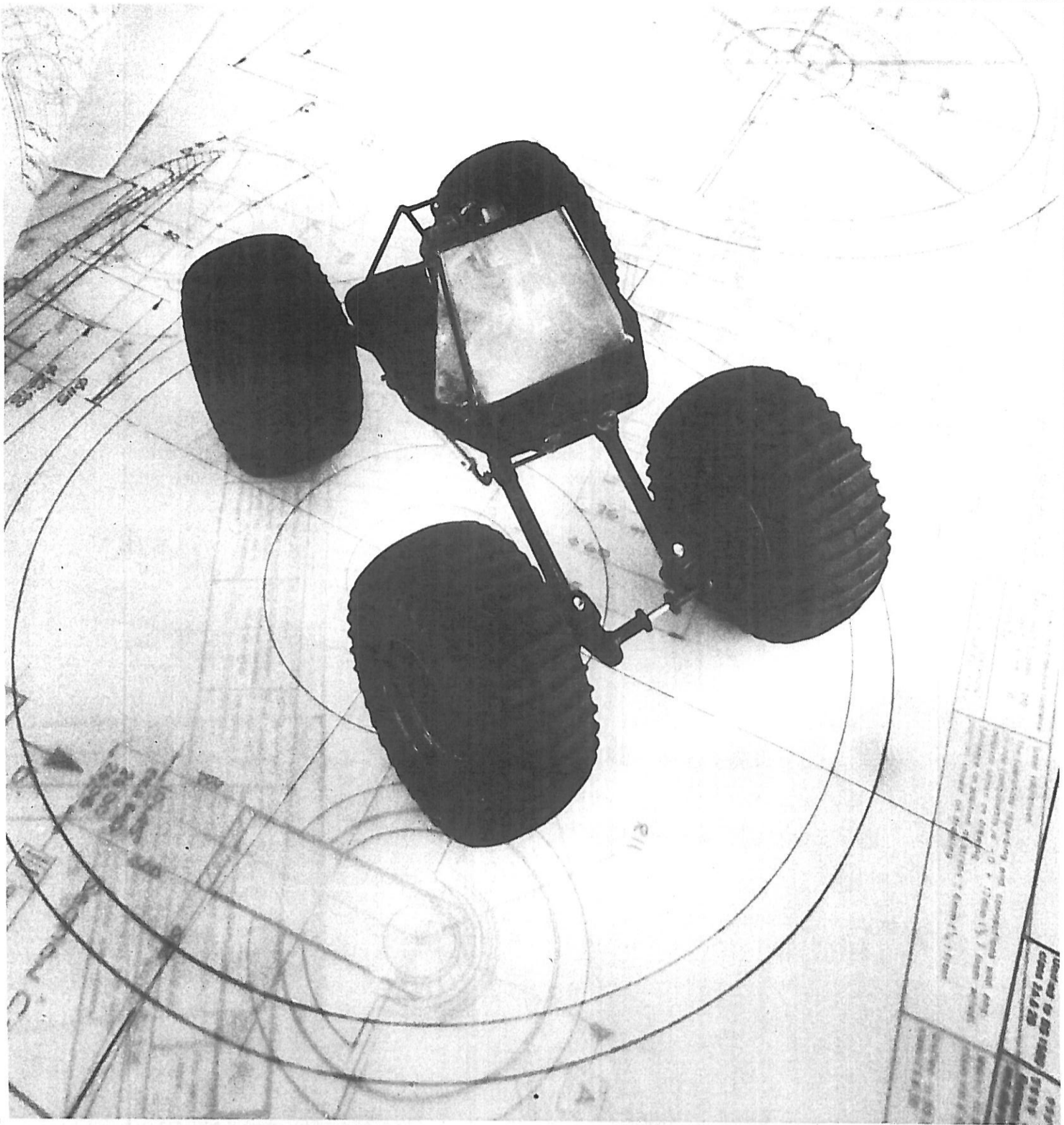


James Dyson, left, takes design back to its logical conclusion. He doesn't just design, prototype and market the product, he invents it too. It is a combination that is almost unique in this overspecialised era, but which is not without its problems. Most of his work is aimed at highly-specialised military or industrial markets. But his ingenious vacuum cleaner marks a return to the consumer products area that he has avoided since chastening experiences with his Ballbarrow.



Model of Dyson's 40mph Wheelboat. The craft floats because of the massive inflatable tyres; and the tyres both propel it (because of their treads) and allow it to plane over the water with no slippage. The engine is a low horsepower unit. The Wheelboat can ride on mud, snow and ice, and is designed to be kept in a garage. Already Avon Tyres, the giant rubber combine, is interested in it.

THE LAST OF THE INVENTORS?

JAMES WOULDHUYSEN PROFILES JAMES DYSON. PHOTOGRAPHS BY IAN DOBBIE

The 20th-century has its celebrated artists, designers, scientists and technologists; it has, too, its celebrated architects and engineers. But the 20th-century inventor is not held in high regard. The watchmaker James Watt and his steam engine, the barber Richard Arkwright and his throstle-spinning jenny, the jeweller Robert Fulton and his steamship – these were geniuses of the 18th century, whose ideas were applied in the 19th century. Who, though, can name a serious biography of a major modern inventor?

The explanation is obvious. The successful inventor combines a number of skills in what is bound to be a rather idiosyncratic way. By contrast, the 20th-century divides skills up systematically. Thus it is permissible to be an artistic genius (Picasso) or a scientific giant (Einstein). But to be an inventor is to be a crank, or one of those Victorian individualists whose remote-operated hats are the subject of many a

lavatory reading book; it is to be satirised by Philip Garner and hawked through *Exchange & Mart* (*Blueprint* No 3, December 1983). Today there is a mass of small failed inventors around and no giant to lead them.

In terms of financial reward there is only one job worse than inventing things and selling them to manufacturers and that is writing instruction manuals. It has taken engineers 100 years to be accepted by money men in Britain; designers have been half a century being accepted by accountants and marketing men; one day ergonomists may triumph with corporations and in the meantime nobody can take architects straight. But when you're an inventor

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everybody shafts you. I remember hearing on LBC the poor inventor of a rather unattractive but apparently popular game being interviewed at length on how his manufacturer had stolen his idea and had then ripped him off so repeatedly that his family was driven into destitution. Well, James Dyson, a man whose parents were classicists and teachers, who trained in fine art, furniture and interior design and who has since "picked up" (his words) enough engineering to invent new wheelbarrows, vacuum cleaners, wheelchairs and seaborne assault craft – he has had his share of rip-offs too.

Dyson, 37 going on 24, is, however, riding high. Disappointed with the UK distributors of his cyclonic, Brighton-rock pink, baroque vacuum cleaner, he and his entrepreneur partner Jeremy Fry have signed a deal to have the machine sold in the USA. Meanwhile, aided by a £20 000 cheque from Action Research for the Crippled Child, the

two have developed a Snowdon wheelchair design far enough for their handiwork to be undergoing secret tests in France; and Dyson's elephantine Wheelboat, which rides up on the sea on vast rubber wheels, is nearing completion. Prototypes Ltd, Dyson and Fry's workshop and studios in Bath, prospers. A few miles away, at Bathford, Dyson's palatial Bathstone house boasts a swimming pool which he excavated himself and which has weathered two summers. Even the bathroom plumbing, his illustrator wife Deirdre jokes, goes right some of the time.

Dyson's West Country base, his aristocratic voice and physiognomy and his connections with people like Snowdon and Hugh Casson are three aspects of the man that baffle at first. A lethal fast bowler and springy tennis server on his own lawn, he appears to lead a charmed life. But the reality has been rather different. The royalties Dyson's vacuum cleaner will earn with Amway were only agreed after relentless self-financed flights to the States and double-or-quits replies to "final offer" telexes in italics. Even now Dyson regards Amway, Grand Rapids' answer to Tupperware and Argos, less as a final client and more as an *entré* into volume sales and thus a means of confirming his invention's commercial viability. Amway stands for (the) "American Way"; it is Dutch in origin, religious in orientation and has senior executives whom its own more enlightened staff describe as "barracudas with an education". At times, the company's lawyers quibbled about particle-whirling patents which Harwell's Atomic Energy Authority has bought and which took Dyson 3500 separate experimental runs to arrive at. The commercial shenanigans were a fitting finale to years of technical tests and bank loans with frightening conditions attached.

"To be an inventor," Dyson says, "you've got to be a total fanatic." He makes this out to be an occupational hazard, something to be rueful about but not short-circuited. Perseverance is essential because the only

way to make an engineering breakthrough is by intuition and repeated trial and error. Dyson has time for Brunel, but little for his successors and their writings: "The books are dry and uninformative, and engineers themselves spend all their time explaining why what you had in mind simply *can't* be done . . . when in fact it can." While his children play with Scalectrix, Spectrum educational games and battery-operated pencil sharpeners, Dyson cuts the grass with a petrol-powered lawnmower complete with wooden running boards: he races about, as if driving a chariot. The man is surrounded by gadgets which engineers once sneered at but would now delight in.

After winning an *Eagle* painting contest at the age of 9, Dyson went on to the Byam Shaw, where he met his wife. Then he studied under Casson at the Royal College of Art. It was while designing and installing auditorium seating for the Roundhouse that he met Jeremy Fry, a friend of Snowdon's and the man who saved Bath's Theatre Royal from extinction. Still at the RCA, Dyson teamed up with Fry on his first major technological project: a fast-moving and unsinkable waterborne vehicle known as the Seatruck, sold by a Bath company by the name of Rotork Marine.

As is the case with Dyson's Cyclon vacuum cleaner, the Seatruck relies on some clever physics for its unique features. At a glance, it looks like a D-Day landing craft; but the sharply pointed one-moulding GRP hull and the side skegs are there for a purpose. At its front, the Seatruck generates an air ramming effect which provides lift and generates foam. The foam is then trapped under the main body of the boat by the side skegs, creating a frothy cushion. This allows the Seatruck to skate over water

with considerably less frictional resistance than comparable craft. The result is that the boat can travel at speeds of up to 65 mph. A GRP/polyurethane chassis built with a star-shaped frame gives the Seatruck enough rigidity to handle 3ft waves and 4000lb payloads with ease.

Despite the vessel's proven seaworthiness, Dyson recalls, the Seatruck failed to find takers for some time: "Until you get that first sale and somebody else can vouch that your design actually works, people just aren't convinced." Eventually, however, customers flocked to Rotork. Seatruck was used to go mining in Canada, to lay cables under the North Sea and to ferry Land Rovers across the Solent. The biggest markets were in the Third World. Dyson tells how the foreign minister of Sudan once took the helm on a demonstration in a collar and tie, how sales to Colonel Gaddafi were marred by Libyans bugging his hotel room in Tripoli, and how Malaysia took dozens of Seatruks to deal with insurgents in its marshes.

While he was in his early twenties, therefore, Dyson straddled the blurred boundary between civilian and military design - a boundary which Britain's design *cognoscenti* have only come to be aware of over the past year or so (see *Blueprint* No 2, November 1983). Today he is unabashed by his product's military applications, although he certainly does not leap to their defence. It is his Ballbarrow which really gives him pause for regret.

Following the success of the Seatruck, Dyson came up with a range of one-shot polyethylene wheelbarrows which rolled along on tough, pneumatic plastic balls mounted on nylon bearings. It was, as *The Sunday Times Business News* put it in heady 1973, "The first fundamental change to wheelbarrow design in 4000 years." Even the 3cu ft capacity model weighed only 8kg; the non-stick bins meant easy shovelling and handling of cement; and the broad balls and thick, integral, widely-spaced feet meant that barrows sank into soft ground rarely, if at all. More than anything, though, the low

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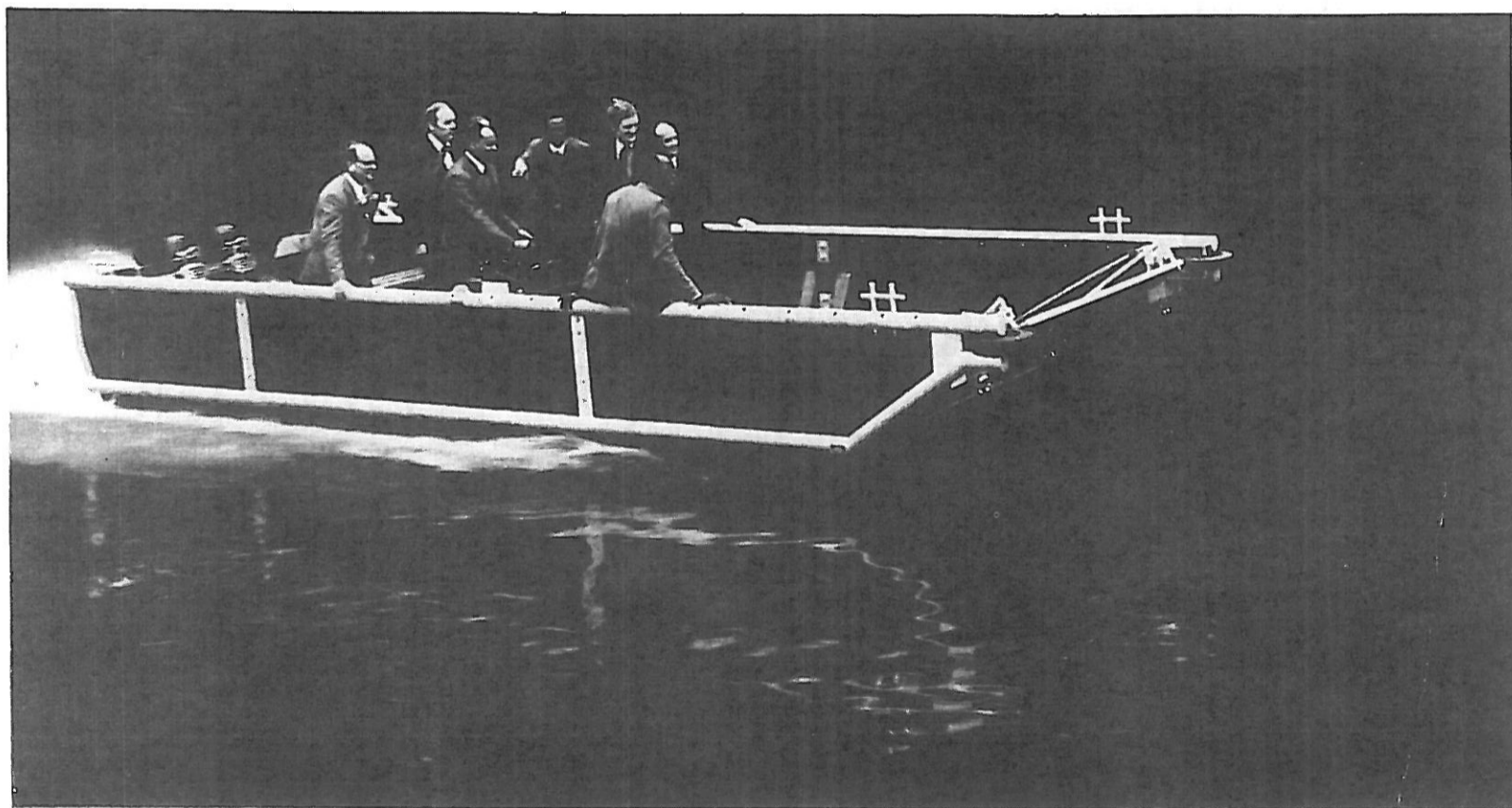
centre of gravity made it a doddle to push.

Within a month, Dyson and a partner, in the shape of his sister's husband, were turning over 150 units a week on the back of - yes - ads in *Exchange & Mart*. Prices started as low as £18.99, demand was intense, and the two decided to move into high volume manufacture. The move brought disaster. It wasn't just that marketing barrows through Britain's notoriously conservative hardware stores was an entirely different proposition from selling by post. What volume manufacture meant was cash-flow nightmares, therefore multiplying directorships and, eventually, Dyson being squeezed out by a member of his own family: his brother-in-law. Even now his lip curls at a mention of the episode. Technically his design was faultless, but the upshot was that he was forced to put his house in hock. As for the firm that once had been his, it went into liquidation, though not before the "Ballbarrow Corporation" of Itasca, Illinois, had made a killing on Dyson's work in the States.

The experience made Dyson decide to steer clear of any future direct involvement in production and marketing. It also gave him a barely-concealed loathing for money-men. With his Cyclon, his wheelchair and his wheeled boat he has been much more cautious, and with them, too, he is likely to gain the financial independence which he regards as essential to the business of serious inventing today. Still the right side of 40, aided by charm, impishness and a woman who could have dismissed any of his projects as chasing rainbows, Dyson may well emerge as the last of the world's great inventors.

"Until you get that first sale and somebody else can vouch that your design actually works, people just aren't convinced."

The Seatruck at speed with Sudan's foreign minister (and minister of health, as it happened) at the controls. Dyson managed to sell Khartoum 30 units worth £1.5m - a lot of money in 1974. Seatruks have been known to overtake hovercraft going flat-out.



The Cyclon vacuum cleaner has its centre of gravity positioned so that its head always floats perfectly - no matter how thick the carpet. A valve mounted at the base of the machine shunts the vacuum from head to detachable handle-cum-hose-pipe, allowing it to double as both vertical and cylindrical model (good, in other words, for both big carpets and awkward stairs). Bagless, the machine uses two cyclones to strip air of dust and deposit the latter in a smoked acrylic cylinder. Emptying this is a pleasure, below left.

Dyson's Ballbarrow, right "It's still in production, but it isn't selling nearly as well as it could be. The thing needs a product champion to push it - you have to be a total fanatic to market a good invention just as much as to develop it."

