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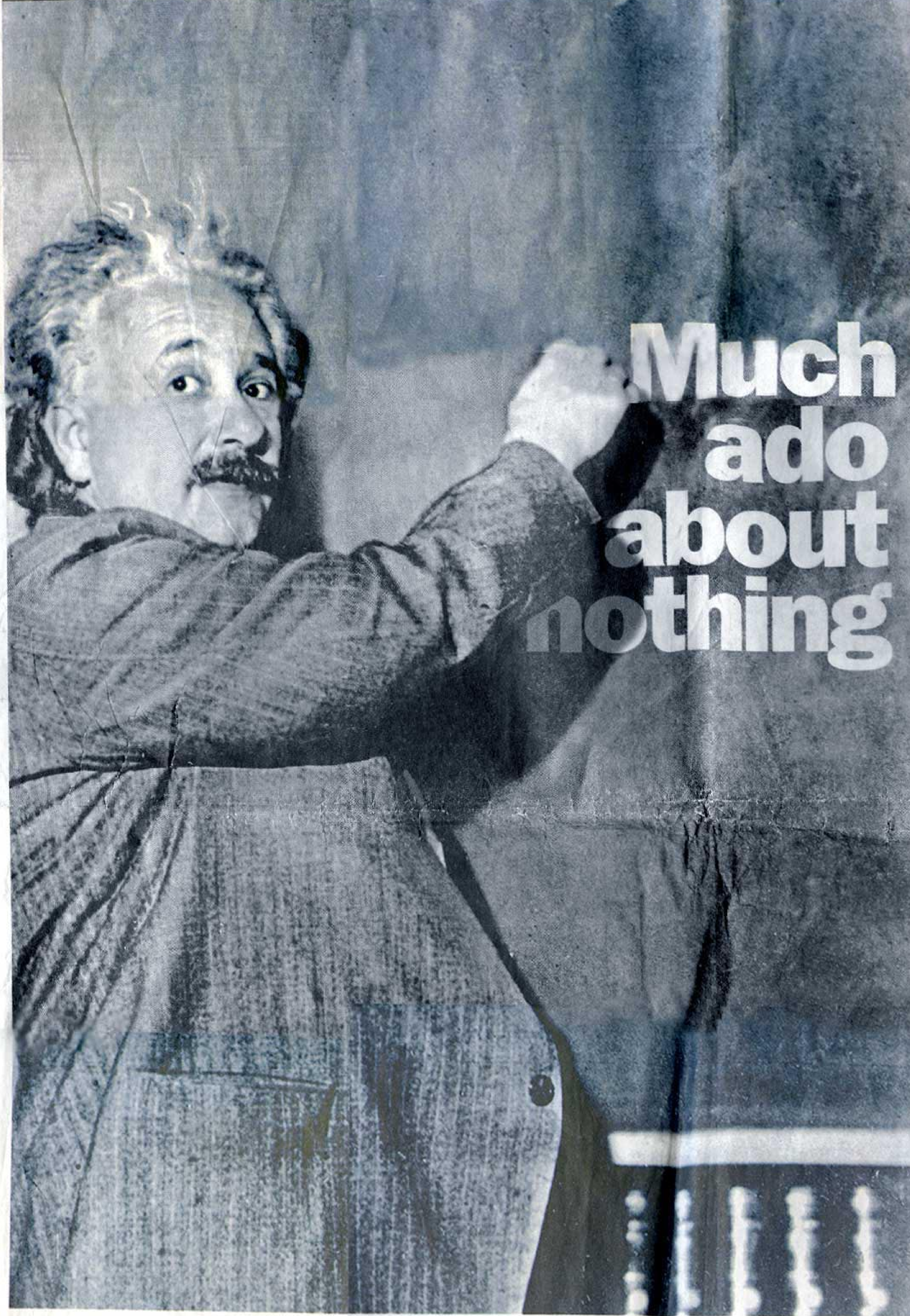

Much ado about nothing

Once, the aether was everywhere. Now it isn't. 100 years ago Albert Einstein began a revolution in our understanding of the universe, writes **Humphrey McQueen**.

A *NEW YORKER* cartoon showed a television news reader reporting from the annual meeting of the American Physical Society, where participants had just agreed that everything they knew about the nature of the universe was "wrongedy, wrongedy wrong". That a joke in the *New Yorker* is no laughing matter received further confirmation last July when Stephen Hawking renounced his belief that information could not escape from black holes.

The puzzles facing mathematical physicists today had their parallels 100 years ago. In 1905, a 26-year-old clerk in the Swiss Patents Office, Albert Einstein, published the first of his papers that would overturn our picture of the world. Atop Einstein's list of discards was the aether.

If nature abhorred a vacuum, seemingly empty space had to be filled with something or other, to which the ancients had given the name "aether", derived from the Greek for aethereal fire. Einstein's dismissal of aether as "obsolete" justifies the older spelling, rather than "ether", which invokes a different mind-numbing substance.

Belief in aether had been a useful construct but ended its days as a label for collective confusion. Its longevity offers insights into why scientists will cling to speculative ideas. Its prolonged death is the dark side of the story of Relativity, making it the unwelcome guest at this year's celebration of how brilliant physicists can be.

Aether is also forgotten because its half-life is a reminder of how many such geniuses have been in thrall to the occult.

The fondness for aether did have valid underpinnings, because the alternative would have been to allow for "action at a distance", which threatened a return to all manner of mumbo jumbo. Scientists had marginalised any notion of aether as divine. But if aether were not angels in motion, what was it?

A jelly metaphor introduced in 1838 gained support; if aether were any kind of solid, it would act as a drag on the velocity of light passing through it. In the early 1880s, two investigators in Ohio, Albert A. Michelson (1852-1931) and Edward Morley (1838-1923) set out to measure that effect.

This is how Michelson explained his experiment to his children: Two beams of light race against each other, like two swimmers, one struggling upstream and back, while the other, covering the same distance, just crosses the river and returns. The second swimmer will always win, if there is any current in the river.

Their 1887 measurements resulted in a dead heat — a "Null". Could it be that there was no current — that is, no aether — for the light to swim against?

The battle was now on to preserve the aether. Well into the 1920s, experimenters tried to overturn the Michelson-Morley results. Others proposed that the earth dragged aether along with it. If so, aether need not alter the velocity of light crossing its path.

More profound challenges to the nature and functions attributable to aether were spreading from discoveries in electro-magnetism. From 1864, and working from the research of Michael Faraday (1791-1867), the mathematical physicist James Clerk Maxwell (1831-1879), supplied mathematical proofs that light was a "mutual embrace" of magnetism and electricity.

Scientists think through metaphors as well as with data. For instance, Faraday's version of Christianity had led him to believe that God's creation moved in circles, not linearly as in Newtonian mechanics. Faraday's theology encouraged Clerk Maxwell towards field theory.

The mathematical genius, Lord Kelvin (1824-1907), spent his declining decades chasing after an alternative to Maxwell's field theory, determined to establish a mathematical model of the aether. Kelvin gave up on the jelly version only to promote what one friend called "a froth theory". In desperation, Kelvin proposed that aether occupied the same space as the objects moving through it without their affecting each other.

Giving up the aether would have been easier had some alternative been proposed in its stead. Earlier scientific discoveries had gained acceptance in this way, with oxygen taking over from phlogiston and germs from miasmas. By contrast, the loss of aether suggested no tangible substitute. Several researchers hoped to retain aether as an electro-magnetic field. Beyond that, doubters were offered pure mathematics, which Kelvin called "merely the aetherialisation of common sense". Unfortunately, common sense was the problem.

Einstein escaped from this quagmire by leaping over aether as an article of faith.

One version of how he revolutionised physics would have us believe that he had built on experiments, such as Michelson's and Morley's, to arrive at a more coherent picture of the whole. On the contrary, despair at resolving the contradictions that had built up from experiments drove him to postulate conclusions from principles. The concomitant was to eliminate concepts that added nothing to this understanding. Hence, he dismissed aether as "superfluous".

Among the three tests that Einstein proposed for his picture of the world, the best known became the measurement of the effect of gravitation on light. The sun was so massive that its deflection of light passing from a distant star would be big enough to be calculated during an eclipse. The eclipse itself had no effect on this difference but merely allowed any impact to be viewed.

The first opportunity to test this hypothesis came on May 19, 1919. The experimenters had to photograph the eclipsed sun in a patch of sky with lots of stars. They then imposed these plates on ones taken of the same patch when the sun was elsewhere. The shots from Brazil registered that the stars were further out of alignment when the sun was nearby than when it was far away.

Because the calculations from this sighting were perhaps no more than 50 per cent accurate, not everyone was converted. In addition, critics wondered whether other solar effects had caused the shift.

Accounts from London of the Royal Society's discussion of the results from the 1919 eclipse had "flashed through the daily papers like a nine-days' wonder". The Melbourne *Argus* accompanied its report with an explanatory essay stressing that the challenge to conventional views threatened more than the replacement of one arcane orthodoxy by another. Henceforth, the article continued, nothing could be accepted as absolute.

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Bax to the future art

A man from the world of international finance now devotes his life to creation, writes **Lisa Bellamy**.

MATTHEW Bax left school at 16, studied accountancy and worked in grey suits for leading conservative companies in Melbourne and Munich in his 20s. But, unlike many of his former colleagues, he has never driven a smart car or lived in a penthouse apartment. In fact, he has never even owned a car, or a house, and the years he spent in the fast lane of finance were dominated by a passion for making art not money.

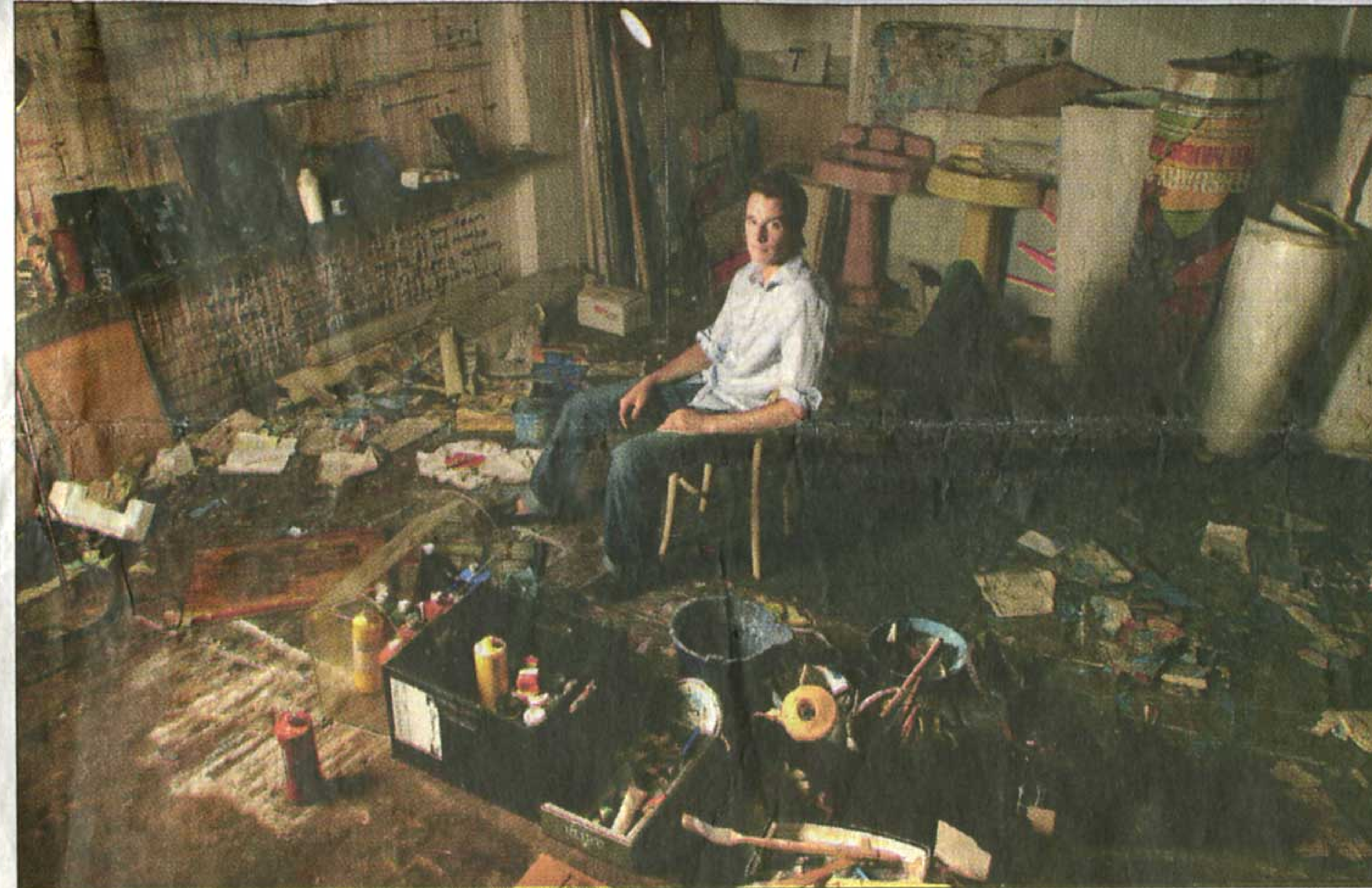
Sitting in his Richmond studio, an open garage-sized space at the rear of his tiny cocktail bar, Der Raum, which he bought in 2001, are the possessions that matter to him most: ripped newspapers, torn telephone books, dust, glue, pieces of string and splodges of coffee, which he mixes with acrylic paint to create objects mirroring his heartfelt thoughts on the world today. Travelling by public transport from his Port Melbourne flat, he works on his art by day and mixes drinks at night because, he says, "art is all that's ever mattered to me".

Self-taught, his early art in Melbourne comprised Rothko-like images of Melbourne's underbelly, its subways, lanes and construction sites. Recent work, influenced by years living and working in Germany, has seen a shift to a different abstraction in which everyday objects, both literal and created, are hung from walls "to symbolise how we take so many things in life for granted".

Born in Adelaide, Bax, 31, spent most of his childhood in the small agricultural town of Naracoorte in south-eastern South Australia where his father taught art at the local high school. When he was 13, the family returned to Adelaide where, courtesy of his father's appointment as art teacher at the prestigious St Peter's College, Bax started secondary school. "For as long as I can remember I was dragged around to galleries. I always knew I wanted to be an artist," he recalls amid the studio's clutter of paint, paper and glue, which is divided from the bar area by beer cartons, stacked in piles, floor to ceiling.

Quietly, he says he came from a modest background. "The only reason I went to a smart school was because Dad worked there. It was a tough environment, there was enormous wealth."

Bax spent his spare time after school and in the holidays doing odd jobs for Christie's and later the Paul Greenaway Gallery. He bought his first art — a work by Tim Storrier — in his teens, for $650. Yes, it was a lot of money, but he was working part-time and was also rewarded for his academic efforts by his parents who gave him $11 for every "A" grade attained.

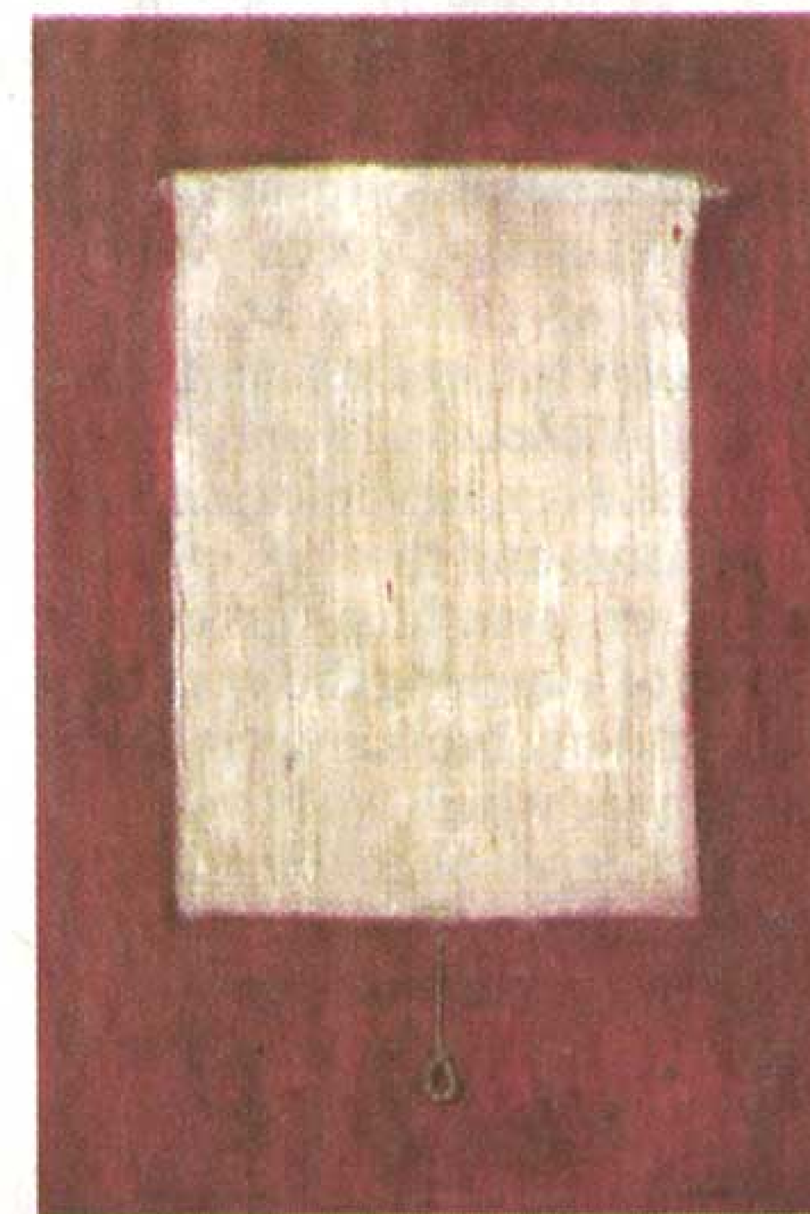


Matthew Bax's Richmond studio, where art rubs shoulders with bar culture. Below, one of his pieces. PICTURE: CATHRYN TREMAIN

It was because he was academically talented, as well as good at art, that he studied accounting at Flinders University "with the hare-brain idea that I'd use the degree to become an art dealer and artist." But with the '90s recession, his dreams were dashed, and Bax found himself in a leading Melbourne accountancy firm and an after-hours artist.

In 1997 he went to Munich — "initially for a girl, which was short-lived" — and worked as an accountant. "I was living a straight, conservative life at KPMG during the day and working on my art at night. I rented a small room, which doubled as a studio. It was a very productive time."

His shows at prominent avant-garde galleries, including Marquardt Ausstellungen in Munich, turned heads and provided the funds for his subsequent purchase of the Richmond bar. As well as urbanscapes, he also showed a body of work called *Red Dress*, which is based on "the comments of a horrible manager who told a female employee she'd never be taken seriously if she kept wearing a red dress".



Bax is the first to admit he is stubborn and competitive, and it took many years, he confesses, to build the courage to sever his ties with the high-flying world of finance. "Dad often said I'd earn better money as an accountant than an artist and that stuck for a long time."

But in 2001 he broke the corporate ties, returned to Melbourne and bought Der Raum, this time with "the hare-brain idea that the profits could support my life as an artist". Instead he has found himself living the reverse of the life in Munich: making art by day and earning a living at night.

His latest show at Uber Gallery — his ninth solo show in five years — is, he says, a turning point, as his work now bears a direct correlation, albeit unplanned and unexpected, between what he makes and what he thinks about the world in which he lives today.

It comprises 32 works, 10 based on holland blinds including pieces of the blind's fabric glued to heavily worked surfaces with binder impasto. Others are rendered with paint, dust, coffee and paper.

The 22 tea towels, similarly, vary between literal and mixed-media creations. Some feature grids made from string that Bax pulls over the surface of the canvas and ties behind it. "By taking away their functional purpose, the blinds and tea towels become something else, something inexplicable, a metaphor, perhaps, for what we take for granted. If they evoke something about the frustrations of daily life, if they force the viewer to ponder, to take stock, to take some time out to question things, I'm happy."

Bax recently returned from a three-month stint in Munich and is now considering moving there for two to five years because it has "more reference points for my work now".

The arts industry in Australia is difficult, he says.

"In Germany being an artist is regarded as a job. In Australia art is treated as a hobby and it's easier to achieve recognition in the hospitality industry."

He is also finding the emphasis on wealth in Australia "where people parade it in a flashy, American style" claustrophobic compared with Germany where "people with money go to great pains to hide it".

He says leaving school so young always gave him a sense that he had years up his sleeve. Now in his 30s, he is keen to take his art in new directions. "I didn't expect that my reflections of life would encroach on my art, but they have. I'm impatient to achieve everything I want. I'm also aware of wasted opportunities, of why it's necessary to address certain things, like the beauty of the mundane."

Matthew Bax is at Uber Gallery, St Kilda, until March 24.