

Fractal Expressionism

Richard Taylor





Blue Poles, 1952 (Australian National Gallery)

Jack the Dripper

Was Jackson Pollock The Greatest American Painter of the Twentieth Century?

In a drunken, suicidal state on a stormy night, Jackson Pollock (1912-56) started his masterpiece *Blue Poles* (above) by rolling a large canvas across the floor of his wind swept barn and dripping paint from an old can with a wooden stick. This deceptively simple act fuelled unprecedented controversy and polarised public opinion. Was this primitive painting style driven by raw genius or was he simply a drunk who mocked artistic traditions? Twenty years later, the Australian government rekindled the controversy by purchasing the painting for a spectacular \$2 million. Only works by Rembrandt, Velázquez and da Vinci had commanded more respect in the art



market. Pollock's brash and energetic works continue to grab attention, as witnessed by recent retrospectives where price tags of \$40 million were discussed for *Blue Poles*. Pollock shot to fame in 1949 when *Life* magazine asked, "Is He the Greatest Living Painter in the United States?" A photograph of Pollock glared out defiantly from the page, a cigarette dangling provocatively from his lips. In those pre-television days, a color spread in *Life* was a moment of national significance. One year later, Pollock's artistic style was captured for posterity on film. By then, the public spotlight had reached unbearable brightness and Pollock descended into self-destructive alcoholism. The filming is seen by many as the day on which his downward spiral began. Pollock's story ended after a drunken binge in August 1956, when he died in a high-speed car-crash. He died with only \$350 to his name.

Aside from the commercialism and mythology, what meaning do Pollock's swirling patterns of paint really have and what was his role in generating them? Art theorists now recognise his patterns as a revolutionary approach to aesthetics. In an era characterised by radical advances in art, his work is seen as a crucial development. However, despite the millions of words written on Pollock, the precise quality which defines his unique patterns never has been identified. More generally, although abstract art is hailed as a modern way of portraying life, the public remains unclear about how a painting such as *Blue Poles* shows anything obvious about the world they live in.

The one thing which is agreed upon is that Pollock's motivations and achievements were vastly different from those associated with traditional artistic composition. His drip paintings eliminated anything that previously might have been recognised as 'composition'; the idea of having a top and bottom, of having a left and right, and of having a centre of focus. Pollock's defence was that he had adopted a "direct" approach to the expression of the world around him, concluding that "the modern painter cannot express this age, the airplane, the atom bomb, the radio, in the old form of the Renaissance, each age finds its own technique."

SPLASHDOWN

After fifty years of debate, the answer to Modern Art's greatest question has been delivered from an unexpected source - science.



In 1999, Professor Richard Taylor and his research team published the results of their scientific analysis that showed Pollock's dripped patterns to be fractal. Fractals consist of patterns which recur at finer and finer magnifications, building up shapes of immense complexity. Significantly, fractals are the basic building blocks of nature's scenery (for example, lightning, clouds, mountains and trees), earning the fractal the dramatic title of "the fingerprint of God". The eye-catching intricacy of even the most common fractal patterns, such as the tree shown in the left-hand figure, contrasts sharply with the simplicity of traditional man-made shapes such as circles, triangles and squares.

The identification of fractals within his infamous swirls of dripped paint completely rewrites the Pollock story.

Christened by Taylor as "Fractal Expressionism," Pollock distilled the essence of natural scenery and expressed it on his canvases with an unmatched directness. By adopting nature's pattern generation processes, the resulting paintings didn't mimic nature but instead stood as examples of nature. The figures below compare Pollock's fractals to those found in nature. Remarkably, the analysis revealed a highly systematic fractal painting process perfected by Pollock over ten years.

Although the fractal tree patterns observed at different magnifications don't repeat exactly, they have similar visual characteristics.

Taylor's discovery of Fractal Expressionism was greeted with considerable enthusiasm from the press, the public, and the scientific and artistic communities. A thirty minute documentary on his results was broadcast on national television in Australia (the homeland of Pollock's most controversial work *Blue Poles*). He received invitations from the Nobel Foundation, national galleries and museums to give lectures on his work and he gave radio interviews for international arts and science programs. He was commissioned to write articles for popular science magazines such as *New Scientist*, *Physics World* and *Scientific American* and his discovery featured in a range of other magazines including *Nature*, *Science*, *Leonardo*, *Discover* and national newspapers around the world.

Like a domino effect, the discovery raised more questions than it answered, with implications stretching well beyond that of Pollock and art.

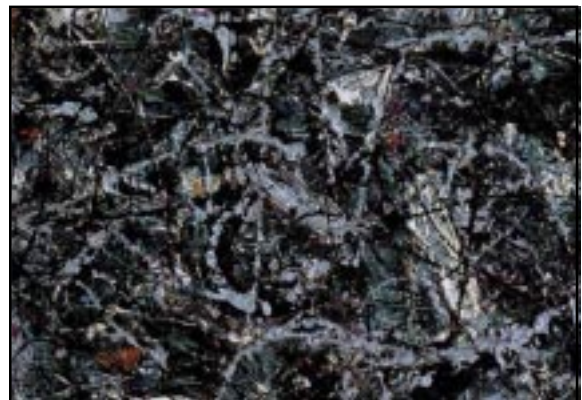
Taylor's work triggered inquiries from a diverse range of people. With paintings valued at over \$40 million, art galleries wanted to explore the technique's potential to authenticate Pollock's work. Art lovers wanted to know more about fractals and Pollock's painting style. Art theorists pondered the use of scientific objectivity to understand art. Psychologists were intrigued about how a human creates such intricate natural patterns - no one had achieved such a feat before! Architects wanted to learn of human responses to the aesthetics of fractal objects. Scientists and physicians were interested in analysis techniques applicable to fractals within biological systems.



Tree roots



Number 32 (1950)

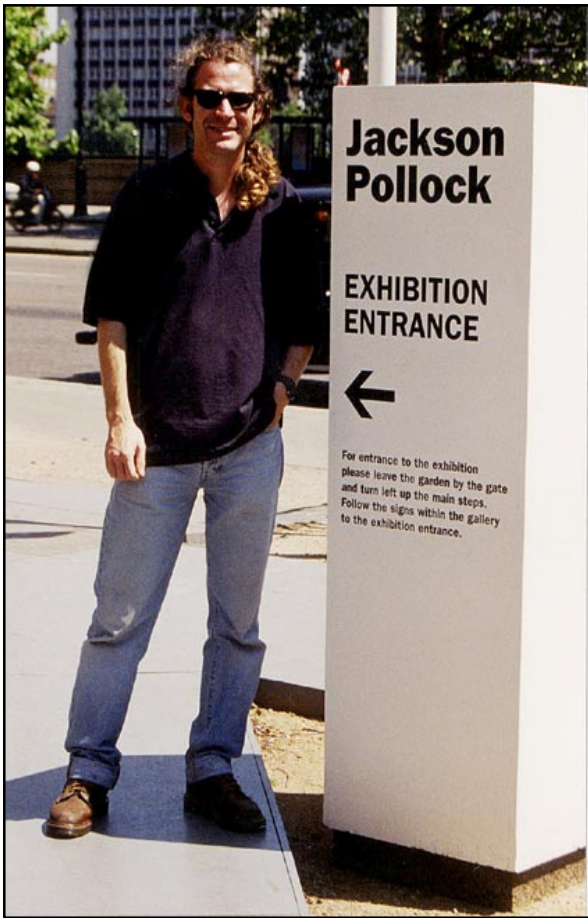


Full Fathom Five (1947)



Seaweed

Further Information



Richard Taylor at the Tate Gallery

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Publications

1. 'Jack The Dropper' *Physics World*, November edition, p76 (1997)
2. 'The Art Of Science' Broadcast by the Australian Broadcasting Corporation (1998)
3. 'Splashdown' *New Scientist*, no 2144, p30 (1998)
4. 'The Story Of A Chaotic Pendulum: Where Science And Art Meet' *The Physicist*, vol 36, no 3, p93 (1999)
5. 'Fractal Analysis Of Pollock's Drip Paintings' *Nature*, vol 399, p422 (1999)
6. 'Fractal Expressionism' *Physics World*, vol 12, no 10, p25 (1999)
7. 'Fractal Expressionism – Where Art Meets Science' *Art And Complexity*, Ed. J. Casti, Perseus Press
8. 'The Use Of Science To Investigate Jackson Pollock's Drip Paintings,' *Art And The Brain*, Journal of Consciousness Studies, vol 7, no 8-9, p137 (2000)
9. 'Authenticating Art With Nature's Geometry' in press *Scientific American*
10. 'The Construction of Fractal Drip Paintings' in press *Leonardo*

Credits

'Blue Poles' (Australian National Gallery)
Photograph of Jackson Pollock (Arnold Newman)
'Number 32' (Kunstsammlung Nordrhein-Westfalen)
'Full Fathom Five' (Museum of Modern Art)
Photograph of Jackson Pollock below (Hans Namuth)
Photographs of natural scenery (Richard Taylor)

