Stilled splashes

The physicist Arthur Worthington was intrigued by the beauty to be found in photographs of splashes produced when bodies of various shapes and sizes fall into fluids. The legacy of his enthusiasm is with us today.

Martin Kemp

Some of the images made visible by modern science are at once so arresting and so beautiful that they have come to be regarded as supremely representative of natural forms and processes. The momentary coronet of the splash made by a spherical object plunging into a pool of milk has entered general consciousness to such effect that it serves as the logo of Milk Marque, the British company that replaced the Milk Marketing Board in 1994 and which is responsible for distributing more than 6 billion litres of milk per year.

The unexpected and wonderfully complex configurations of 'simple' splashes were first revealed in 1908 by Arthur Worthington, professor of physics at the Royal Naval Engineering College in Devonport, where research into the behaviour of water and the dynamics of projectiles was of obvious relevance.

Worthington's *A Study of Splashes* and his photographic montages, now in the National Museum of Photography, Film and Television in Bradford, are under-recognized classics of scientific photography. Each fleeting phase in splashes formed by falling bodies of various kinds and sizes was effectively stilled in the light of a spark lasting less than three millionths of a second. Sets of splashes formed under identical conditions were successively photographed by a plate camera with uncovered lens in a darkroom, with each successive splash captured at an interval of around one hundredth of a second later than its predecessor — on the assumption that each splash passes through essentially the same sequence of phases.

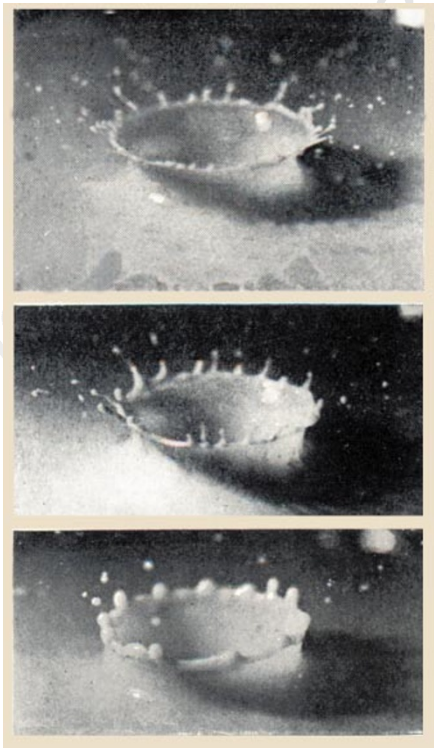
Worthington was justifiably excited by the "exquisite forms the camera has revealed". On one hand, the beguiling sequence of fluid configurations appears "orderly and inevitable", while on the other, "it taxes the highest mathematical powers to elucidate", requiring a precise knowledge of "the real path of any particle".

The sensitivity of the process to its initial conditions was confirmed when smooth and rough spheres of identical dimensions and weight were shown to generate quite different shapes, one more crater-like and the other more roundly protuberant. We now understand that the necessary 'mathematical powers' to model such dynamic systems reside in computer-driven chaos theory rather than with the analytical tools available at the turn of the century.

Although Worthington's experiments were drawn into a wider arena by their illustration in D'Arcy Thompson's *On Growth and Form* in 1917, in which the Scottish biologist characteristically intuits morphological analogies with medusoids and hydroid polyps, Worthington's pioneering work was later submerged by the entrepreneurial flair of Harold Edgerton at MIT's 'Strobe Alley' during the 1930s.

Edgerton so perfected his stroboscopic system that it could deliver 3,000 images per second. Alert to the commercial potential of such striking photographs as that of a bullet passing through an apple, Edgerton vigorously promoted his pictures to the public, not least through his 1939 book *Flash* and his film *Quicker 'n a Wink*. It was one of Edgerton's spectacularly well-defined prints of the splash coronet that was accorded pride of place in Thompson's 1948 revision of his classic text, and, in its luridly coloured 1957 version, that entered the collections of museums, adorned posters and sold postcards.

In selecting a tidied-up graphic version of the milk coronet, seen by implication from below rather than looking down on the surface, Milk Marque is clearly relying upon our ability to see both the regal crown and the photographic splash, exploiting our receptiveness to visual puns. Seeing the splash makes more demands on us than seeing the stock icon of the crown, and it transpires that, famous though the Worthington–Edgerton image has become, not everyone picks up the ingenious allusion to the stilled splash in the logo that is familiar on the roads of Britain. □



Arthur Worthington's "The splash of a sphere" from *A Study of Splashes* (Longmans, Green, 1908).

A Milk Marque tanker showing the familiar 'splash of milk' logo.

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