

## Moving Targets

For her previous exhibition, 'The Pigeon Archive', Lyndall Phelps explored the role that pigeons played in military communications in the First and Second World Wars. Phelps's work reconstructed the methods used to exploit the pigeon's natural characteristics – its ubiquity, its relationship with humans, its powers of endurance and its homing instinct. Carrier pigeons have had canisters strapped to their backs, been wrapped and bound for dropping from aircraft and have had miniature parachutes attached to them. Pigeons are generally regarded with loathing, but when they are performing heroic long-distance flights with vital messages, or competing for racing glory in civilian competitions, they provoke intense human empathy. We even go so far as to award them medals, while sacrificing them in vast numbers for our own ends.

It was while conducting research on pigeons at various small airfield museums in East Anglia in 2006 that Phelps came across examples of chaff, a countermeasure for radar. Chaff is aluminium foil or paper coated with aluminium to reduce weight, cut into strips of varying lengths depending on the radar frequency being used. The strips are usually gathered into bundles and thrown or ejected from aircraft, creating a cloud of false echoes which appears as a cluster of secondary targets on radar screens. Invented almost simultaneously by the British<sup>1</sup> and Germans during the Second World War, chaff is far from being a redundant technology: new materials, packaging methods and dispensing techniques have been developed since 1942 and it continues to be a key means of defence for modern combat aircraft and naval vessels against radar-guided missiles.

'Softkill' – not a made-up title but the word used to describe countermeasures that confuse an incoming missile by means of decoys, smoke and electro-optical signals, infrared or laser jamming - is a further development of Phelps' long-standing interest in science, natural history, war and militaria. The irony of war is that it has often been the stimulus for new developments in technology and medicine which benefit society at large. The origins of the computer lie in the Second World War, and medical examples are legion, from the treatment of burns to emergency surgery. Conversely, most civilian inventions, from Teflon to carbon fibre, the internet to the laser, and even radar itself, are equally applicable to military contexts. Phelps has been working with two scientists at Cranfield University who have developed a radar unit for a large defence company which is designed to detect humans trespassing in unauthorised areas. Recently, the radar unit has been adapted to help natural scientists, as they attempt to monitor the decline of biodiversity or to identify and track species such as otters. Phelps herself has a particular interest in badgers, another species whose behaviour excites lively debate between conservationists on the one hand and the advocates of a 'controlled cull' on the other.

Phelps's new work foregrounds precisely this duality in the nature of human invention. Her fictional scenarios have a darker side, hinting at loss, vulnerability and our manipulation of the natural world. The furred and feathered creatures for whom she has designed individual radar countermeasures are of the kind that are regarded with suspicion or hostility, or at best with

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<sup>1</sup> The British physicist R. V. Jones was the first to suggest that pieces of metal foil falling through the air might create false radar echoes. In 1942 the idea was developed by Joan Curran, the only woman scientist at the Telecommunications Research Establishment. The RAF first used chaff as a countermeasure in July 1943 in the attack on Hamburg. It was hideously successful: the city was devastated but only 12 aircraft were lost.

ambivalence. Magpie, jackdaw, kestrel, fox, grey squirrel, badger, they are the non-conformists of the wild, the outlaws in an increasingly urban and closely monitored society. Whether hustlers for food in broad daylight or ruthless night-time foragers, they have been equipped by the artist with chaff to scatter in the path of their enemies. The design of the chaff is appropriate to the behavioural characteristics of each species; for example the kestrel has a parachute from which are suspended miniature reels of tin foil, a type of countermeasure that Phelps discovered in one of the small military museums that she visited in the course of her research. As the parachute descended, the reels would unravel, creating a curtain of streamers in the sky that would deflect the radar beam.

The invisible though not inaudible element in 'Softkill' is radar itself. Radar is designed to detect moving targets and to measure the target's speed, but how it works is difficult to summarise in such a short text as this. Radio Detection and Ranging - an appropriately palindromic word, as Chamber's Dictionary points out - continuously transmits a low-power microwave signal so that its reflections are continuously received. When the microwave signal is reflected by a moving target, its intensity increases if it is moving towards the radar unit and decreases if it is moving away, thus producing the Doppler effect, a sound audible to the human ear that is the difference between the received and the transmitted frequency. This sound is in effect the sound of movement, and due to the complexity of human and animal movement - the feet move faster than the hips, a bird's wings move faster than the rest of its body - a signal is produced with a variety of notes and volumes. Sounds produced by peregrine falcons, pigeons, badgers, foxes and deer have been recorded and are played back in the projection space where the badger and its countermeasure are located. In addition, Phelps has produced photographs and drawings which graphically represent movement through the radar beam; as such they are also a graphic representation of the sounds themselves.

The taxidermy specimens of Phelps's chosen species have been specially commissioned from a taxidermist or borrowed from museum collections, but in keeping with her usual practice the other elements of her exhibition have been meticulously handmade, either by herself or in the case of the storage vessels for the individual countermeasures, in collaboration with a woodwork enthusiast. The storage vessels simulate the nest boxes and feeding stations that we place in the environment for the benefit of wildlife, usually for species that we want to protect or observe for our own pleasure.

'Softkill' - itself such a threatening and conflicted word - explores the potential for both positive and negative outcomes promised by radar's encroachment into the arena of natural history. How we respond rather depends on which side of the fence we're on.

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