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Heathrow, Sacred Flight Path: Aircraft Landing Gear and the Politics of Global Transfer

Abstract

The landing gear compartments of long-haul aircraft point to the politics of global transfer. Those of planes arriving at London Heathrow are vessels in which seeds, spores, soil particles, bacteria, insects, and even people are brought to the UK from far flung places.

This paper presents on a research project that seeks to think the agency of the wheel bay in an ecology of struggle in Heathrow airspace. The research operates within the registers of art practice, and is informed by materialist philosophies, spatial theory and forensic science. Beginning with a microstratigraphic survey of a Boeing 777 wheel-bay on stand in the UK, it examines the wheel-bay's role as a vessel that determines, conditions, and organises matter that is in the air, and hence, the matter of air in both senses. It explores too its role as expository instrument, as far as it makes available for inspection the politics inscribed into its formal, spatial, and temporal configuration. The paper argues that the wheel bay gives shape to a set of otherwise intangible aeromobilities, knowledge of which is integral to a nuanced understanding of the political geography of airspace at London Heathrow.

Keywords: Heathrow; political geography of air; aeromobilities; micro-stratigraphy; wheel-bay

Note: The images are not included in this transcript.

In a short article on plant pathology published in 1981, the aphid specialist HLG Stroyan speculated that aphids found at Kew Gardens had fallen from the landing gear of an aircraft. The plane was bound for London Heathrow and had flown from the US state of California. The inference was that the aphids, *maro siphus albi frons,* [Fig. 1] had stowed away in the wheel bay, the cavity into which the aircraft's wheels retract during flight, and had tumbled out into the temperate air above the botanical garden when the landing gear was extended in preparation for arrival. Had I been one of those aphids, I would surely have breathed a sigh of relief.

Many elements of struggle are contained in this story. There is the aphids' bid for survival in the hostile conditions of the wheel bay airspace, not least the severe cold and shortage of oxygen. There is the battle of Kew's botanists against Californian aphids, which is, in turn part of a wider fight against the encroachment of nature. An ordered nature over and against an unruly one; a human construction of nature as opposed to its realist, if not essentialist, counterpart. There is too a conflict of interests. For many of Kew's plants are flown in by air and for free, courtesy of Heathrow Airport Holdings Limited. It is not impossible that the aphids arrived on the same flight as cargo plants. Where should Kew draw the line between a commitment to botanical research and corporate environmental responsibility?

Also implicit in the story is the agency of the vehicle. The wheel bay provided the aphids with a means by which to travel in clandestine fashion, as well as to board and alight from the aircraft without recourse to the terminal gate. To this extent, the wheel bay served as both an inside and an outside. An inside, in the sense of a space safely encapsulated within the plane. An outside, in the sense of a space beyond the regulatory system of customs and immigration. We may deduce that this unusual configuration was a significant contextual element in the shaping of the struggles noted so far. Hence, if we are to understand them more fully, then we will need to know more about the wheel bay. In the same way that a groom might examine the latch and hinge of the gate from which the proverbial horse has bolted, we should take a good look at the wheel bay's form. Inspect its design, surfaces and mechanism. Extrapolate, and think these 'thingly' qualities in relation to the philosophical problems to which they point: the seen and unseen, the permitted and forbidden, trouble and hope.

The story's protagonists are mere aphids. Yet, to the reader whose imagination is prey to the allegorical impulse, aphids are not easily taken at face value. Inscribed in Stroyan's speculations would seem to be an account of the global transfer of the systemically illegitimate, the unrepresented, and possibly the un-representable. The wheel bay is not designed as a cabin or even a hold, and so that which finds itself inside, whether by accident or design, is not thought in relation to quantification, if it is 'thought' at all. It is hard to believe that, had they come to settle somewhere other than in the gardens at Kew, the aphids would have been discovered, let alone caught the attention of those empowered to classify them.

In the summer of 2019, the UK media ran two stories on people who had fallen from planes. The first was about a man who on 2nd July had fallen to his death from the wheel bay of Kenya Airways flight KQ 100 from Nairobi to London. The second was about a woman who on July 25 had fallen to her death from a light aircraft over Madagascar. The contrast between the stories could not have been more pronounced. In the first, the victim was not named and the account focused on the fact that the falling body had inconvenienced an Oxford graduate sunbathing in his back garden in Clapham. It had narrowly missed him and broken two of his patio slabs.

The second victim was a 19-year-old British woman, Alana Cutland, an undergraduate at Cambridge. The story is still running. According to the CAA there have been 7 reported cases of people falling from wheel wells over London and 113 been reported globally since 1947, with the incidents steadily increasing within the last 10 years. But many airports are in isolated parts of the countryside or on the coast. When frozen bodies fall out, they are not always spotted or discovered, so the numbers are likely to be considerably higher.

So, how might agency, empirical mass, realism and representation be granted to the systemically illegitimate and the vagaries of the unseen and un-experienced? What else, might be travelling to Heathrow unseen in the aircraft wheel-bay? And what might it tell us about the role of the wheel bay in global transfer?

What follows is a brief overview of an interdisciplinary, mixed methods research project that seeks to think the agency of the wheel bay. It was begun in 2018 and will culminate in a cluster of artworks for exhibition in late 2019. The project draws on qualitative data of narrative and hearsay, on architectural techniques of modelling, on data collection by

means of forensic science, on spatial and materialist theory, and on cultural references that inform art. The objective is to initiate a process of de-abstraction – of making apparent – by giving the wheel bay real-time experience. To this end, a model wheel bay of a long-haul aircraft is to be rebuilt in the gallery on a scale large enough to evoke the original, and images from a forensic examination of the micro-stratigraphy of the original will be exhibited alongside.[1] The work, titled *Capsule*, will incorporated into an exhibition, *Air Matters*, hosted later this year by Watermans Arts Centre, Hounslow, a venue across the river from Kew, and which also lies under the Heathrow flight path.

Mapping the wheel bay space

There are on Google Images surprisingly few photographs of 777 wheel-bays. There are numerous images of landing gear photographed by aircraft enthusiasts as the planes zoom over, but the cavities into which they retract are invariably grainy, gloomy, and formally inconclusive.

The process of searching for images of a wheel bay is complicated by the fact that in the English language, at least, the wheel bay has no decisive name. In the media it is often called the landing gear compartment. In blogs posted by the enthusiasts it is sometimes called the wheel *well*, at others the wheel bay. The name 'well' is suggestive of a vessel and invokes folkloric hope that benevolent deities might be housed inside. It points also to a sedimentary capacity, and to the possibility of things being lost or discarded within it. Wheel *bay* is the more widely used of the two terms and indicative of an allocated space, in this case the aircraft wheels. It would suggest that contents other than the aircraft wheels do not belong or, to borrow a phrase from the anthropologist Mary Douglas, they are 'matter out of place' (Douglas, M. Purity and Danger).

There are, to my knowledge, no technical drawings of the Boeing 777 wheel bay. After agreeing to help with my search, a fluid mechanics engineer at the National Physics Laboratory (NPL) drew a blank on the diagram databases which she regularly used for aeronautics projects. A patent attorney with experience of locating rival patent claims ran into a similar difficulty. He found drawings of wing flaps, landing gear, hydraulics, brakes,

[1] The forensic report has been drawn up by Dr Andreas Hahn at the Department of Earth Sciences, Kingston University.

tyres, but not wheel bays. The problem, he explained in the pub one evening, lay in the fact that the wheel bay is not an invention. It can't be an invention because it isn't a *thing.* It was at this point I realised I might be onto something. The sociologist Bruno Latour famously asked how 'matters of concern' (2003) might be constructed in the absence of the Thingly. However, the agency of the wheel bay suggests that Latour's materialist philosophy should be extended to include non-things. The question might be reformulated: "How might matters of concern be constructed in the absence of the non-thing?"

As it happens, the wheel bay would seem to promise a valuable capability precisely by virtue of its 'non-thing' status. For as the micro historian Carlo Ginsberg has shown us, if you want to establish truth, you need to look in the places that people have not thought to construct or conceal it. An unauthored gap between extraordinary feats of engineering, the wheel bay is not conceived of for semantic scrutiny and no message is consciously planted there. It is the counterpoint to the tailfin emblazoned with national or corporate livery. It is a gap, a space off its guard, and the engineering equivalent to an ear or toe in a forged masterpiece.[2]

My quest took me to an aircraft boneyard in the Cotswolds, England, where on March 15, 2019, I was able to inspect and measure up the wheel-bay of Ethiad Airways Boeing 777-200LR A6-LRC [Fig.] The cavity in which I found myself was shaped like a letter P turned clockwise through 90 degrees as if the letter were lying on its back. [Fig].The largest section (the head of the letter P) formed a room of about 40 m3. Running the length of the room's inside edge (the edge furthest from the wing tip and forming the top edge of the rotated letter P), there was a ledge 38.5 cm deep. It was 2.8m high and was compartmentalised into 8 roughly equal spaces by a series of vertical struts. The part that lies under the wing was highly irregular in shape, its top and bottom curving to fulfil the aerodynamic requirements of the upper and lower surfaces of the wing.

The walls were lined with a yellowish sludge, about 1/4 mm thick, considerably more in some places.

[2] See: Ginsberg. C. 1980. Morelli, Freud And Sherlock Holmes: Clues And Scientific Method Carlo Ginzburg and Anna Davin. *History Workshop* No. 9 (Spring, 1980), pp. 5-36

[Fig].

The sludge would be central to the micro-stratigraphic survey. Using, first, cut lengths of Sellotape, the sludge was sampled by sticking them to the surface, peeling them off and setting them aside in Tupperware boxes. This technique was supported with a second, whereby material was scraped from the surface. A university staff card proved the best-designed instrument.

[Fig.]

Inside the wheel bay, my mind returned to the aphid story. As the plane had stood on the sweating Californian tarmac, or as it gathered speed for take-off, the aphids would have found themselves drawn up by the moving air and driven or sucked inside where, as the undercarriage retracted and the hydraulic doors closed, they were temporarily housed. Accompanying them would have been the air on which they rode, as well as other airborne matter – moisture, particles of dust, spores, insects, seeds, bacteria. In short, wheel bays function as a kind of capsule in which matter is collected, sealed in and transported to far flung locations. The process invoked a short essay on entropy by the American land artist Robert Smithson, in which he describes the activity of a child in a sand box: [fig.]

> Picture in your mind's eye the sand box divided in half with black sand on one side and white sand on the other. We take a child and have him run hundreds of times clockwise in the box until the sand gets mixed and begins to turn grey; after that we have him run anti-clockwise, but the result will not be a restoration of the original division but a greater degree of greyness and an increase of entropy (Smithson. 74).

I was also able to satisfy technical aspects of questions around the plight of stowaways. [Fig] There is room enough for a fugitive, but the spot in which to hide would have to be chosen carefully if you were to avoid being crushed by the landing gear. You'd need to get on the shelf where the hydraulic fluids are stored, or in an alcove [Fig]. but you would not discover this until the landing gear was retracting, by which time it would be too late to move. The chances of a terrified, adrenalin-fuelled refugee working all this out in the hours of darkness

were slim indeed. I also laid to rest a myth that abounds among would be refugees. There is no secret door to the cabin.

Working from measurements taken in the wheel bay, I have been able to digitally model the wheel bay cavity.

[Fig. video]

[Fig.]

Until the physical model is built and exhibited, it will not have had the chance to assume its role as experiential space for other visitors. The conversations that it promises to prompt have not yet taken place. For that, you will need to attend the exhibition and symposium.

I *have* received most of the forensic report, and there is just enough time to draw attention to three of the findings [Figs].

1. Mafic and felsic minerals. There is a dominance of sub rounded grains, speaking against a predominance of aeolian materials such as desert sands.
2. Podo carupus Pollen [Figs.]

This is widely distributed in the tropics and sub tropics across: Africa, Asia, Australia, Central and South America and several South Pacific islands

3. Glass beads. [Fig.]

Glass beads. These caused the forensics people some difficulty. They were not organic matter, so did not fall under the remit of the people who dealt with this. Neither were they soils, so they didn't come under earth sciences. Finally recognised as the reflective agent in airport pavement striping such as that used on runways.

[Fig.]

[Fig. Still of wheel bay model]

These findings point to the wheel bay of a long-haul aircraft as a complex site of material fusion. With each location the plane visits in its 10 to 15-year lifespan, organic material and minerals are gathered into the cavity, sticking to its surfaces to form what John Ruskin once called a "time-stain" (1865). In the present context, it might more usefully be thought of as a place stain, a record not just of the time to which it belongs, but of the visited locations. Thus, the wheel bay is rendered a uniquely-articulated environment and indeed, if sat in a

wheel bay one might well be prompted to ask how the category of place would stand up philosophically if required to accommodate the material evidence of one's location.

It points too to its function as an instrument of global transfer, one that redistributes matter irreversibly and contributing to the formation of a new geographical entity to be found in the vicinity of airports. With time, the flow of planes into Heathrow deposit matter along their course. The analogy of the river may be useful in comprehending this, because what is being produced is a new sedimentary layer that starts at about 5 km from the airport, the point at which the landing gear is opened, and becomes steadily more concentrated towards the runway. In his book Thames, Sacred River, Peter Ackroyd notes "The river contains its beginning within its end" (2008:17). The same may be said of the flight path. In the absence of geographical features, this is for the most part detectible only at the forensic level but with time the bacteria, insects, soils and spores which fall from the landing gear compartments of arriving planes promise to produce a new kind of planetary garden. Since 2006 the Western corn rootworm, *dia brotica virgi fera*, now widely found in the vicinity of European airports but indigenous to North America, is reported to be "eating the Queen's corn crops at Windsor" UK Gov. 2006). As the balls of glass within this new landscape multiply, it is becoming gradually more reflective. Perhaps one night it will even come to guide observers of the Anthropocene to the sites where Heathrow's runways once lay.

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