SURVEYS AND SPECULATIONS

# Accelerating modernity

## Time–space compression in the wake of the aeroplane

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It is not easy to get a firm grip on the concept of modernity. Moreover it is probably not a very modern gesture, to follow Charles Baudelaire's classic definition, and identify the modern by its transient and fleeting character. Yet, in the prevailing tangle of attributes defining modernity, one stands out as especially interesting to historians of transport. In the last decades the modern quest for speed – the idealisation as well as the actual manifestations of acceleration in the nineteenth and twentieth centuries – has come to play a significant role in the definition of modernity as a historical epoch. This focus on speed has led to the idea that the invention of mechanical vehicles marked the rise of modern society. Contrary to movement stemming from the legs of humans or animals, machine-based transport could be accelerated, seemingly, without limit. According to this theory, modernity originates in the mechanical ability to speed movement up, because the subsequent acceleration of transport and information affects the basic categories of time and space or, to be more precise, it distorts the pre-modern stability of the relationship between time and space.

Thus, in *Liquid Modernity*, the sociologist Zygmunt Bauman offers an account of the rise of modern society based on acceleration and the resulting ability to manipulate time: 'History of time began with modernity. Indeed, modernity is, apart from anything else, perhaps even more than anything else, history of time.' Time acquires history, Bauman argues, once the speed of movement becomes a matter of technology. From this point on 'all extant, inherited limits to the speed of movement could be in principle transgressed. Only the sky (or, as it transpired later, the speed of light) was now the limit, and modernity was one continuous, unstoppable and fast accelerating effort to reach it.'[1]

In this way the fleeting and transitory character of modernity can be linked with the increasingly swift circulation of goods, information, capital and people. Baudelaire's modernism – the idealisation of the transient and the pursuit of the new and 'modern' – is coupled with a will to go ever faster. In this respect one could argue that the development of mechanical means of transport has not only responded to a practical need for shortening distances, it has also been a prerequisite for conceiving and 'performing' the idea of the modern.

Historians of transport may applaud Bauman's view of modernity, seeing in it a recognition and confirmation of the central position of their field of research. While historical studies can verify the claim that the development of mechanical vehicles has had a crucial effect on the formation of modern society, also the quest for speed has been used by historians to describe the aim and effect of multitudes of inventions in their accounts of modern transport development. Bauman's record, in other words, may be nicely aligned with the narratives of transport history. Even so, the pursuit of speed is often held within a descriptive realm in historical studies, while sociologists often analyse modernity in broad terms. In both instances, the purpose of modern acceleration remains vague, and there is a tendency to let the arguments run in a tautological circle. On the one hand, Bauman, in his generalising form, accounts for the quest for speed and the haste of modern life by referring to the innovation and ongoing acceleration of the mechanical means of transport. On the other hand, historians of transport frequently use the quest for speed as an unproblematic, causal explanation or motivational factor in historical narratives of technological progress. Hence the social ideal of acceleration is explained by technological capacity, while the technological development of faster vehicles is accounted for by elusive references to the modern need for speed. What, however, were the values and specific meanings of speed in modern society?

A focus on speed offers common ground for intellectual exchange and dialogue among scholars of modernity and transport studies. To perform that role, though, speed needs to be wrested out of its hypostatised state, first by studying the differing perspectives on velocity in the historical sources and second by breaking up the linear narrative of speed and acceleration. Though the numerical speed of vehicles may have shown a more or less straight-line progression since the invention of the railroads, past conceptions of speed during the same period have not. In other words, the 'reality effects' of acceleration during the modern period, or the social construction of speed in the nineteenth and twentieth centuries, should not be framed as an evolutionary story.

In this article I attempt to 'unstraighten' the path of speed by following the trail of the aeroplane. I do so by exploring the ways the aeroplane has been perceived by two significant representatives of modernity: first, the Italian avant-garde movement, Futurism, in the 1910s, and its conception of the flying machine and its effects, and, second, the Swiss architect Le Corbusier's view of the aeroplane in the 1920s and 1930s in light of his functionalist ideas. Both the Futurists and Le Corbusier were influential in defining what was modern about modern society or, rather, what was *passé* and what should be done in order to create a truly modern world. They both confirmed the key role played by transport technologies – notably aeroplanes and automobiles – in establishing modernity, even if they reached quite different conclusions as to what that role implied. Focusing on its temporal and spatial implications, the speed of the aeroplane led the Futurists to proclaim the destabilisation and annihilation of time and space as the core of modernity.

A decade later, Le Corbusier reached the opposite conclusion as he celebrated the flying machine's stabilising effects, its objective 'supervision' of the world underneath and its incarnation of the functionalist ideal of the straight line.

In view of these alternating discursive strategies linking flight, speed and modernity, this article argues against the somewhat hyperbolic claims of the time–space compression narrative. This narrative represents the idea that acceleration has continuously compressed time and space throughout modernity, reaching a final annihilation of temporal and spatial co-ordinates in the present society of instantaneous electronic communications, which defines the 'postmodern condition' of today. Besides the fact that the 'annihilation of time and space' has been declared as long ago as the nineteenth century, I will suggest that the technologies of speed led to far more differentiated strategies of the organisation of time and space than the time–space compression story proposes. Rather than continuously compressing and finally annihilating time and space, speed has produced diverse and interacting, occasionally conflicting, times and spaces. It is this production, or what I will call the 'timing' and 'spacing' of aeroplane speed in the early twentieth century, that this article investigates.[2]

## Speed and time–space compression: framing modernity

As the twentieth century approached, the fast pace of life was widely noted as the most distinctive feature of the age. But why were the new fast vehicles – cars, ocean liners, motor cycles and aeroplanes – received with such great enthusiasm? The economic incentive to reduce turnover time and accumulate capital has been a prominent explanation of the need for modern acceleration. Since Benjamin Franklin famously stated that 'time is money' in 1748 the matter seemed only to grow in importance and embrace broader segments of society as 'scientific management' came to the fore in industry and numerous other aspects of social life around 1900. But, besides its economic advantages, speed had multiple other attractions and connotations in the modern era. It was promoted for reasons of military control in colonial discourses and glorified in revolutionary rhetoric to speed up the utopian promises of the new society to come. In the United States speed was even endorsed as a personal moral virtue. As Protestants preached towards the end of the nineteenth century, rapidity should be pursued to make 'wise use of God-given time.'[3]

The acceleration caused by the mechanisation of transport and communication changed not only the pace of life but ways of living as well.

> Those people who today make use of the telegraph, the telephone, the phonograph, the train, the bicycle, the motor cycle, the automobile, the ocean liner, the dirigible, the aeroplane, the cinema, the great newspaper . . . do not realise that these various means of communication, transportation and information have a decisive influence on their psyches,

wrote Filippo Tommaso Marinetti, founder and leader of the Italian Futurism movement, in 1913.[4]

Speed, the Futurists thought, had far-reaching cultural and political implications. It allowed an ordinary man to travel in one day's time from 'a little dead town' to a capital city 'bristling with lights, gestures and street cries'. Fast communication also was a potent source of change: 'By reading a newspaper the inhabitant of a mountain village can tremble each day with anxiety, following insurrection in China, the London and New York suffragettes . . . and the heroic dog-sleds of polar explorers.'[5]

For Marinetti, mechanised speed had produced 'significant phenomena' such as:

1 Acceleration of life to today's swift pace. . . .
2 Dread of the old and the known. Love of the new and the unexpected.
3 Dread of quiet living, love of danger, and an attitude of daily heroism.

Among these new phenomena induced by acceleration we also find semi-equality between men and women, a modification of patriotism and of the idea of war, passion for business, sport and records, a new mechanical sensibility, a fusion of human instinct with the efficiency of motors, a new tourist sensibility, a '[l]oathing of curved lines, spirals, and the tourniquet. Love for the straight line and the tunnel,' and 'visual foreshortening and visual synthesis caused by the speed of trains and cars'.[6]

The list goes on, but these varied aspects should suffice to show that the Futurists had a broader take on accelerated transport and communication than mere economic incentive or the simple technological ability to go faster. Though the Futurist specification is a special case, the cultural implications of speed can be acknowledged.

This article focuses on the temporal and spatial effects of acceleration, some of which are suggested by the Futurist list quoted above. Accelerating technologies created radical changes not only by moving bodies and information, but also by altering perceptions of the physical layout of the world and its temporal organisation. One could argue that what makes speed so pervasive and capricious is its effect on the basic categories of time and space. If the time needed to traverse space units can be endlessly reduced through the use of mechanical means of transport, then not only does the relation between time and space become fluid but also the categories themselves disintegrate. In other words, time and space were torn out of their Newtonian stability during the modern period. Time become 'historical', as Bauman notes, but, by the same token, space became variable as it diminished and 'succumbed' to the 'conquering' technologies of speed.

Sources abound supporting the view that time and space became elastic phenomena in modern society. Stephen Kern has documented how space was thought to shrink and time seemed to shorten in the late nineteenth century.[7] The railways were described in similar vein half a century earlier, as Wolfgang Schivelbusch has shown. Travelling at an average speed of 40 km per

hour, trains were expected to cause 'the gradual annihilation, approaching almost to the final extinction, of that space and those distances which have hitherto been supposed unalterably to separate the various nations of the globe', as one journal put it in 1839.[8] When the aeroplane arrived at the beginning of the twentieth century its effects were also routinely described as the annihilation of time and space.

The advent of the aeroplane marks neither the beginning nor the end of the modern process of acceleration, but it was generally seen as the most 'futuristic' artefact during the first half of the twentieth century. It was a forerunner among the many new technologies that were thought to give rise to a high-speed modern society – 'a joyous machine civilisation', as it was called. From its invention in 1903 the heavier-than-air flying machine moved relatively slowly to the centre stage of technological wonders, but once it did reach that point, around 1909, it held its symbolic hegemony through until the Second World War.[9] One reason for its popularity was that the aeroplane made new time and space experiences possible. With its famed 'hops', it flew from one point on the map to another without traversing the space between them, thereby creating a discontinuous geography of collected rather than connected points. The world seemed to consist of isolated points which could be assembled anew via the choice of air routes and timetables, as a modern collage.

The aeroplane did not simply relativise space by further shortening travel time and distances, rather flying was a new visual representation and appropriation of space. Schivelbusch has pointed out that the railways began a process of framing and presenting the landscape in a panoramic fashion, as it was seen from the window of a passing train, in the middle of the nineteenth century.[10] The aeroplane took the panorama one step further through the aerial view, extensively represented by aerial photographs in books, magazines and postcards. The aerial 'panorama', the bird's eye view, gave spectators the idea of mastery and control of a bewildering geography. Not unlike the modern tourist's attraction to towers and skyscrapers, the view from the skies rendered the 'Olympian gaze' a new ideal.[11] In 1935 the modernist architect Le Corbusier wrote of the bird's eye view, 'it is a new function added to our senses. It is a new standard of measurement.' The eye could now see in substance what it formerly could only conceive subjectively. Corbusier thought that the aeroplane revealed an uncompromising and objective chart of the reality beneath, on which basis he called for the demolition and rebuilding of cities.[12] This idea will be returned to later.

Phrases such as 'conquering', 'shrinking' and 'annihilation' of space and time have been used in popular discourse to capture the experience of more than a century of accelerating technology. From this perspective 'time–space compression', which has been among the tropes most often repeated in the rhetoric of globalisation and the Information Age, begins to sound like an echo of the former period. Introduced by David Harvey in his book *The Postmodern Condition*, the term 'time–space compression' describes 'processes that so revolutionise the objective qualities of space and time that we are

forced to alter, sometimes in quite radical ways, how we represent the world to ourselves.'[13] Within Harvey's Marxist frame of reference, time–space compression covers the history of capitalism, but he argues that it has been intensified in the postmodern world, where 'space appears to shrink to a "global village" of telecommunications' and 'time horizons shorten to the point where the present is all there is'.[14] As Harvey is well aware, however (if not all his adherents are), this lesson of time–space compression may be new to us in scope, but it is not new in substance. However, in his dismissal of 'postmodern' intellectuals and their critique of modernism and Marxism, and through his analysis of current tendencies in culture and economy, he assesses the postmodern condition, which he dates from the 1960s, as 'somewhat special'.[15]

It is not necessary to share Harvey's materialism, or his rather one-sided critique of post-structuralist thinkers, to find his engagement in the question of time–space compression in modernity to be a good point of departure for a discussion of acceleration. There has been an increasingly unproductive debate on the difference between modernism and postmodernism. In this debate the concept of time–space compression has been used to spell out the demarcation between the eras, and to construe modernity as a historical epoch – an epoch, that is, with a beginning and an end. According to this version of the time–space compression narrative, the modern period in history, founded and driven by ideals of acceleration, will meet its logical conclusion as we approach the speed of light. Temporal and spatial co-ordinates become irrelevant in the postmodern information society – at least in some parts of the world – because they reach a state of 'instantaneousness' and 'simultaneity'. Space has now been so radically 'conquered' that there is no need to be there. Events are no longer connected to a before and after, and places are no longer embedded in localities, but are broadcast, available and consumable in an instant on screens worldwide. Hence no space needs to be traversed and there is no further need for mechanical speed.

Bauman is one proponent of this story; the French 'urbanist' and architect Paul Virilio, whose extensive writings on speed throughout the last three decades have laid out the elaborate theory of dromology, is another. The modern 'tyranny of distance' is gradually yielding to the 'tyranny of real time'. Virilio points out:

> The real-time interface then once and for all replaces the interval that once constituted and organised the history and geography of human societies, winding up in a true culture of the paradox in which everything arrives not only without needing physically to move from one place to another but, more particularly, without having to leave.[16]

Being 'mobile on the spot' is the choice of today; the modern culture of acceleration has paradoxically led to a postmodern culture of inertia in which the time–space continuum will be finally lost.

This account of time–space compression is compelling but, despite its announcements of the present as a postmodern era, it is striking how the

story is usually told in the temporal mode and in the narrative form carrying the very signature of modernity: a story with a beginning and an end, running in a straight, evolving line. It offers many remarkable insights about the effects of speed, but perhaps the virtue of Virilio and others writing in this vein should be sought in the questions they raise about speed, rather than in the answers they propose. While Virilio claims to work in transhistorical categories and the sociologists of time–space compression cannot be expected to perform the historical gesture of localising manifestations and consequences of acceleration in the past, historical analysis can be used to distribute the objects and subjects, goals and ends, of this narrative somewhat differently. Part of the often gloomy perspectives of the narrative comes from the contrast with a romanticised pre-modern past. If we centre our attention on past views of speed and acceleration, the contrast between the modern and the 'postmodern' condition does not appear as a sharp divide. The following analysis of the different ways in which the geophysical landscape and the temporal ordering of social life were staged by Futurists and Le Corbusier in the wake of the aeroplane will hopefully show as much.

## 'The beauty of speed': timing and spacing of Futurist aeroplanes

Standing in the clock tower on St Mark's Square in Venice in 1910, members of the Italian Futurism movement scattered thousands of leaflets over the Sunday afternoon crowds below, while their founder and leader, F. T. Marinetti, gave a 'Speech to the Venetians' via megaphone:

> We renounce the old Venice. . . . We want to cure and heal this putrefying city, magnificent sore from the past. ... Let us hasten to fill its little reeking canals with the shards of its leprous, crumbling palaces. . . . Let the reign of the holy Electric Light finally come to liberate Venice from its venal moonshine of furnished rooms.

No wonder the performance caused a battle between the Futurists and Venetian 'passéists'. The incident is a good example of the Futurists' boastful and grandiose rhetoric, their calculated provocation and their modernist concern to refute the past. But Futurism was also a positive confirmation of the modern reality, in which high-speed transport technologies were changing society and its values. 'Don't howl against the so-called ugliness of locomotives, trams, automobiles, and bicycles,' Marinetti urged the Venetians. Rather, one should see in those machines 'the first outlines of the great Futurist aesthetic'.[17]

The Futurists had discovered 'the beauty of speed', introduced a year earlier in *The Founding and Manifesto of Futurism*.[18] With this and a host of subsequent manifestoes the Futurists launched an impressive range of ideas in the pre-war years. Exuberant and original, as well as exceedingly aggressive and naive, these manifestoes marked an attempt to create an impetuous present in harmony with a new motorised urban life. Futurism also involved strident patriotism, and, combined with Marinetti's glorification of violence

and war ('the world's only hygiene'), Futurism's participation in the shaping of proto-fascist mentalities is clear.[19] As Kurt Möser has recently argued in this journal, in light of the uses and symbolic values of automobiles and aeroplanes in the early twentieth century, Futurism was part of a larger European tendency in which heroic indifference to danger and aggression became a valued component in the individual (male) character, creating a social environment in which war was anticipated and welcomed.[20]

Like members of other European avant-garde movements, Futurists were passionately engaged in the question of time and movement. Even today Futurist writings are among the most extensive studies on the effects and values of speed in modern society.

In this regard, the aeroplane became an important source of inspiration for Futurist visions, writings and paintings, though the automobile was also crucial in the formulation of the Futurists' ideas. Marinetti claimed that 'the airplane is the very symbol of Futurism, expressing a total break with the past'.[21] The aeroplane was cherished among the machines of modernity because it was a generator of the 'new absolute' that stretched out before the Futurist mind: 'omnipresent speed'. Speed was everywhere, not only because accelerating technology pervaded modern life, but also because the new velocity led to new parameters of what was real. 'Indeed,' wrote the Futurist Gino Severini, 'one of the effects of science, which has transformed our sensibility and which has led to the majority of our Futurist truths, is speed. Speed has given us a new conception of space and time, and consequently of life itself.'[22]

The spacing of Futurist aircraft was twofold. On the one hand manifestations of the past world would be destroyed in the wake of the machine. On the other hand flying created a new 'plastic' reality. The Futurists wanted to build a modern world in which everything had only temporary existence. The new reality should itself be on the move, continuously changing or existing only in disrupted moments and 'cuts', just like the world seen from a fast-moving vehicle. Thus the aeroplane was well suited to underscore Futurist visions. In the collective *Le Manifeste de l'aéropeinture futuriste* (1926) the Futurists spelled out the difference between aerial and terrestrial speed. Earthbound transport – such as horses, automobiles and trains – could send nearby objects hurtling past the traveller, but the distant frame of the horizon would be immobile and the eye of the earthbound traveller could rest on the horizontal continuity of the plane traversed. With aerial speed the traveller lacked both continuous plane and the stable horizon. Dives and climbs would create:

> 'an ideal hypersensitive observatory . . . made dynamic by the consciousness of a movement which transforms the meaning and the rhythm of the minutes and the seconds of the vision-sensation.' The only fixed point seems to be the 'immobile mobile' aeroplane: 'Time and space are pulverised by the shattering verification that the earth escapes with full speed under the immobile airplane.'[23]

This shows that the Futurists were no strangers to the compression of time and space, even to the point where the spatial co-ordinates seemed non-existent. But the object of their celebration of speed was not to 'save time' or 'conquer space', as it is usually construed in modern discourses on speed. Rather, the point was that moving about in the world at high speed also set the world moving. In the Futurist perspective, the speed of the aeroplane was disrupting the innermost essence of things. It drew out metaphysical questions as it prompted the Futurist to focus on the movement or temporality inherent in things, and hence the instability of the geophysical world, its objects and its events. If the aeroplane was a machine for fast travel, thus compressing the space it flew over, it was also a machine for unsettling and 'editing' the modern world. In this way we have to read the Futurists much closer to what is conventionally labelled 'the postmodern condition', in which a fragmentary, constructed and playful reality is proposed. They experienced the speed of their time, and the effects of the travel machines they used, in ways similar to the characteristics we ascribe to the present 'postmodern' society – simultaneity, inertia and plasticity.

Marinetti proposed that the experience of flying would make a new linguistic structure possible: 'Sitting on the gas tank of an airplane,' he wrote, 'I sensed the ridiculous inanity of the old syntax inherited from Homer.'[24] Because the ancient Greeks or Romans did not have the ability to fly, neither did they have a language to express the world of speed. A modern language should, for instance, make use of certain kinds of analogies as a literary ideal: every noun should be combined with its double, 'that is, the noun should be followed, with no conjunction, by the noun to which it is related by analogy'. The objects described should be confounded with the images they evoked, and then foreshortened to a single essential word. 'Man–torpedo-boat', Marinetti suggested as an example. This idea of a new syntax is interesting because it mirrors the experience the Futurists had from flying. Analogies were 'nothing more than the deep love that assembles distant, seemingly diverse and hostile things'. They would become all the more natural to man, Marinetti explained, 'as aerial speed has multiplied our knowledge of the world'. In this way, the Futurist vision was enhanced by the spacing of the aeroplane. Or, alternately, Futurist ideas were legitimised by referring to the popular flying machine:

> This was revealed to me when I was flying in an airplane. As I looked at objects from a new point of view, no longer head-on or from behind, but straight down, foreshortened, that is, I was able to break apart the old shackles of logic.[25]

It was not only language that would depict a new modern reality of analogies. Aerial speed also enhanced 'simultaneity' in painting, which, Severini explains, is the co-ordination of different elements 'totally doing away with the unities of time and place', that is, bringing together 'in a single plastic whole things perceived in Tuscany, in the Alps, in Paris, etc.'.[26] Individual objects had ceased to exist in the modern epoch of 'dynamism and simul-

taneity', Severini pointed out. Objects were caught up in the activities of the human perception, which had changed with the new speed of transport and communications.[27] Using favoured phrases like 'dynamism', 'plasticism' and 'simultaneity', the Futurists had no patience with continuous space in which every object had its set place. The swift motion of the running wheel or the swirling propeller made their outlines blurred – they were neither exactly here nor exactly there. The speed and the motion of the aeroplane exposed the 'plastic values of reality' as it foreshortened the objects and annihilated the landscapes passed.[28] As the world was cut into plastic pieces through speed, they could be co-ordinated anew in disregard of the traditional categorisation of the near and the distant. The spacing of the Futurist aeroplanes closely resembles the effects described by the time–space compression narrative of today.

If we look at the timing integrated in the Futurist ideas of speed and the aeroplane, there are critical historical implications. As already noted, Marinetti pointed to the centrality of the aeroplane for the Futurists, because it expressed a total break with the past. But if Futurists abhorred everything they found traditional and *passé*, their striving and experiments seemed to be meant for the present; the future world was rarely depicted or described. Perhaps the future can best be described as a verb in Futurist thinking.[29] The destruction of the past and of history involved in Futurist timing was, however, projected to the future as an astounding 'flash forward' in the *Founding Manifesto*. 'The oldest of us is thirty: so we have at least a decade to finish our work,' Marinetti wrote. But it was only a short respite: 'When we are forty, other younger and stronger men will probably throw us in the wastebasket like useless manuscripts – we want it to happen!' Like dogs the young men would come to the doors of the academy and sniff the strong odour of decaying minds. The 'old' Futurists would already be gone, although 'They'll see us crouched beside our trembling airplanes in the act of warming our hands at the poor little blaze that our books of today will give out when they take fire from the flight of our images.'[30]

Neither the aeroplane, not Futurism itself, seems to be able to stand up to the aggressive timing inherent in this line of thought. Futurist timing had an edge of permanent destruction to it. The demolition of the past was the key to modern creativity and will-power. Advances in the speed of mechanised transport enhanced the process, but the Futurists also thought their own ideas and manifestations should be left and destroyed.

Perhaps the architect Antonio Sant'Elia can be described as a Futurist trying to delineate a future world. His drawings of a futurist 'new city' show huge, impressive buildings and skyscrapers integrated into a traffic centre, for example 'Airport and railway station with elevators and funiculars over three-levelled streets', a drawing from 1914.[31] Sant'Elia aimed for an architecture completely in accord with the conditions of modern life. 'The Futurist house must be like a gigantic machine,' he wrote in 1914.[32] The Futurist city demanded 'beneficial demolition', as Sant'Elia put it, just as the Futurist manifesto called for the timing of permanent change:

> From an architecture conceived in this way no formal or linear habit can grow, since the fundamental characteristics of Futurist architecture will be its impermanence and transience. . . . EVERY GENERATION MUST BUILD ITS OWN CITY.[33]

Sant'Elia died as a soldier in 1916, so his buildings were never built. His thoughts on Futurist architecture were in accordance with the speed and changeability of modernity, although the monumental buildings in his drawings do not seem to be of the impermanent and transient kind.

By the end of the First World War the first Futurist generation had almost disappeared, its members either dead or separated from the movement. Paradoxically, while the Futurists favoured Italian intervention in the war on the side of the Entente, against German and Austrian conservatism, and many of them joined the Italian army with enthusiasm in 1915, the war did not prove to be a force for Italian national rebirth in the way the Futurists had predicted. Marinetti found new Futurist friends in the years between the wars and he was an early member of the Fascist Party which grew swiftly in Italy after 1919. Although Futurism had an uneasy relationship with the Fascists, it must be said that some of the Futurist art of the second generation, notably the *aeropittura* (aeropainting), was little more than Fascist propaganda.

### 'The airplane indicts': Le Corbusier on modern time and space

When the Swiss-born architect Le Corbusier began writing in Paris a little over a decade after Futurism had had its heyday in Milan, his polemical style and long list of 'demands' for a modern architecture held several parallels with the Futurist manifestoes. But Le Corbusier was no friend of the Italian movement. A world war had changed Europe and its intellectual climate, and while Le Corbusier's writings testify to the continued idealisation and symbolic value of the aeroplane, the society he envisioned from an aerial perspective was entirely different.

Le Corbusier (1887–1965) was a leading modernist architect and his writing, not least the famous collection of essays *Towards a New Architecture* (1923), has been highly influential upon subsequent generations in his field. He was inspired by the 'Neue Sachlichkeit' movement in Germany after the First World War and he had close connections with Walter Gropius of the Bauhaus movement. While Gropius famously declared that 'fitness for purpose equals beauty' and dismissed the ornaments and traditional styles of architecture in favour of buildings based on practical needs, the implications of such a functionalist architecture found their way into the proposals and statements of Le Corbusier.[34] Besides the dictum that 'form follows function', functionalism was grounded in the passion for 'the welfare of the species' – welfare that Le Corbusier thought was tied to the modern world's technological advances leading into a 'joyous machine civilisation'.

While Le Corbusier's architecture is not the focus of this article, it is interesting to note that his writing reflects the view of the aeroplane as a

vision instrument. He wrote in 1935, 'the airplane instils, above all, a new conscience, the modern conscience', thus affirming the close link between modernity and transport machinery. *Towards a New Architecture* included a chapter on aeroplanes, and it is here that Le Corbusier makes his celebrated statement 'The house is a machine for living in.' The link between houses and aeroplanes runs through his work; the lesson to be learned from the aeroplane was 'to see in [it] not a bird or a dragon-fly, but a machine for flying'.[35] Thus for Le Corbusier the aeroplane grew out of modern mechanical effort, cleansed of romantic, traditional or culturally based thinking, existing only to fulfil the function of flight. 'The airplane is nothing except a supporting plane – a means of propulsion. CLEARNESS OF FUNCTION!'[36] Likewise modern houses should be designed and developed like machines, with regard to the practical human needs and the mechanical potential of the modern world.

Celebrating the novelty of the modern world, Le Corbusier sought to diminish his contemporaries, whose architectural principles were out of step with his own. Other architects were limited by 'eyes which do not see'.[37] They were blind to the facts of modern technological development and the revolutionary new ways of working, living and thinking it brought about. In contrast, Le Corbusier made demands for housing and town planning in the new 'Machine Age', rhetorical strategies which may appear familiar from the Futurist manifestoes. Le Corbusier inserted photographs of ocean liners, aeroplanes and automobiles in *Towards a New Architecture*, so as to visually shock the reader into acknowledging the presence of a new era within the old. *Towards a New Architecture* was meant to 'remove the veil which still largely obscured the new era of machine civilisation', as Corbusier later noted.[38] The photographs of aeroplanes were supposed to make the existence of a new epoch clear. It is as if the author built his argument upon the mere outline of a flying machine.

If we compare this with the Futurists' devotion to aircraft, Le Corbusier's aeroplane is not represented by the propeller swirling, or the earth continuously moving underneath. The Futurists thought that the aeroplane made a 'plastic reality' of the material world, but the photos of aeroplanes in *Towards a New Architecture* work rather as an argument of essence: the stable being and meaning inherent in things. The existence of aeroplanes or automobiles is presented as an overwhelming and convincing power in and of itself. Aeroplanes 'materialised' the future and advocated a radical breach with tradition that had, in a sense, already happened.

The revolutionary timing of the aeroplane implied an aggressive approach towards history, not unlike the one advanced by the Futurists. Like Sant'Elia, Le Corbusier subscribed to the idea of 'beneficial demolition', if not outright destruction, of the old. 'Cities, with their misery, must be torn down. They must be largely destroyed and fresh cities built,' Le Corbusier wrote in the book *Aircraft*, published in London in 1935.[39] Being a popular book about how the aeroplane was thought to change the world in both concrete and symbolic ways, *Aircraft* is a rich source for historians of transport. It consists of selected photographs and comments written by Le Corbusier, and opens

with a short programmatic text. It is also interesting to see how in this book, published more than a decade after *Towards a New Architecture*, the aeroplane has changed its function. The machine for flying had now become an instrument of spacing rather than timing. In *Aircraft* Le Corbusier holds the aeroplane out no longer as an object of wonder, but as a machine in use. It is a machine moving closer to the human body so as to be integrated in the senses of man. In the early 1920s the blind architectural eye was exorcised by giving it an aeroplane to behold, but in *Aircraft* the machine becomes the eye itself, or, as Le Corbusier comments:

> The point then was that our eyes did not see . . . But to-day it is a question of the aeroplane eye, of the mind with which the Bird's Eye View has endowed us, of that eye which now looks with alarm at the places where we live.

The aeroplane eye scrutinises and penetrates the cities of the world, getting 'to the heart of the cruel reality'. Documented with photography, the aeroplane gave the proof to Le Corbusier's ideas:

> 'The brief and rapid history of aviation, so close to us . . . provides us with the certainty that soon the very laws of life will justify us.' Because cities were built without regard for human needs, because they were built only in consideration of making money, the cities of the modern world were crumbling: 'The airplane eye reveals a spectacle of collapse.'[40]

In Le Corbusier's writing the aeroplane takes the form of an embodied vision machine, a 'cyborg' documenting the claims of modernism. From its panoptic position the eye of the man/aeroplane was objective and merciless, it not only sees, it also judges. As the subtitle of Le Corbusier's book puts it, 'The airplane indicts.' Already in 1923, Le Corbusier thought that:

> [t]here is a moral sentiment in the feeling for mechanics. The man who is intelligent, cold and calm has grown wings to himself. Men – intelligent, cold and calm – are needed to build the house and lay out the town.[41]

The spectator cooled himself by integrating with the objective forces of the machine; the aeroplane endowed him with super-vision.

The Futurists thought that the fast moving airplane compressed time and foreshortened space in such a way that a new plastic reality could be constructed out of the concentrated, isolated bits and pieces, doing away with the rules of geography and chronology. Le Corbusier's 'aeroplane eye' reached an opposite conclusion. The space covered by the aeroplane's overview is not a moving and swirling reality. Flying an aeroplane provided Le Corbusier with a set horizon and a frozen surface. The layouts of the cities were established as stable entities, distributed in an objective, uncompromising plan, which called for destruction.

The aerial vision machine could also reveal another kind of truth, however: the natural laws beneficial to human habitation. Le Corbusier recounts

a flight over the nomad towns of the M'Zab oasis in the Sahara Desert of Algeria. From the ground, he had inspected one of the M'Zab 'winter cities' on an earlier occasion, and found it to be an impassive 'inferno of stone'. But flying over the same town reversed that impression:

> The airplane had revealed everything to us, and what it had revealed provided a great lesson. Behind the blind walls of the streets were laughing houses, each opening with three ample arcades on an exquisite garden.

The M'Zab townspeople gathered to watch the aeroplane with joy, Le Corbusier recounts, and, with this picture in mind, he states:

> every house in the M'Zab, yes, every house without exception, is a place of happiness, of joy, of a serene existence regulated like an inescapable truth, in the service of man and for each. Up in the air this can be clearly seen.[42]

The quotation captures a classic imperialist idea: flying over colonised Algerian nomads, the modernist architect from Paris dreams of a happy, serene existence, which he sees as an inescapable truth built into the layout of the town. It is all revealed from the air. The Olympian gaze of power and knowledge is enhanced by Le Corbusier's aeroplane.

This aeroplane is loaded with aggression when it flies over 'the great cities of the world, those of the nineteenth century, bustling, cruel, heartless, and money-grubbing'. It is an aggression different from the Futurist hatred for the *passé* and it is not the past, as such, that Le Corbusier wants to eliminate.[43] It is the 'mess' of the street, the conglomerate of different styles. It is the historicity of the modern world, its changing and differentiating character, which he wants to expunge from the city so that 'these streets in sinister confusion, full of noise and squalor, will cease to be'.[44] Le Corbusier does not seem to be satisfied to 'live in the absolute' of speed, or to define the modernity of his present world by constantly renewed experiments. On the empty ground of the demolished cities he wants to build the future; a world of lasting structures, functional and true.

If there is beauty in speed in Le Corbusier's thinking, it is because speed demands straight lines: straight roads, straight aims. 'A modern city lives by the straight line; inevitably,' Le Corbusier notes in *The City of Tomorrow* (1924), pointing to traffic demands as well as human life. 'The curve is ruinous, difficult and dangerous; it is a paralysing thing. The straight line enters into all human history, into all human aim.'[45] The aeroplane shares this celebrated feature: 'the aeroplane flies straight from one point to another,' he writes in *Aircraft*, illustrating his point with a map from Scandinavian Express Airlines which shows the route from Copenhagen to Amsterdam as a straight line.

> This picture enables us to appreciate the extent of an almost miraculous emancipation. Likewise in our own undertakings of today we can set ourselves high aims and attain them by dint of intelligence and the freedom produced by technical knowledge, character, and will-power.[46]

Again we see a theme in Le Corbusier's idea of the aeroplane and modernity, echoing the Futurists: the straight line is opposed to and triumphs over the curved. But the meaning of this straight line differed between them.

Le Corbusier describes the curved track as the pack mule's way, whereas man naturally opts for the straight road because 'pure geometry' was a free man's tendency. 'Man walks in a straight line because he has a goal and knows where he is going.' The straight road was 'sane and noble'. The winding road, on the other hand, was the result of a 'happy-go-lucky heedlessness' and 'animality'.[47] The aeroplane seems both to be the outcome of such straight human aims and, by the nature of its movement, to draw the same noble line in the air, signifying emancipation from nature. The flying machine helped to set the world straight in terms of true and false, right and wrong. With its mechanical eye it casts a geometric grid over the world to distinguish the straight, natural, true and noble from the curved, ruinous, dangerous and paralysing.

The flying machine is idealised by Le Corbusier because it brought distance and overview, rather than the Futurist idea of immersion and closeness between otherwise divergent things. The speed of aircraft, and their foreshortening of space and objects, are valued by the architect because they instil in the airborne traveller 'super-vision', enabling him to look at the world from afar with an objective gaze. Under Le Corbusier's aeroplane the world shrinks, but only to conform to a universal standard: 'If you were to look down from the sky on the confused and intricate surface of the earth, it would be seen that human effort is identical throughout the ages.'

Human beings were essentially constructors of geometrical cells, their striving conforming to straight lines and right angles.[48] Only the big cities of Europe had gone wrong; the aeroplane revealed this, indicting the cities. Though Le Corbusier was aware that the modern conscience was a 'plastic vision', which could not presume to be 'dictating imperishable things of the future', such scattered statements seem to contradict, rather than moderate, his ideas on a universal 'harmonising influence' or inevitable truths.[49] The course ahead, in the trail of the aeroplane, appeared to be unwavering following the laws of harmonising order and pure geometry it had revealed.

## Unstraightening the time–space compression narrative

'Means of transport are the basis of all modern activity,' Le Corbusier wrote in *The City of Tomorrow*.[50] A reading of his ideas, as well as those of the Futurists, supports the view that accelerating transport technology was part of the foundation of modernity. By altering the one-to-one relation between time and space, mechanised transport allowed various new constructions of modern reality.

Through the study of Futurist and functionalist perceptions of aeroplanes, it is possible to further specify the link between transport, acceleration and modernity. The flying machine did not introduce acceleration; it carried on a process begun by earlier transport technologies. But in the period studied

here, the first four decades of the twentieth century, it became by far the fastest means of transport. At the same time it developed distinct values and meanings because of its special kind of motion: flight. Aerial speed correlated with modernity; it both underpinned and developed what was modern. This correlation should be considered on two levels. On the one hand, the early flying machine was conceived as an outstanding modern object, and its activity, flying, was thought to signify the very essence of modernity. At this level the machine and its performance were looked upon as modern phenomena. On the other hand, the aeroplane gave the world a new outlook. By its aerial speed the flying machine broke up and redistributed the space underneath, allowing it to interact and be co-ordinated with modern ideas and ideals. The aerial view permitted people to visualise modernity and to envision a modern society by seeing the world's spatial proportions transformed.

Neither the modernity inscribed in the aeroplane as an object, nor the modernity experienced from an aerial viewpoint, is directly derived from the flying machine's accelerated pace. There is an element of social construction which cannot be isolated and removed from the factual impact of the machine and its aerial speed. We see this element highlighted when focusing on the differences between the Futurists' and Le Corbusier's perceptions of the aeroplane. Though the design and performance of the aeroplane underwent big changes between 1910 and 1930, it was basically the same machine that led the two parties to differing conceptions of modernity. Moreover, where Futurism and functionalism shared common ground, the cultural components in their assessment of flight must also be noted. In other words, the original idea that the mechanisation and acceleration of transport were a necessary prerequisite for the rise of modern society should be adjusted to the fact that the machines of transport were also culturally constructed to fit the various visions of modernity.

Futurist and functionalist discourses displayed the aeroplane as the emancipation of man, freeing him from earthbound limitations. Both dreamt of a modern civilisation based on machines. In the case of Futurism, the aeroplane led to a vision of a world of heroic danger and power. With the hindsight of Fascism's development in Italy, it is a vision with chilling implications. After the war Le Corbusier envisaged a more peaceful world, although he quoted Mussolini and showed a certain excitement about the destructive capacity of bomb-carrying flying machines.[51] Le Corbusier thought that the new machine civilisation should be governed by the same scientific laws that had led to the creation of the aeroplane. The aeroplane was a 'machine for flying', and likewise the house and the city should be machines for living. Of course, none of these visions was inherent in the aeroplane.

In conclusion, what are the Futurist and functionalist points of view and what are the correlations between aeroplanes and modernity? Let us consider them under the headings of the *timing* and *spacing* of the aeroplane.

1 *Timing*. Both the Futurists and Le Corbusier tended to define the aircraft as a revolutionary machine. By leaving the extended, continuous ground it signified a rupture in tempo and chronology. The flying machine had landed in a world where human consciousness was generally in a state of delay. The aeroplane was already part of the future, already in touch with the coming and the unknown – a future void which both the Futurists and Le Corbusier tried to fill with their own ideals of a truly modern world. Instead of mediating the gap between the past and the future, Futurist and functionalist flying machines showed a marked aggressiveness towards the past, establishing a perception of the modern as a revolutionary new period in time. Thus far the Futurists and Le Corbusier had similar views on the aeroplane – it signified the modern through a break with the past, and left the ruins of the traditional world in its wake. They did not agree, however, on whether the vacated space would be a place of 'permanent rebuilding' or for a new future of stable structures. The timing of Futurism is embedded in historicity, while Le Corbusier's is of straight and progressive history.

2 *Spacing*. By its fast and aerial motion, the aeroplane foreshortened space. Not only distances shrank but the material world itself was compressed. This compression, however, led Futurism and functionalism to opposing perspectives on the modern world and the direction in which it was heading. To the Futurists the speed of the aeroplane multiplied the possible perspectives of the world; generating a new simultaneity. It 'totally [did] away with the unities of time and space', as it permitted the assembly of seemingly divergent and hostile elements. Aerial speed questioned the ontological properties of things and their spatial and temporal relations; it created a world constantly on the move, and the Futurists pointed to the spinning propeller of the aeroplane as an example of 'dynamism' and 'plasticity': material integrated with time and motion. If Futurist flying machines were the avant-garde of a discontinuous geography and a fragmentary, destabilised reality, Le Corbusier promoted the aeroplane as the avant-garde of precision and order. It was no longer the whirling propeller that marked the essence of the machine, but the straight line it drew in the air as it flew directly from one point to another. The compression of the world underneath stabilised the spatial outline, providing the basis for obtaining an objective 'super-vision' through the bird's eye view. Unlike the Futurists, the spacing of Le Corbusier's aeroplane was a sorting out of confused cities and vast land masses; it was an illustrative topography providing evidence for the course of a future which earthbound man could only vaguely imagine. With its bird's eye view added to the senses of man, the aeroplane disclosed universal structures and laws on the way to a new, joyous machine civilisation.

The timing and spacing strategies of the Futurists and Le Corbusier are not easily fitted into the time–space compression narrative. Though the velocity of transport and communication has increased in the age of modernity, the

effects of acceleration do not seem to conform to the linear scheme of continuous compression. By focusing on the speed of the aeroplane this article points to a more uneven account. There was a kind of 'disjunction' inherent in the aeroplane; it was an 'untimely' machine. Aeroplanes created a disruption in the basic categories of time and space. The study of the Futurists' and Le Corbusier's thoughts on the aeroplane and modernity shows that this disruption could be elaborated, framed and defined to contain the modern. But the process did not happen uniformly or automatically. Speed permeates the history of transport and modernity, but it does so in multiple ways. The time–space compression narrative is not adequate to encompass this history. There are other stories competing for historical recognition; stories that, at our end of the modern age, modify both the ideal of acceleration and its current deterministic outlook.

## Notes

1 Zygmunt Bauman, *Liquid Modernity* (Cambridge, 2000), pp. 110, 9.
2 The terms 'timing' and 'spacing' were developed at the conference 'Timing and Spacing: Rethinking Globalization and Standardization', Palermo, 1–3 November 2001, arranged by Bruno Latour and colleagues.
3 Of speed as a virtue in American society see Christian Gelzer, 'The Quest for Speed: an American Virtue, 1825–1930', Ph.D. dissertation, Auburn University (Auburn AL, 1998), UMI Microform No. 9920204, 1999.
4 F. T. Marinetti, 'Destruction of Syntax – Imagination without Strings – Words-in-freedom' (1913), in *Futurist Manifestoes*, ed. Umbro Apollonio (Boston MA, 2001), p. 96.
5 Marinetti, 'Destruction of syntax', p. 96.
6 *Ibid*., pp. 96–7.
7 Stephen Kern, *The Culture of Time and Space, 1880–1918* (Cambridge MA, 1983).
8 Wolfgang Schivelbusch, *The Railway Journey: the Industrialization of Time and Space in the Nineteenth Century* (Berkeley CA, 1986), p. 34. Schivelbusch quotes the journal *Quarterly Review*.
9 Joseph Corn, *The Winged Gospel: America's Romance with Aviation, 1900–1950* (New York, 1983), offers an account of the enormous enthusiasm surrounding the advent of the aeroplane in the United States.
10 Schivelbusch, *The Railway Journey*, chapter 4.
11 Regarding the development of the Olympian gaze in relation to skyscrapers see David Nye, *American Technological Sublime* (Cambridge MA, 1999), chapter 5.
12 Le Corbusier, *Aircraft* (London, 1935; Paris, 1987), caption of picture No. 96.
13 David Harvey, *The Condition of Postmodernity: an Enquiry into the Origins of Cultural Change* (Oxford, 1990), p. 240.
14 *Ibid.*, p. 240.
15 *Ibid.*, p. 306.
16 Paul Virilio, *La Vitesse de libération* (1995), trans. J. Rose, *Open Sky* (London, 1997), p. 19.
17 F. T. Marinetti, 'Against past-loving Venice' (1910), in *Marinetti: Selected Writings*, ed. R. W. Flint (New York, 1972), pp. 55, 56.
18 F. T. Marinetti, 'Founding and Manifesto of Futurism' (1909), in *Marinetti: Selected Writings*.
19 Futurism's legacy has been dominated by Walter Benjamin's interpretation, which points to Futurism as a substantially Fascist manifestation. According to Benjamin in his 1936 essay *Das Kunstwerk im Zeitalter seiner technischen Reproduzierbarkeit* (Frankfurt am Main, 1965), the logical result of Fascism is to render politics aesthetic – a process culminating in war. Benjamin quotes a manifesto by Marinetti, which glorifies the Ethiopian colonial war, and commends the manifesto as an exemplary clear account of Fascist motives and reasoning (pp. 48 ff.). Though the Futurism of this article was largely created in 1909–15 and hence before the Fascist Party was established in 1918, Marinetti's later

alliance with Fascism is one reason why the early movement's significant scenario for the twentieth century's cultural modernism has been blocked from the collective historical memory. 'The relationship between Futurism and Fascism has caused embarrassment to generations of historians,' Caroline Tisdall and Angelo Bozzolla note. 'The result has been a refusal to examine the context and complexities of a time when, in culture as in politics, the boundaries between good and bad, left and right, progressive and reactionary, revolutionary and repressive, were not so clearly perceptible. Shielded by the comfortable knowledge that Futurism shared at least three characteristics with fascism [glorification of the machine, use of violence against opponents, and infatuation with youth] generations of writers . . . have left it at that.' (*Futurism*, London, 2000, p. 200.) Marinetti left the Fascist Party a year after its establishment but never attempted a break with Mussolini, who appointed him to the Royal Academy of Art after the First World War. Early Futurism should not be looked at in isolation from the movement's Fascist development, nor should one understate the Futurists' extremist ideas on violence, destruction and war. But their early ideas on speed, time and space deserve attention which does not simply reduce them to a 'Fascist aestheticising of politics'.

20 Kurt Möser, 'The dark side of "automobilism", 1900–30: violence, war and the motor car', *Journal of Transport History*, 24, 2 (2003), 238–58.
21 Quoted in G. Lista, *Futurism* (Paris, 2001), p. 166.
22 Gino Severini, 'The Plastic Analogies of Dynamism: Futurist Manifesto' (1913), in *Futurist Manifestoes*, ed. Umbro Apollonio (New York, 1973), pp. 124–5 (emphasis in original).
23 Marinetti, Balla, Bernadetta, Depero, Dottori, Fillia, Prampolini, Somenzi, Tato, 'Le Manifeste de l'aéropeinture futuriste', in *Manifesti, proclami, interventi e documenti teorici del futurismo 1909–1944* II, ed. Luciano Caruso (Florence, 1980), document No. 263. This French version of the Italian manifesto, which I have translated here, was published in 1931.
24 F. T. Marinetti, 'Technical Manifesto of Futurist Literature' (1912), in *Marinetti: Selected Writings*, p. 84.
25 *Ibid.*, pp. 84–5, 88.
26 Severini, 'The Plastic Analogies of Dynamism', p. 121.
27 *Ibid.*, pp. 121, 125.
28 See also Umberto Boccioni, 'Absolute Motion + Relative Motion = Dynamism', in *Futurist Manifestoes*.
29 As suggested by the curator of the Tate Galleries, Richard Humphreys, in *Futurismen* (Copenhagen, 2000).
30 Marinetti, 'Founding and Manifesto of Futurism', pp. 41, 43.
31 Sant'Elia's drawings are printed in Pontus Hulten (ed.), *Futurismo e futurismi* (Milan, 1986), pp. 212–23. 'Airport and railway station . . . .' was published on the leaflet of Saint'Elia's 'Manifesto of Futurist Architecture'.
32 Antonio Sant'Elia 'Manifesto of Futurist Architecture' (1914), in *Futurist Manifestoes*, pp. 169, 170.
33 *Ibid.*, pp. 170, 172 (capitals in original). Some researchers hold that this last section was added to the manifesto by Marinetti, only reluctantly accepted by Sant'Elia. See Kern, *The Culture of Time and Space*, p. 100. For an alternative account of Saint'Elia opposing Kern's interpretation of the Futurist architect see Tisdall and Bozzolla, *Futurism*, pp. 124–33.
34 The relation between functionalism and Bauhaus is discussed in Walter Gropius, *The New Architecture and the Bauhaus* (London, 1935). The quotation is from p. 19. Robert Furneaux Jordan, *Le Corbusier* (London, 1972), explores among other things Le Corbusier's apprenticeship in Germany.
35 Le Corbusier, *Vers une architecture* (1923), trans. F. Etchells, *Towards a New Architecture* (London, 1927; New York, 1986), pp. 107, 110.
36 Le Corbusier, *Aircraft* (London, 1935; Paris, 1987), caption of picture No. 8.
37 Le Corbusier, *Towards a New Architecture*, p. 89.
38 Le Corbusier, *Aircraft*, p. 5.
39 *Ibid.*, p. 12.
40 *Ibid.*, p. 5, 11, 12.
41 Le Corbusier, *Towards a New Architecture*, p. 117.
42 Le Corbusier, *Aircraft,* p. 12–13 (italics in original).
43 *Ibid.*, p. 12. A famous photo of the Parthenon and an automobile in *Towards a New Architecture* compares the two artefacts to illustrate that other periods of history could find the

correct architectural solution to the need of their times. See Le Corbusier, *Towards a New Architecture*, p. 140.

44 Le Corbusier, *Aircraft*, p. 13.

45 Le Corbusier, *Urbanisme* (1924), trans F. Etchells, *The City of To-morrow*, in *Essential Le Corbusier: L'Esprit Nouveau Articles* (Oxford, 1929, 1998), 10.

46 Le Corbusier, *Aircraft*, caption of picture No. 65.

47 Le Corbusier, *The City of To-morrow*, pp. 5, 12, 22.

48 *Ibid.*, p. 25. On the precedence of the right angle, p. 21.

49 Le Corbusier, *Aircraft*, caption of pictures Nos 35 and 36.

50 Le Corbusier, *The City of To-morrow*, p. 85.

51 See Le Corbusier, *Aircraft*, caption of picture No. 25. Le Corbusier's views on aeroplanes and war, pp. 8–9. On the pictures of German glider camps, which by 1935 were organised and heavily promoted by the National Socialists, Le Corbusier comments, 'New machines, new men. They are filled with enthusiasm, the pleasures of daring, of breaking with current stupidities. Once in the air . . . they exult in the daring of their departure.' (Caption of pictures Nos 76–81.)

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