

Chapter 4

The *Wahlverwandtschaft* of Modernity and Mobility

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Whether or not we agree with Kipling's assertion that 'transportation is civilization', it is plain that most of our present civilization is dependent on transportation (Osgood 1972 [1937], 177).

In this paper, sociological theory is employed to interpret perpetual increase in traffic as a necessary consequence of social modernisation. Both social modernisation and growth in transportation are interdependent: they mutually determine each other and are interlinked in their historical and future development. Based on this analysis, a scenario is explored of possible future political developments and sustainability-orientated strategies in the field of transportation policies.

Outline of the problem

At some time during the 1990s, a German prosecutor called for the revoking of driving rights as an all-purpose sanction in addition to sanctions commonly administered in acts of petty or other less severe crime. This idea, which had already been applied successfully in the US in cases of fathers failing to meet their child support obligations, was widely applauded among the members of the German parliament's judiciary committee. Committee members across all factions were enthused. The question of judicial expediency notwithstanding, the very fact that restraining spatial mobility ensured by the automobile may reasonably be considered a penalty on par with imposing a fine or even imprisonment casts a striking light on the significance assigned to self-directed spatial mobility in modern everyday life that we may associate with the term '*auto-mobile*'. Apparently, '*auto-mobility*' in this sense of potential for self-directed movement is attributed similar significance for the realisation of life chances as liberty, inviolability of the person and the right to property. In this vein, Immanuel Kant, as an intellectual forefather of modern democracy, spoke of a right of visitation according to which '[a]ll men are entitled to present themselves thus to society ...', ship or camel providing the means 'for men to approach each other', thus enabling 'social intercourse' (Kant 2004 [1891]; see also Kant 1968 [1797], 476). Pointing this out, Kant emphasised the role of overcoming space for communication. Mobility enables community and social participation; it fosters expansion of cultural horizons and mutual inspiration. The liberty to take part in traffic must thus be viewed as essential to

modern, democratically open societies, in which communication along with all activities to this end have attained profound significance. Mobility ensures the accessibility of places and facilities where people congregate and activities are performed. In other words: transportation enables sociality.

That is the bright side of the coin. However, today its darker flip side is forcefully pushing to the forefront of attention: transportation not only enables, but constrains as well. The means have begun to affect the ends and have developed a destructive dynamic of their own. In addition to environmental and social-spatial separation effects associated with transportation, the economic dimension of modern transport-related problems needs to be emphasised in this regard. Current trends suggest ever-continuing expansion into political, economical and cultural spaces on a global scale which then become routinely accessible – a process that is bound to entail perpetually increasing flows of traffic. This ongoing development appears to be drastically confirmed indeed by persistent growth rates, especially in freight and passenger air traffic. The dilemma between traffic growth, on the one hand, and economic, ecological and social goals, on the other, is constitutive to the normative frame of reference of traffic-critical social discourse, which has been coming to a head during the last decades. The controversial nature and complexity of this debate is fuelled by the fact that mobility and transportation – with all the underlying structural, symbolic-expressive and liberty-related causes and motives driving them – lie at the core of modern societies.

Against this background, it is all the more surprising that to date there have been few notable sociological attempts to systematically position mobility and transportation in the context of modernisation. Actually it is quite puzzling that sociology, as the science of society, while claiming to address the conditions and developments of modern society, in fact, has so little to say on an area of such obvious significance to modernity. That is not to deny that there have indeed been sophisticated contributions on the subject matter, especially during the past fifteen years. However, assessing the state of the art of current research, one has to concede that we are still facing what amounts to little more than fragmented 'trace elements' in the field of transportation sociology; this is particularly true for German-speaking countries. Just as mobility to date has failed to attract the attention of sociological theory, transportation sociology has yet to be established as a sub-discipline of sociology. In particular, sociology exhibits a lack of research on the fundamental issue of traffic genesis. Transportation sociology ought to provide insight into the relationship of transportation, society, its functional spheres and the individual as a social being. Why has this relationship historically taken on its specific form? What options might be available for shaping transportation without compromising its potential and functionality for satisfying social and individual transportation needs? These are issues that need to be placed on the research agenda. In accordance with this focus, the general question as to the relationship of modernity and mobility will be explored in the following; it will provide the analytical frame of reference for this article.

In approaching the relation of modernity and mobility, it should prove helpful to pose the question anew as to the sources of traffic from the angle of social theory. Transportation research, in general, lacks insight into the (social) roots of traffic

generation at the macro-analytical level of social structure. This shortcoming will be remedied by shedding light on structural and processual dimensions of modernity from a transport-sociological macro perspective. This will allow us to arrive at conclusions on the relationship of transportation, mobility and modernity. On these grounds, the general process will be explained by identifying which social relations subject to change in the course of societal modernisation induce traffic growth at the spatial level, on the one hand, while, on the other, showing how these changing spatial relations in turn impact upon modernisation.

I will proceed in the following manner: first, the following section will provide a conceptual and historic empirical foundation for further analysis. Then, the third section will introduce a set of propositions based on the idea that modernity and mobility are characterised by a relation of '*Wahlverwandschaft*' (elective affinity) in the Weberian sense. This notion seeks to capture a specific intrinsic commonality, a relation of interpenetration and mutual enhancement, in which either one cannot be thought of without considering the other.¹ Finally, in the fourth section, these considerations will result in an outline of consequences for traffic policy.

The quantitative and qualitative mobilisation of modernity: reflections on the concept and phenomenology of mobility society

Modern societies are characterised by a tremendous increase in options for communication and interaction. Lash and Urry have noted accordingly:

Modern society is a society on the move. Central to the idea of modernity is that of movement, that modern societies have brought about some striking changes in the nature and experience of motion or travel. This has been explored by a number of seminal commentators. However, this literature does not connect together the changing forms of transportation with the more general debates on the nature of modernity (Lash and Urry 1994, 252).

The objection might be raised that spatial mobility – virtually being an anthropological constant – has always been a part of human existence. What then is specifically modern about it? In order to answer this question the relationship of modernity and mobility will be approached from a phenomenological perspective. In a first step, typical features of modernity in contrast to pre-modern society will be briefly characterised. The transition from one period to the other can be conceived as *quantitative mobilisation*. The distinctive change to be noted is that society came in motion to a hitherto unprecedented extent.

The transition from pre-modernity to classical modernity: quantitative mobilisation

With modernity, a cumulative dynamic resulting from a self-accelerating development in all social spheres set in. While in pre-modernity spatial interaction had followed

¹ This article is based on research on the genesis of transportation in modern society published in Rammler 2001.

the principle 'continuation and stability', transition to modernity triggered a radical paradigm change toward 'progress and dynamism' (Loo and Reijen 1997, 51). Even though the protagonists of mediaeval spatial mobility – travelling merchants, crusaders, itinerant monks and pilgrims – were integral to the pre-modern 'stability pact', they at the same time played a crucial role as *mobility avant-garde*; as such, they were instrumental in transcending cultural and economic boundaries as a precondition for further dynamisation. These historical elites of mobility and velocity played yet another important role in paving the way for *mobility society* at the cognitive and infrastructural level and in terms of the knowledge base they provided. Not only had they cleared the path for accessing hitherto unknown cultural spaces intellectually, but also spatially and geographically. They had sought, pioneered, and documented topographies unknown at the time, had optimised the technical means of travel and communication, and, in so doing, had tremendously increased knowledge instrumental to mobility. In analogy to Karl Marx's primary accumulation of capital, this increase in knowledge can be conceived as primary accumulation of mobility-related cultural capital. Once a certain point of quantitative growth had been reached, the interplay of mobility-related cultural capital with a bundle of mutually stabilising and reinforcing initiating conditions ultimately set up the qualitative take-off of a completely new economic and social order. In this respect, this cultural capital must be considered a significant facilitating factor.

In pre-modern, traditional society, the slow-paced gradual development of access to and control over the respective empire's internal territory, thus, the development of transportation routes for commercial and politico-military purposes are the most notable processes of spatial organisation. Daily trips led to the field, the pasture or the fishing grounds. Sanctuaries or courts were the destinations of travel. And only very few of the privileged could claim the right and command the technical and economic potential to cross significant territorial boundaries (Franz 1984, 41). In this regard, pre-modern society was characterised by very little *residential mobility* and by *circular mobility* – a term denoting the process of commuting between residence and workplace – only to the extent required by the modes of social exchange, agriculture, commerce, war and religiousness typical of the time. The system of stratification at the basis of pre-modern societies proved to be a rigid and immobile formation, showing very little permeability; it was a *society of estates*, consequently, in terms of social mobility a *static* society. Once born a serf, peasant or craftsman, one generally remained confined to this social position for life. Opportunities to change one's social status, for example, by meritocratic performance, were very rare. On the other hand, we may assume that the idea of career mobility was just as insignificant in guiding action as was any longing for distant horizons – both appear to be typically modern in today's perspective.

'All that is solid melts into air ...', with this image of change induced by the capitalist mode of production, Marx and Engels (1947 [1848], 17) pinpointed a distinct contrast in the two successive eras. Traditional society had been 'solid', based on 'fixed, fast-frozen relations', as phrased in the Communist Manifesto (ibid., 16), stationary with respect to spatial mobility and static in terms of social mobility. In contrast, modern capitalist society was dynamic, mobilising, energetic, and under pressure, just as the steam engines symbolic of the era. Traditional social

relations were 'volatised' just as coal was vaporised in the blast furnaces of capitalist production. The doubly free labourer emerged on the stage of world history; the bourgeoisie seized the feudalistic levers of power, preparing the ground, politico-militarily and ideologically, for imperial usurpation of space far beyond Europe. With this, modernity was born and the foundations of globalisation were laid. Cultural mobility, too, followed the paths paved by economy – by its transportation and communication routes and in the minds of populations it had set in motion – facilitating the dissemination of European ideas of liberty and emancipation throughout the world.

By way of the political and technological revolutions during the eighteenth and nineteenth centuries – the stage having been set by the Enlightenment – and the parallel breakthrough of the capitalist mode of production, the static social and spatial arrangements of pre-modernity were transcended. Legal codification of basic rights, such as fundamental human rights to liberty, freedom of movement, and inviolability of the person or the right to property, and the broad appeal emanating from the intellectual underpinnings supporting this revolutionary modern achievement, played a crucial role in further mobilising and accelerating the development of modern society. In addition, the values and perceptions in the minds of the populace began to change radically.² While, in pre-modernity, spatial mobility had been associated with insecurity and danger and social mobility had been plainly beyond imagination, in modernity, mobility of either type gradually turned into a common right claimed among equals. Spatially, socially and demographically this transition phase was henceforth characterised by high population growth, processes freeing the individual from traditional social bonds, migration from the land, rapid urbanisation and large-scale migration.

Modernisation of classical modernity: qualitative mobilisation

In terms of transportation, the ongoing transition from classical industrial to advanced modernity, especially since the mid-twentieth century, has been accompanied by a specific type of progressing *qualitative* development – however, not to the effect of any restraint on quantitative traffic growth. Distinctively new in the nature of this development – and this, in a typological sense, is meant by the designation 'qualitative' – is the temporal and spatial differentiation in flows of freight and passenger transport, their increasing heterogeneity and the growing complexity of transportation patterns.

2 Martin Burckhardt (1997) describes the metamorphosis of space and time perception in the course of emerging modern society from the angle of cultural semantics. In so doing, he indirectly characterises the underlying social-structural dynamic that led to expanding perspectives, opening horizons, indeed, to the thought process giving rise to the awareness of self as an individual as such – this individual is the genuine product of modernity, intellectually and, ultimately, in terms of spatial mobility as well. 'America travellers by mind' precede the actual journey to America (ibid., 158); this characterisation points to the relation between intellectual mobility, on the one hand, and actually being prepared to move or actually setting oneself into motion, on the other.

At the level of the individual, especially since World War II, transportation has developed toward increasing *auto-mobility*, in the sense of potential for self-directed movement in space as mentioned above. To the extent that ongoing societal individualisation and rationalisation entail spatial particularization and temporal asynchronisation of individual space-time trajectories, the choice of transportation technology is increasingly determined by the degree of individual autonomy and flexibility afforded by the respective technology. This is a major factor leading up to the motorcar's prevalent role in modern transport, apart from increasing prosperity and the car's symbolical expressive significance in the context of identity formation and social integration.

Eventually, once automobile technology has reached a certain level of preponderance, it pushes for further differentiation on its own, additionally stimulating demand for fast, flexible and temporally autonomous means of transportation (see Kuhm 1997). In this respect, we may not only speak of temporal structures in affinity to the automobile, but also of affinity in terms of corresponding spatial structures as well. Both temporal and spatial structures merge into a 'cage of bondage' of automobilism, which tightly links the exercise of potential freedoms inherent to advanced (and further advancing) modernity to automobile use. Having attained dominance, the technical artefact turns into a pivotal factor for sociation; the private car now becomes essential to the social integration of the individual, symbolically as well as practically in everyday life.

At this point, the mutual stabilisation of the privately owned home and the automobile plays an important role. We would fail to adequately understand traffic development in the North American post-war era, and this is true for Germany just as well, were we not to take this twofold possessive-individualistic cultural arrangement of residential and transportation technology into account. Common access to both the privately owned home and the automobile reflects a major social tendency supporting the emerging lifestyle built around these elements: their transformation from luxury goods to common goods representing the dissolution of elite privilege in favour of equality – material manifestations of social inclusion and democratisation, as it were (Polster and Voy 1991). In this light, the car and the privately owned home are not only core elements in the ideological framework supporting the Fordist model of consumption and distribution, as a specific manifestation of the capitalist mode of sociation. At the same time, as general symbols, they also stand for liberty and equality constitutive to democratic modernity, mediated by way of common participation in prosperity.

Last but not least, changes at the level of individual identity need to be mentioned. Along various lines of research it has been noted that individual identity has become ever more precarious due to the erosion of classical modern institutions, which had hitherto provided foundations of meaning. Today, identity to an increasingly lesser degree simply comes about naturally, as it were; rather, it must permanently be constructed anew. Against this background, mobility – and in this respect especially the use of the car – may be interpreted as a medium of expressive self-stabilisation. This is particularly apparent in leisure patters, tourism and young people's traffic behaviour.

Modern society is continuously changing. Thus, statements on modernity can always claim only limited historical validity. The same holds true for sociological propositions on the current mode of sociation in relation to concomitant modes of transportation. Bearing this in mind, quantitative and qualitative mobilisation were distinguished. The former refers to the fact that with the onset of classical industrial modernity a historically hitherto unprecedented boost in mobility took place in terms of sheer volume – its progressive dynamic has been lasting to date. The latter expresses the fact that in the course of ongoing modernisation the mobility of people and goods have gradually undergone a qualitative change that can be conceptualised as particularisation of space-time trajectories: people and goods follow more complex and more distinct patterns of movement, which, for this very reason, are to an increasingly lesser degree temporally and spatially synchronisable. At the value level, pronounced preferences for auto-mobility can be observed; that is, preferences for temporal and spatial autonomy in transport-related action. Thus, given choice, preferences work toward stabilising the role of the motorcar.

The genesis of transportation: the '*Wahlverwandschaft*' of modernity and mobility

When turning to the available body of research in the field of transportation sociology for explanations of the observed phenomena, we must concede that some of the most significant factors which might contribute to a more systematic understanding of the development of transportation have yet to be adequately considered. In this respect, the social origins of transportation in modern society are the core issue waiting to be addressed.

For this purpose the sociological classics will first be consulted to unearth whatever insights they may have in store. Prior to my own research, neither their considerations on transportation as a social phenomenon nor on the factors underlying its dynamic growth had been an object of analysis. This observation motivated systematically reading the classics anew from this particular vantage point. The objective was to explore the treasure trove of sociological thought for useful sources for theory-building in the field of transportation sociology potentially awaiting discovery and to examine the suitability of classical concepts for explaining the genesis of transportation under modern conditions (see Rammler 2001). Methodologically, their works were analysed from two angles: on the one hand, they were consulted as contemporaries witnessing the transition to modern society. On the other hand, they were revisited as analytical reflections of emerging modern society they had been observing (see *ibid.*).

At the outset of modern industrial society, the sociological classics were foremost preoccupied with describing and analysing the formative processes of social differentiation. A core topic of sociology at the time was the transition from traditional, homogeneous social relations with strong local ties toward heterogeneous social relations based on functionally interdependent division of labour: individuals, groups, and organisations increasingly pursued specialised and highly interrelated activities. Generally speaking, structural differentiation refers to the division of an

originally homogeneous whole into various parts, each of which possesses a distinct character and composition of its own. Structural differentiation results in activities and functions developing a life of their own, leading to autonomous functional spheres, institutions and organisations. The newly differentiated units specialise more and more toward performing certain functions. The flip side of progressing differentiation is the concomitant intensification of mutual dependency of the functionally differentiated and increasingly heterogeneous units. The English social theorist Herbert Spencer described this phenomenon of functional interdependence in his own vivid way:

We propose to show, that this law of organic progress is the law of all progress. Whether it be in the development of Society, of Government, of Manufactures, of Commerce, of Language, Literature, Science, Art, this same evolution of the simple into the complex, through successive differentiations, holds throughout. From the earliest traceable cosmic changes down to the latest results of civilisation, we shall find that the transformation of the homogeneous into the heterogeneous, is that in which Progress essentially consists (Spencer 1972 [1857], 40).

[Evolution] is a change from an incoherent homogeneity to a coherent heterogeneity, accompanying the dissipation of motion and the integration of matter (Spencer, in *First Principles* 1862, as quoted in Peel 1971, 137).

As indicated in the notion of 'coherent heterogeneity', it follows that while units are undergoing differentiation, they must, at the same time, be integrated to ensure the unity of difference. All the classics, to a larger or lesser degree and using different terminology, applied some kind of dialectical concept of interaction to account for interrelation of this type:

- the general nexus of differentiation and integration (in particular Herbert Spencer, Emile Durkheim, Georg Simmel and Norbert Elias)
- the dialectics generating specific institutions, such as the monetary economy (Georg Simmel), and their manifold recursive effects upon the social contexts from which they emerged and in which they functioned
- the psychogenesis of specific attitudes due to the pressures of sociogenetic interdependence (Norbert Elias, Georg Simmel) and the latter's dynamic impact in terms of further intensifying interdependence.³

With regard to transport development, the most significant conclusion to be drawn from the secondary analysis of classical modernisation theories relates growth in transport to social differentiation: viewed from the perspective of spatial and socio-communicative effects, the dramatic increase in interdependency – resulting from the dialectical interplay of differentiation and integration that had set in with modernity – entails progressive growth in transportation; the latter is both a condition and a consequence of interdependency. The co-evolution of progressing interdependency and transportation growth takes on the form of mutually enhancing factors driving

³ See the respective references at the end of this chapter. For a detailed discussion and further references see Rammler 2001, 35ff.

a growth spiral. Transportation represents a condition for modernisation inasmuch as it serves to integrate societies experiencing differentiation in the wake of modernisation; differentiation can take place only to the extent that transportation systems provide the necessary means of integration. In this light, a shift in perspective seems justified: I suggest relinquishing the common interpretation of transportation as a predominantly dependant variable and the result of social differentiation in favour of its reassessment as a necessary and independent variable of social development. Drawing on the – indeed contentious – tradition of early sociologists of employing organic metaphors, we may cast this relationship into the following imagery for the sole purpose of illustration: the 'body of modernity' is unable to grow and develop if the integration of emerging spatial distances is not ensured. This body evolves by concomitantly developing and incorporating suitable elements to assume the integrative function on an increased scale. Explanations of social change need to accommodate the nature of these component parts and the possible 'lives of their own' they may take on. The possibility that transportation may induce social transformation by unfolding such a life of its own has implications far surpassing any conclusions arising from the simple fact that transportation by way of integration is a necessary condition for social development. To shed light on the issue, above all, different modes of transportation, transportation technologies and transport-related motives have to be explored empirically as to the inherent potential for this kind of social impact. The results thus being brought to the fore need to be related to sociological theory, which in turn may well require adjustment to accommodate the findings.

All sociological classics studied employed some kind of dialectical approach to conceptualise developments of modern society – each with different emphases and referring to different aspects. There is good reason to do so. Thinking in terms of reciprocal effects facilitates readjusting one's perspective toward a process sociology in which structures are no more than temporarily stable solidifications of historically changing modes of relating social units. If we think of relating social units as a problem of unity of difference, efforts to maintain unity must keep pace with any progression of difference. Or put conversely, difference may progress only to the extent that efforts at maintaining unity improve in terms of efficiency, flexibility and scope. Technisation of the transportation system and the development of money as a social medium are prototypical cases to the point. From this vantage point, transportation, communication and money systems may all be viewed as means of relating social units to accommodate differentiation, historically brought forth by society in the course of co-evolution. Differentiation to be accommodated was, first, production based on division of labour, then role and stratificatory differentiation building on such production processes, and, finally, the differentiation of functional subsystems.

The historical starting point of differentiation, according to Adam Smith (1994 [1789]), is the anthropological urge to act and exchange; in the view of Durkheim, Simmel and Elias, demographic pressure and its interplay with the need to specialise in order to survive historically lie at the root of differentiation. Once underway, these differentiation processes – under conditions of competition and additionally fuelled by transportation technology and money as integrative media – take on the nature

of a recursive, self-reinforcing expansive nexus of relations further augmenting traffic increase. Early on, Spencer clearly perceived the influence the development of transportation infrastructure would have on the development of the social body.

Moreover, the vast transformation suddenly caused by, railways and telegraphs, adds to the difficulty of tracing metamorphoses of the kinds we are considering. Within a generation the social organism has passed from a stage like that of a cold-blooded creature with feeble circulation and rudimentary nerves, to a stage like that of a warm-blooded creature with efficient vascular system and a developed nervous apparatus. To this more than to any other cause, are due the great changes in habits, beliefs, and sentiments, characterizing our generation. Manifestly, this rapid evolution of the distributing and internuncial structures, has aided the growth of both the industrial organization and the militant organization (Spencer 1969, 165).

In the following, the genesis of transportation in the wake of modernisation will be approached from this angle of the dialectic of differentiation and integration. In so doing, the notion of '*Wahlverwandtschaft*' will be introduced, which refers to a specific kind of intrinsic commonality in the nature of modernity and mobility. As the argument proceeds, transportation mobility will be freed from its status as a sociologically unexplained precondition implicit to modernisation and spelled out as a social transformative force of its own.

The idea of *Wahlverwandtschaft*⁴ (elective affinity) was introduced to sociology by Max Weber to conceptually account for the pronounced similarity in nature of Protestantism and the capitalist ethic, for the specific affinity between them and the fact of mutual advancement. Employing this concept, the emergence of capitalism was to be explained. First of all, Weber was interested in finding a middle course between causality and coincidence. He sought to avoid claiming a strict causal relation such that the Protestant ethic had given rise to capitalism as an immediate effect. On the other hand, he did not want to settle for suggesting a merely coincidental relationship between the economic success of the Protestant-Calvinist population and their religious outlook. Secondly, the notion of *Wahlverwandtschaft* allowed him to conceptually assimilate the fact that the new economic principles in turn stabilised Protestantism, which again entailed effects conducive to the development of capitalism (see Weber 1988 [1920], 17–236). Thus, Weber was interested in conceptually capturing a relationship of reciprocal interaction and mutual effects – put more generally, in ways of thinking in terms of dynamic relations.

Taking up Weber's idea, I propose sociologically approaching the genesis of transportation accordingly: it may be accounted for in terms of a *Wahlverwandtschaft* between modernity and mobility. This approach avoids fruitless debate on the historically and systematically irresolvable problem of whether traffic is to be considered a condition or consequence of modernity. Recursively affecting each other, they are always both. *Wahlverwandtschaft* is a figure of thought that, on the one hand, dismisses strict causality and inescapable logics of development and, on

4 On the concept of *Wahlverwandtschaft* see Weber 1988 [1920], 49, 83, 183, 190, 202ff; Habermas 1981, 466; Loo and Reijen 1997, 25. On its etymology and the (literary) history of its use (see Goethe's novel *Die Wahlverwandtschaften*) see Wilpert 1998, 1139ff.

the other, assumes a relationship of mutual advancement, as a condition necessary, if not sufficient, for development.

With this in mind, the following set of propositions will outline the genesis of transportation as emerging from the interaction of differentiation and integration.

(1) *Modernisation as structural differentiation*

Put pointedly, modernity stands for structural differentiation. Differentiation, however, is only possible due to a complementary process of integrating the differentiated roles and social functions. The development of society – maintaining its unity in the process while further progressing from the respective level achieved – can take place only to the extent that differentiation is accompanied by a parallel process of integration. Integration in this context refers to a particular mode of institutionally, organizationally, culturally and technologically bridging separation that allows society to maintain and even to strengthen its functionality and cohesion. Here the emphasis lies on conceptualising differentiation and integration as temporally parallel, tightly intertwined and mutually constitutive processes, which ought not be misconceived as a temporal sequence as possibly suggested by sequential order in argumentation.

(2) *Transportation as spatial integration of social differentiation*

Spatially, societal integration is accomplished by transporting persons, goods and information. Ergo: transportation integrates. In this respect, it performs a structural-functionally essential service to society. The technico-organisational transportation system enables spatial integration. As a condition for integration, this system is itself a product of co-evolution of scientific-technical progress and increasing social interdependence referred to as *technisation* of the transportation system.

(3) *The technisation of transportation as condition and consequence of integrating structural differentiation by way of transportation*

On the whole, the co-evolution of technisation and sociogenesis can be pictured as an interplay of embedding and disembedding: the initially contingent and later systematic embedding of transport-related artefacts and infrastructures into contexts of social systems and social action – this 'expansion of the technical apparatus' (my translation) in Werner Sombart's words (1927 [1902], 123) – leads to the disembedding of these contexts from traditional ties in space and time. This disembedding is in turn met with new efforts at embedding by means of transportation technology. In other words: the body of modernity is growing and changing by way of incorporating technical components. Transportation infrastructures are, in a way, both skeleton and nervous system of modern industrial growth societies. One can only be altered to the extent that the other also undergoes change; and this process is programmed for growth as long as modernity's core institutions – capitalism, democracy and scientific-technical rationality – are not called into question.

While the views of the writers of the sociological classics were shaped by railways, we need to take into account that in the meantime the automobile and increasingly the airplane have transformed the technical foundation underlying transport-related integration of structural differentiation and will continue to do so; this has led to respective changes of type in spatial and social differentiation. In this context, Günter Burkart (1994) has proposed a line of reasoning based on individualisation and integration theories. He attempts to explain the prevalence of the technology 'automobile' by linking three value dimensions constitutive to modernity and to the modern individual: social mobility, autonomy and individuality. Once a certain degree of prevalence is reached, the technical artefact itself turns into a pivotal factor of socialisation such that, in this case, the private car becomes symbolically as well as practically essential to the social integration of the individual. Recently, Heine, Mautz and Rosenbaum (2001) empirically substantiated the deep roots the automobile has struck in everyday life. Their work closed a gap between the (by necessity) rather abstract explanations of automobilism's irreversibility in systems and structural theories (see Kuhm 1995 and 1997), on the one hand, and action theory, on the other, by vividly depicting how the dynamic at the systems level specifically affects the individual level and how the automobile has been incorporated as a mainstay of everyday culture.

While the car facilitates ever-increasing spatial differentiation and temporal flexibility, the airplane dramatically expands the global range of interaction – especially due to favourable framework conditions. Along with worldwide communication networks, the aircraft is the actual foundation of globalisation in terms of transportation technology, even though railways and shipping had already supported globalisation in former times. However, due to overlapping effects of different transportation technologies, it should prove difficult to precisely delineate distinct types of spatial differentiation. In this respect, more research is called for in the fields of sociology of transportation and sociology of technology.

(4) The psychogenesis of transportation as a condition and consequence of traffic growth

Exogenous, 'hard', tangible technical infrastructure to sustain the functional conditions of modern transportation has its endogenous counterpart in 'soft', intangible, but no less enduring mental structures, perceptive and self-regulatory capacities. Just as the former needed to be reconstructed to accommodate changing circumstances, so did the latter. Accordingly, traffic growth is complemented and positively reinforced by 'psychogenesis' (Elias 1976a; Elias 1976b) of 'appropriate' traffic behaviour and a corresponding sense of time. In addition to the modern enterprise and the bureaucratic organisation, rail-bound mass transportation historically had been another 'social locus' for modern 'resocialisation' – in this case, of course, functionally related to transport; behaviour had to be redirected to accommodate new transportation system requirements (such as timetables and schedules). In the meantime, modern road traffic has become the most prominent 'social locus' for conditioning functionally relevant, transport-related spatial behaviour (for example, traffic rules). Apart from its indirect and rather unspecific psychogenetic impact as a necessary link in the chain

of interdependency-enhancing 'sociogenesis' (Elias 1976a; Elias 1976b), modern traffic, as locus of reorganising behaviour, also has a very immediate and specific impact by generating the preconditions for its own growth. Each generation anew is subjected to respective 'social conditioning' at specialised socialisation agencies (such as road safety education).

(5) Integration through transportation results in further differentiation

To the extent that – on the basis and within the confines of technology and psychogenetic civilisation of the time – transportation serves to integrate social differentiation, it becomes a source and motor of further differentiation of its own. By driving differentiation through integration, the foundation is laid for ever more traffic growth and transcending ever more spaces. For, with every step toward further differentiation, the interdependence of the functionally differentiated and heterogeneous units will grow as well; a phenomenon described by Elias as a process in which social dependency and linking human activities increasingly lead to chains of action reaching beyond the individual. Increasing interdependence forces more integration, thus entailing growing communication and transportation needs.

(6) Expanding the range of accessibility by cultural unification

In accessing distant destinations, a special case of transportation- and communication-mediated integration is touched upon that affects the cultural sphere. Cultural homogenisation on a global scale can, in part, be attributed to increasingly ubiquitous accessibility facilitated by modern transportation and communication technology. Hitherto culturally distinct worlds become increasingly more imaginable, controllable and accessible to the individual due to improved command or at least medially conveyed knowledge of their autochthonous semantics. Barriers to, for instance, taking a vacation trip abroad or initiating business contacts are lowered. This expansion in the range of cultural accessibility induces traffic when combined with necessary transportation technology and sufficient economic resources. Emphasising obvious tendencies towards convergence and homogenisation of cultural symbols and lifestyles is not to deny that culturally distinct worlds and spaces continue to exist. In the light of ongoing rationalisation, detraditionalisation, demystification and related loss of meaning on the part of modern Western individuals, they may even attain heightened significance in the future (see Beck 1997, 80). Ultimately, it seems more plausible to assume a parallel existence of homogeneity and heterogeneity as Robertson (1998, 192) does in his concept of 'glocalisation'. From this perspective, the search for meaning within the culturally distinct – from the Indian ashram to hiking and fasting in the Himalayas – can be viewed as a pull motive for tourism to distant locations. In this respect, barrier-reducing homogenisation and still-existing cultural heterogeneity providing respective motivations combine to work in the same direction. In addition, the horizons of desirability, too, are expanded by disseminating worlds of imagination on an international scale by way of media, such as television; that is to say, locations turn into destinations in the first place because they have become imaginable – images present in the minds of the travellers-to-be.

Shaping transportation: modern transportation policy trapped in a 'cage of bondage'

As argued above, transportation is neither simply consequence nor just cause of modern societal development. It is always both. Put concisely, transportation is a force that holds the modern world together while driving it apart. As such, it is *essential* to the development of modern society. Specifically, modernity is characterised by processes of differentiation resulting in phenomena of quantitative and qualitative mobilisation that have become manifest as transportation growth and particularisation and individualisation of space-time trajectories. In historical perspective, an increasing number of passengers and a growing volume of goods not only cover ever-farther distances, they also follow patterns of movement that are increasingly more complicated, more specific and, for this reason, in terms of time and space less synchronisable, thus less suitable for 'bulk transportation', as it were.

However, the relation between modernity and mobility is double-edged: expanding opportunities are accompanied by growing constraints, options entail agony. Negative externalities of mobility have adverse impact on the societal context from which they have emerged – increasing mobility produces growth pains. Thus, mobility today has become 'reflexive'. The notion '*reflexive mobility*', on the one hand, expresses the fact that modernity is endangered by its own success as a result of unintended side effects arising from the mobility necessary for just this success. Reflexive mobility, on the other hand, means that this circumstance has come to the fore as matter of public debate; its adverse effects have increasingly become a focal point of discourse and political conflict (see Beckmann 2001; Kesselring 2001). New social actors have formed and are pushing for a solution in terms of restructuring mobility. Transportation policy today can be viewed as a prototypical case for general controversy in 'risk society' (Beck 1992) over reflexive modernisation.

A crucial question in this respect is: Does *Wahlverwandtschaft* pose an irresolvable dilemma? Or can feasible solutions to satisfy demand for flexible and autonomous mobility be imagined while addressing the problem of negative externalities? Max Weber once made a statement to the effect that modernity is not like a cab that one can have stopped at one's pleasure. This image depicts the fateful and inescapable nature of modernity in Weber's interpretation: the 'iron cage of bondage', the iron cages of bureaucracy and capitalist economy from which there is no escape until the last bit of fossil fuel has been burned (Weber 1988 [1920], 203; see Peukert 1989). If we take seriously the line of reasoning so far presented, we must assume that just as we cannot flee from modernity, we cannot escape emerging needs to cover space and hence transport-related consequences. Freedom of movement, unhampered access to communication and limitless transcendence of space belong to the great 'promises' of modernity. At the same time, they are conditions for realising social inclusion, democratic ways of life and modes of participation, specifically modern, market-based and profit-oriented modes of economy and, finally, common prosperity based thereupon. Accordingly, a certain level of modern development, by necessity, appears to be inextricably linked to specific societal and individual needs to cover space – in terms of requiring a certain quantity as well as a specific quality. Processes

of extensification, growth in scale, transcending economic, political and cultural spaces will continue, possibly into outer space, as far and as fast as technological progress allows. New access to economically exploitable resources will further push this expansive dynamic toward more distant spaces. Under these circumstances, it is only a matter of time until processes that increase interaction and enhance interdependence in now-expanded spaces, thus stimulating growing flows of traffic, are again intensified.

Put pointedly, this leads to the normatively unpleasant, but nonetheless realistic insight that demands for radical traffic reduction are incompatible with the fact of *Wahlverwandtschaft*. Under conditions of competitive democracy that forbid simply issuing authoritative, 'ecocratic' directives, modern transportation policy indeed appears to be trapped in a 'cage of bondage'. This 'confinement' restrains political feasibility of strategies and measures directed at sustainability that threaten to seriously disrupt the growth dynamic inherent to the relation of modernity and mobility. The price to be paid for such far-reaching intrusion would be political demise and loss of power. It is time to challenge the myth surrounding transportation policy that political actors are free to act as they please, and, therefore, that current transport-related problems are simply the outcome of either interested action or wilful inaction. To the contrary, political dilemmas, as lie at the core of transportation policy, largely result from the force of modern interdependence. Society's 'body' – to employ the metaphor once more – as an assembly of highly interdependent and highly specialized 'body parts' confronts political volition with the persistence of structure. Once fully developed, great effort is required, huge obstacles need to be overcome and considerable dangers must be mastered in order to decompose it again. If at all, this would be feasible only if supported by widespread social consensus – having emerged from a broad debate in all spheres of society – on willingness to bear the profound consequences and to distribute them fairly. Given contemporary political culture and the still deep-seated adherence to a vision of material prosperity, such a scenario does not appear overly realistic. Nevertheless, contemporary political debate on alternative conceptions of transport mostly tends to either underestimate possible consequences or to hardly consider them at all. What modernity do we want – or do we want modernity at all? This simple yet fundamental question ought to lie at the outset of any debate on compatibility of transportation and sustainability. To date discourse on transportation policy has been lacking such a consistent and radical focus. Should we indeed want to debate this issue, the pivotal task will be to find new modes of political discourse and new arenas for negotiation suitable to accommodate risk society's changed framework conditions and related problems of governance plaguing classical political institutions. The realm of transportation and mobility not only confronts modern societies with pressing problems in need of solution, but due to the close linkage of modernity and mobility it virtually represents a prototypical testing ground for the feasibility of ecological modernisation as well.

Let us assume that, for the above-mentioned reasons, we do not simply want to stop Weber's cab; that is, we are not principally calling modernity into question with its existing and prospectively increasing mobility needs and transportation requirements. Let us further assume that we nevertheless do not want to simply sit on our hands and acquiesce to fate. In this case, there is little choice to attain

a more agreeable state of affairs other than developing sustainable alternatives to the prevalent traffic carriers. In the light of the fact that auto-mobility of persons and commonly expected ubiquity of goods and information lie at the core of modern existence – along with all the underlying structural, freedom-related and symbolic-expressive causes – the name of the reform game can only be *functional equivalence*.

What does this mean? As implied in the term, it is a matter of the *function* associated with a technical artefact. Should it prove feasible to successfully provide the same service by other means – that is, functionally equivalent – then it should theoretically be possible to replace a technology, in this case the utterly dominant motorcar, while retaining freedom of choice. The core condition for successful substitution is ensuring auto-mobility as the essential service provided so perfectly by the motorcar. The currently frequently discussed strategy of systematically linking traffic carriers according to their respective systemic advantages (see Schöller and Rammler 2003) will play an important role in this respect, especially in agglomerations experiencing catch-up mobilisation. Moreover, huge technical advances are still possible, especially with regard to improving the resource-efficiency of individual components of the overall transportation system. Such improvements, for instance, could be directed toward innovative drive systems supporting *post-fossil mobility*. This, of course, would require politically providing supportive framework conditions. The tremendous potential for technological progress, yet to be tapped into, may justifiably lead us to expect notable success in de-linking performance from negative externalities similar to the improvements achieved in the energy sector (see Rammler and Weider 2005). *Wahlverwandtschaft* notwithstanding, there is indeed considerable scope for action short of radical structural disruption. Even though conflict potential at this level of technological optimisation is still plentiful, transportation politics nonetheless must be held responsible for making decisive use of its opportunities. The technological vision of post-fossil mobility definitely falls within the scope of such opportunities.

Wahlverwandtschaft does indeed point to the fact that mobility is essential for modern society to function. Yet, this does not render any specific technology indispensable to that effect. Put pointedly: by no means is mobility unacceptably constrained by a 130 km/h speed limit, and, while minimising environmental impact, highly fuel-efficient engines or solar-energy-based, hydrogen-driven vehicles ensure mobility just as well. The higher the degree of overall 'fit' such a mobility system manages to develop, the less resistance is to be expected in implementing measures to this effect: it should be easier to do without all-purpose vehicles – which by design are principally less sustainable due to size, weight, material intensity, engine design, range, fuel consumption, etc. – and to establish alternatives on the market, given a perfectly integrated transportation system. Such a system will require interfaces, designed for optimal fit, to facilitate transfer between various traffic carriers. And it must provide a high degree of flexibility and spatial autonomy. On the part of political actors, any success in advancing post-fossil mobility will require considerable courage, finesse in negotiations and resolve beyond short-term opportunism. Within a consistent framework combining innovations at the product, user and systems level, various policy elements could conjoin into a consistent and proactive technisation

strategy promoting post-fossil mobility as the basis for a sustainable transportation system. Elements that come to mind are: supply-side product standards, demand-side market launching aid, fiscal instruments promoting product innovation, public procurement policy and, above all, research policy.

Successful steps toward post-fossil mobility bear the potential of equipping so-called developing countries with ample latitude for necessary traffic growth. Moreover, these countries would be provided an opportunity to cut short the protracted learning process of industrial nations by avoiding investment in unsustainable infrastructures and transportation systems to begin with. Supported by technology transfer, availability of intermodal strategies and alternative mobility concepts appropriate to regional needs might allow them to 'enter' transportation development at a point beyond the automobile age.

However, at the end of these considerations, it needs be emphasised that this technisation strategy, too, ultimately abides by the logic of *Wahlverwandtschaft* of modernity and mobility. Post-fossil mobility remains by its very nature a technological means of integrating structural differentiation and, therefore, in accordance with the concept of *Wahlverwandtschaft*, a condition for future growth in demand for transportation.

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