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Plugging in: Power sockets, standards and the valencies of national habitus

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Abstract

This article examines why it is not possible to plug a British plug directly into a Dutch power socket. The author traces the development of the British Standard BS1363 plug-socket assembly and compares it to the European arrangement in order to demonstrate how the 'banal nationalism' of everyday life is formed and can be seen to be manifest in everyday utilitarian artefacts. A concept of nationhood that is formed in terms of 'national habitus' is elaborated, the nation is envisaged as being constituted by the socio-technological infrastructures upon which it depends, which are established as being formed by the governmentalities that have allowed them to come into being, and it is suggested that such a system will operate at a range of scales or valencies. By tracing the history of the two examples given, the intention is to demonstrate how each national habitus depends upon a particular technical development shaped by social forces.

Keywords

electricity, nation, plug, standards, valency

Introduction

In a cheap hotel room in Amsterdam I am trying to finish a presentation. It is late at night and the piece has to be ready for the next day. I have nearly finished, but there are a few important tasks to complete. On the screen of my little netbook, a message-box appears: 'Plug in or find another power source.' As I have done a thousand times before, without really taking my mind off the work I am trying to do, I take the cable from my bag and slide the power connector into the socket on the side of the machine. I reach down the

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cable and find the plug. Looking up, I suddenly stop. I am staring at two round holes in the wall and I am holding a plug with three flat rectangular pins. I have no adaptor.

Why did this happen? What made these two objects, both of which perform the same function, so different in their national contexts? Britain and the Netherlands are not far apart, either geographically or culturally, yet this simple piece of technology, an alternating current (AC) plug-socket assembly, which I need to live my daily life, that works perfectly well at home, ceases to function at all when I cross the border. If there is no adaptor to marry-up the two systems, I am excluded in a way that is more material than symbolic, even if it is revealed as rich in meaning in the process.

A plug-socket assembly is a device that allows electrically operated machinery to connect to the mains power supply in a building. It comprises the male plug on the appliance, which has metal pins that fit into the female socket connection tubes housed in the wall. This apparatus thus allows for the conduction of electricity from a large-scale infrastructural utility supply to an individual appliance. In the scenario described above, my interaction with such everyday technology is revealed to be implicit in a much bigger entity. Such a stoppage, a small-scale action baffled by a conflict of protocol, of 'how things are done', speaks not only of how such material interactions create the conditions that give rise to the subjective sensation of belonging, but also indicate how this sensation is dependent upon the infrastructure I inhabit.

This article investigates how these two plug-socket assemblies came to be as they are; it examines the way in which small-scale everyday acts are dependent upon larger grids of action and power (in this case, quite literally); and though there is not space here to discuss in detail the phenomenological terrain formed by the interaction of such scales, the intention is to demonstrate how unnoticed everyday things, such as the humble plug, act to constitute a sense of being part of the nation, in a way that is dependent upon the material and socio-political history that shaped them. Despite the fact that the earliest manifestation of standardisation took place in the USA (a plug-socket standard was established there in 1917; see Schroeder, 1986), for the sake of clarity this discussion is limited to the Dutch and British examples I encountered in my moment in Amsterdam.

With the British Standard 1363 electrical plug-socket assembly, it is easy to identify what code of conduct resulted in the metal and plastic arrangement we have now. There is one document, *Post War Building Study 11: Electrical Installations*, drawn up by a central government committee in 1944 in the run-up to the nationalisation of electricity provision in the UK, that can be identified as the source of the strict specifications for the polarised, earthed, three-pin, appliance-side-fused arrangement that is in use today (MoW, 1944: see Figure 1). Examination of the circumstances that led up to the drafting of this report and the specifications it lays out thus make it possible to see how the British standard plug-socket assembly was brought into being by the explicit agency of the state at a point in history where the safety of users was regarded as a defining factor in its design. The initial electrification of the Netherlands depended not upon domestically produced technology, but French and German equipment derived from American standards (Buiter, 1997; Jonnes, 2004; Van der Vleuten, 2010), and was shaped by a range of commercial interests administered by municipalities with a high degree of fiscal and strategic control (Bos, 2010; Doyer, 1916; Vereeniging van Directeuren van Electriciteitsbedrijven [VDEN], 1926). The standard socket also appeared at a different

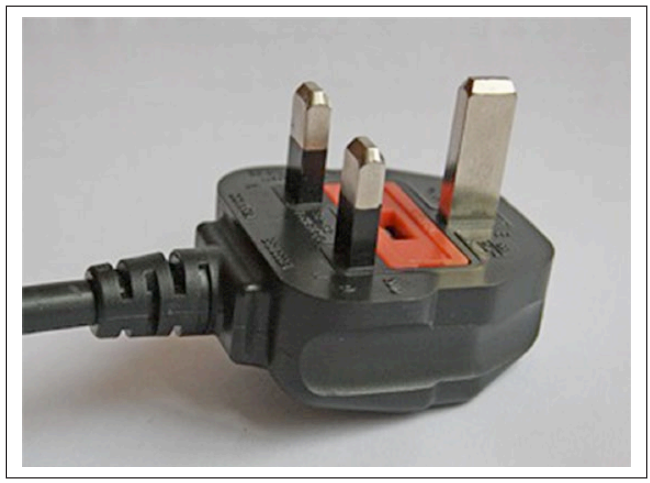

Figure 1. The British BS1363 flat three-pin, fused plug. © Photograph: Damon Taylor.

time to the standard plug (IECEE, 1963[1957]). Consequently the socket I found in my hotel room in the Netherlands was less directly defined by the action of central specification, a quality that is discernible in the strangely unsatisfying relationship between the simplest form of plug and the larger socket housing into which it fits (see Figure 2), which reveals the absence of central state control in its production. The pressures that mitigated for the Dutch plug-socket assembly are thus less directly identified and the evidence has had to be adduced from contemporary reports and secondary sources that deal with the process of electrification (Bos, 2010; Buitter, 1997; De Rijk, 2009; Doyer, 1916; Van der Vleuten, 2010; VDEN, 1926). Thus the approaches to the standardisation of the connection of appliances to the wider infrastructure, that is the governance of conduction at the domestic level, so to speak, can be seen and experienced in the devices with which we have been left. Through this comparison it is proposed that the electrical plug-socket assembly can be understood as an example of 'banal nationalism', whereby such small and unnoticed things take the form they do because they are the product of much larger scale processes; that something as abstract as nation is present in the day-to-day materiality of an electrical plug; that modes of conduct and government are coded into the tangible things we use to live our lives, and these things take the form they do for historical reasons.

Infrastructure and the banalities of national habitus

It is very difficult to imagine modern life without electricity. As is illustrated by the situation that begins this article, much of what we do on a day-to-day level is dependent upon the supply of electricity, but it is only when such availability is frustrated that it comes into consciousness. Daily life in contemporary culture is reliant upon a whole technical infrastructure that supplies electricity, of which, in normal conditions, we tend to be unaware. Such an infrastructure can, in Thomas Hughes's (1983)

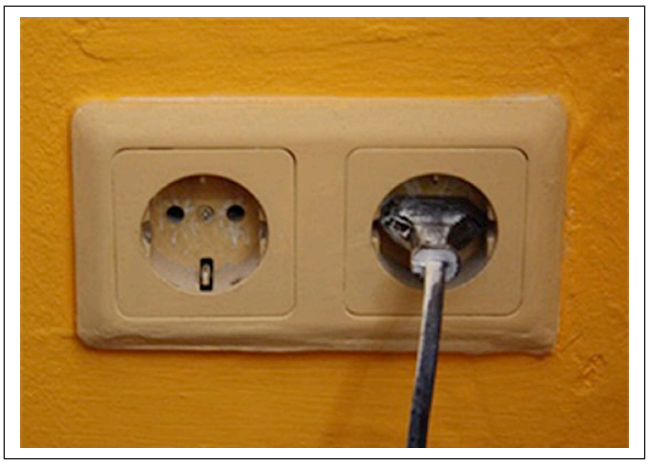

Figure 2. The Dutch 'Schuko' two-pin socket with a 'Europlug' inserted. © Photograph: Damon Taylor.

terms be regarded as a Large Technical System, the parameters of which can be understood to include not just the mechanics of the system, the generators, cables and fuses and the like, but also the users, decision makers and social effects of the operation of the system. This is because the technological apparatus we live with to a large degree establishes the conditions of how we may act and behave. As Brian Larkin (2008: 5) observes, infrastructures 'are the material forms that allow for exchange over space', and are thus the physical structures that allow for much of our social lives beyond that which is tangibly immediate. Paul Dourish and Genevieve Bell (2007: 417) argue that infrastructure and everyday life are established as coextensive, in that infrastructure as a concept 'encompasses not just technological but also the social and the cultural structures of experience'. Yet it should be noted that such an 'infrastructure of experience', in its broadest sense, is dependent upon the actual embedding of a range of material infrastructures into everyday space that 'shapes our experience of that space and provides a framework through which our encounters with space take on meaning'.

Belonging is experienced at a range of scales. The closest register of home is arguably the domestic environment, which is peopled by individuals who are intimately known to us. There is also the wider sense of the community, which has broader geographical range, and those who make up this perceived grouping have varying degrees of status in terms of the extent to which they are known. The nation, then, is a scale of perceived community that coincides with the legal and bureaucratic structures that could properly be said to be of the state. Max Weber's (1978: 181) observation that there is an important distinction between the state and the nation, whereby the state is a political institution, the nation a cultural community, does not exclude the intersection of these entities. As Peter Taylor (1994: 156) has argued, the nation state emerged in the 19th century as a way of transforming populations into societies, more or less cohesive social groupings, constituted by practical and ethical regulatory systems. Thus infrastructural networks

such as communications facilities, transport links and of course utilities came to be essential mechanisms of power in the constitution of the modern nation state. As Manuel DeLanda (2006) observes, it was the establishment of the material infrastructure, the literal wiring-up of the nation, that allowed it to come together as a functional entity, and as Ernest Gellner (1983) notes, the establishing of cultural norms that make up the nation can only occur in a mass culture, and such a form of society develops as a feature of modernity. That is, it is the technical elaboration of the state as a physical entity that creates the conditions in which the nation as a concept and a sensation can be narrated and internalised by individuals.

At the scale of everyday interaction, 'nation' is not just an abstraction, it can also be apprehended as an iterative physical phenomenon. Social existence depends upon the material; we use things to perform the actions and routines of daily life. As Richard Johnson (1993: 168) has argued, the nexus of meanings that constitute the nation, in its multifarious versions, depends on a supporting structure of common practices: 'the experience of waged and domestic labour, the preparation and consumption of food and drink, the forms of intimacy, leisure and sociability in family, community and region' that in certain circumstances are 'culturally nationalised' and 'made to mean a nation'. Yet beneath such varying degrees of explicit meaning making lie more hidden and implicit forms of association and attachment.

Michel Foucault (2001: 341) suggests that the exercise of power can best be understood not simply as the exertion of force from above, but as control through the 'conduct of conducts'; this is then a 'management of possibilities' whereby what can be done and the manner in which it can be achieved serve to determine the forms that life can take. For Foucault, such 'governmentality' is not just about the nature of formal state control (although it includes this), rather it is concerned with matrixes of strategies that have developed throughout modernity to deal with what Mitchell Dean (2007: 103) describes as the 'emergence of a set of problems specific to the issue of population'. Thus, as Dean observes, any attempt to study such a phenomenon must pay attention to 'the actual rationalities and techniques' through which government is achieved, as the way in which the conduct of conduct is established, and indeed establishes particular ways of being in any specific circumstance.

The valencies of everyday life

That which is most revisited in the course of everyday life, the things that we rely upon to live our lives, often remain unnoticed (Highmore, 2001). This is not least because of their very ubiquity and, as Leigh Star (1999: 377) notes, 'many aspects of infrastructure are singularly unexciting'. Consequently, we tend not to register the existence of things such as mains power sockets until they are needed, yet they become objects of extreme attenuation when they are absent. In this way, they are the substrate of the physical landscape of subjectivity that makes us feel we belong somewhere. There is a collectivity in what we experience, and most of this is a form of what Michael Billig (1995: 6) talks of as a 'banal nationalism', whereby the mechanisms of the nation operate at the level of the 'endemic condition'. Such are plugs and power sockets. They are just what we live with, but in this they are what makes us feel we belong. It is an example of 'what we do here'

that is so everyday, and thus seemingly a natural element in our lived experience, that we do not notice the specific form that its functional solution takes within the ethos of the milieu in which we encounter it. This is not then to argue for a simplistic form of technological determinism whereby material technologies absolutely delimit the nature of social action. Rather it is to suggest that there is a dynamic relationship between the infrastructure of life in its everyday manifestations and the internal life-world of the subjects who inhabit such terrain.

Although it is through the work of Pierre Bourdieu (1987) that the concept of habitus has gained prominence in the UK, it was previously elaborated in the context of national belonging by Norbert Elias (2000[1939]). As Giselinde Kuipers (2011: 3) observes, the term habitus refers to the learned practices and standards that have become so much part of ourselves that they 'feel self-evident and natural'. In this context, national habitus is useful in the analysis of localised ways of being, those cultural practices that 'end at the border', because it makes it possible to ask the question, as Kuipers does: 'under what conditions does such a national ground-tone in behaviour, institutions and standards emerge?' (p. 4).

With an everyday object such as the plug-socket assembly, the confluence of technical possibilities, regulatory practices and cultural norms that have served to form the object's life-course means that it is of a specific type in a particular place; there is a cultural and social history to any such artefact that accounts for its nature in any location. In mapping this process and its effects it is then necessary to identify the nature of the interactions between the elements in play. Erik Van der Vleuten (2009) observes that the study of Large Technical Systems allows not just for an understanding of their workings at the level of mechanics but also their sociotechnical functioning. This is useful because it breaks down the artificial distinction between people and things, or rather it regards people as things within the operation of the system. To such ends, Bruno Latour (2007: 63), in describing the principles of Actor-Network Theory, suggests that all the constituents involved in any interaction, whether human or non-human, can be regarded as actors or 'actants', which then collectively constitute the whole as a network of interdependent and interacting agencies. Thus the people who inhabit a space can be seen as the social actors who operate in this arena; yet, in Latour's terms, the material elements with which they interact can also be understood to be acting agents – to be actants – in the constitution and performance of power relationships, which then happen at a range of scales or valencies.

People and tangible things are not the only actants in any given situation; social life is also made up of social entities such as nation, and the individual subject is not the smallest component in any interaction (DeLanda, 2006: 32). Thus the set of actants that make up this field of activity and interaction can be understood to include both the nation as a large entity, the individual selves that perceive themselves to be acting in this arena, and all the components of the technical apparatus, from the biggest alternator to the smallest fuse. However, these parts exist at differently ordered valencies. Actants that function at the level of large-scale industrial production fit with other actants of this valency; elements that function at the level of everyday use then marry with other parts of this scale. What then is necessary for the functioning of the whole is that there should be a

congruence between the valencies, an ordering logic which allows for the levels to interact, thus making it possible for the system to operate as a single entity.

The national machine

AC power is a form of electrical conduction whereby the flow of the current constantly reverses back and forth from positive to negative; this is then in contrast to direct current (DC), in which the current flows only in one direction. We have AC power sockets in our houses because in the early days of electrical generation, in the latter part of the 19th century, this form of supply was found to have an advantage over DC. Early DC generation systems were only suitable for small-scale, localised production. Since AC was produced at a higher voltage it could be transmitted over larger distances and was thus suited to the supply of electricity as a mass utility.[1]

In the late 19th century, the electrification of Europe was being driven by companies using technology developed by the American inventor and entrepreneur Thomas Alva Edison, through the French-based arm of his organisation, Continental Edison, and the German company, AEG (Buiter, 1997; Hughes, 1983; Jonnes, 2004). As Edison noted, electrification was a complex process, both in technical and business terms, since for the system to work there needed to be standardisation across the network. He observed:

> It was not only necessary that the lamps should give light and the dynamos generate current, but the lamps must be adapted to the current of the dynamos, and the dynamos must be constructed to give the character of current required by the lamps, and likewise all parts of the system must be constructed with reference to all other parts, since, in one sense, all the parts form one machine. (Edison cited in Carr, 2009: 26)

Thus each component was not to be conceptualised and designed as a discrete entity in itself, rather it had to be thought of as part of the machine as a whole. This mechanism then had to be integrated into the daily life of those who would use such power, if power was to be conducted into the home. As Dean (2007: 82) notes, conduct can be used both as a noun and a verb. As a verb, it is taken to mean 'to lead, guide and direct'. As a noun it is suggested that it implies 'behaviour, action, comportment, and may give rise to the embodied repertoire of such that sociologists call *habitus*' (original emphasis). Thus the history of the electrification of nations is the charting of the development of the infrastructural nature of habitus.

In the early 20th century, when standards for electrical supply were being established, the nations that were being electrified had reached a certain degree of bureaucratic and technological complexity that allowed for such process to be undertaken. There was a level of social and technical integration that created the conditions in which such large-scale multi-disciplinary, inter-sector projects could be undertaken (Hughes, 1983). In these circumstances, the norms and standards required by such a process were necessarily set at a certain level, one dictated by the extent of social and technical interconnection and interdependence that is the boundary of protocological maintenance. When such developments as the expansion of electricity generation and the concomitant growth of consumer appliances took place, the boundaries of integration were demarcated by the

extent of nation states, because this form of entity was the highest level of abstraction allowed by the political, legal and bureaucratic power structures of the time. Thus standardisation took place at the valency of the nation, as each country essentially established a national 'machine' of electricity supply and usage. There were, however, significant differences in the structure of such governmentalities in each nation since, in the UK, power essentially resided at the valency of the centralised nation state, whilst in the Netherlands much power devolved to the regional governments (Lesage, 2008).

The Dutch approach to the generation and distribution of electricity was established early in the 20th century as a range of different interests attempted to become the dominant players in the industry. Private companies, regional power producers and municipal electricity suppliers all vied for advantage in the market, just as the state sought to regulate it (Doyer, 1916; Verstegen, 1986). What was to become the Dutch national grid had developed during the First World War, as directors of the provincial electricity boards sought to create a broader network to supply energy to replace the domestic use of coal, which was in short supply at this time (Centraal Verslag, 1918; De Rijk, 2009). Early development had been geographically unbalanced, as power stations had been built in areas where high sales had been expected. Areas such as Amsterdam and Leiden were amply supplied whilst regions such as Drenthe and Zeeland were largely excluded from the electricity networks (Buiter, 1997). Thus to ensure that the countryside would be electrified as well, the provinces began to draw up local bye-laws and by the 1920s, it was clear that it would be the provincial governments who would control the electrical power grid that provided power to the nation (VDEN, 1926). So the municipalities were able to gain dominance by pioneering the shift from local and district facilities to region-wide provision through a process of laying the cable and building the infrastructure (Van der Vleuten, 2010). In the Netherlands, therefore, electrification happened under the aegis of regional government, but crucially for the establishment of the two-pin unpolarised plug-socket assembly as the standard at this time, in the process they relied upon the components and technical capabilities that were commercially available (Buiter, 1997).

In Britain, the National Grid was established by act of parliament in 1926 in the wake of the first World Power Conference (WPC) held in London two years earlier. In response to the conference's call for standardisation, the British government set up a committee under Lord Weir. This was tasked with creating a framework for the nationally integrated provision of electricity, and it was suggested that the various electricity supply companies should still own and operate the generating facilities, but a Central Electricity Board (CEB) should be established which would be responsible for connecting the most efficient stations into what was described at the time as a 'national gridiron' of high voltage transmission lines (Sinclair, 1985). Despite opposition to the parliamentary bill from the British Electrical and Allied Manufacturers' Association, the government were joined both by the Liberals and the socialists, with Clement Atlee and Herbert Morrison being instrumental in passing what even the Conservative Prime Minister at the time described as 'by far the most socialistic piece of legislation ever known' (see Cochrane, 1985: 15).

As members of the Joint Electricity Authorities (JEA), the bodies which preceded the unification of the new National Grid, Atlee's and Morrison's experience suggested that not only was the availability of electricity a force that could change how people lived, but that the generation of electricity, and the control of this, could be a motive force in the

creation of a fairer society. At the WPC the delegates had spoken glowingly of the transformative power of electricity (Bozell, 1924). A contemporary article in *The Times* (1924: 19) observed the general feeling was that the condition of Europe after the war was 'amazingly confused' as it seemed clear that there was not enough wealth left in the world to maintain pre-war standards of living. Thus electricity seemed to be a technological solution to this problem, and to the socialists it appeared to be literally the power that could change how people lived and worked. Although it was only later, after the Second World War, that a Labour government would be able to truly nationalise the system, what was important was that the material infrastructure was being put in place that then laid the groundwork for the following post-war expansion (Cochrane, 1985).

Plugging in

Overhead wires and underground cables are the national electrical mechanism at a certain scale. Yet we do not generally experience the national machine at this level. We may see them from a distance, but seldom do we encounter high-voltage power lines close-up. This is why we do not recognise them as being of our habitus; the scale is wrong. It is at the valency whereby the home connects to the grid that we subjectively experience the electrically powered nature of our culture. As Fred Schroeder (1986: 526) acutely observes, the 'commonplace act of plugging an electrical appliance into a wall outlet can be regarded as an act that connects directly into an industrial system', even if on a day-to-day level the users are no more likely to think of its attachment to a power plant than they are to think of forests when turning the pages of a newspaper. It is at the plug-socket assembly where we experience electrification. Yet despite the thoroughness of companies such as Edison's, the nature of the actual connection of the appliance to the wall was not initially specified. The point at which large-scale supply became use in the home thus took many different forms, and this was a situation that was functionally and commercially untenable (Mellanby, 1957; Mullins, 2006).

On the level of generation and mass supply it was the introduction of the rotary converter that allowed for the provision of electricity as a standardised product. Invented in 1888 by a former Edison engineer Charles Bradley, this was a device that could turn one type of current into another and transform a range of voltages, frequencies and phases into one form of output (Blalock, 2013). It regulated the flow, meaning that essentially the whole of the supply side of the electrification was operating on one protocol, making it suitable for utility provision. For mass use, however, what was needed was the standardisation of the connection between production and consumption.

With electricity, voltage is the pressure supplied and amperage, amps, is the rate of flow. The mass-provision of electricity, particularly in an AC system is the control of flow: what is put in, where it can go and how fast it can go there. Conduction cannot take place without connection; for current to flow, all the elements of the circuit must be connected. To do this, the connections need to be compatible; they need to be operating on the same protocol. Thus when nations were being electrified there was a need for the connectors that unified the appliances with the grid to be standardised if the system was to be maximised and a market established. The first patents for commercially viable electrical plugs and sockets were registered in 1883–1884. The two-pin form, of which

Figure 3. Pre-standardisation UK plugs and sockets. Notice the bayonet fitting light-socket adaptor (second from left). Such fittings were commonplace before the introduction of standard wall-mounted fittings. © Photograph: Damon Taylor.

the Dutch type is a version, then appeared in 1885 and was listed in a catalogue produced by the GEC corporation in 1889 (Mellanby, 1957: 165).

To begin with, the number of sockets that allowed electricity to enter the house was limited by technical capacity. In the UK and the Netherlands, even up until the early 1930s, the wiring supplied as standard to the vast majority of houses only supported a maximum of six ceiling fittings and one wall socket (Van der Vleuten, 2010: 91; Women's Institute, 1992: 69). Consequently domestic consumers would use a range of adaptors that fitted into light sockets and split wall connections to allow them to use more than one appliance at a time (see Figure 3). Thus the mobile consumer appliances that were available were inconvenient and often dangerous to use. So, although electric irons and curling tongs quickly caught on, it was some time after the initial phase of electrification that changes in planning law and the increased collaboration between manufacturers served to create the conditions in which electrical consumer goods could become a mass market in either nation (De Rijk, 2009; Hughes, 1983). That is to say, for domestic mobile appliances to become a viable proposition, both those installing the sockets in the houses and those fitting the plugs to the devices needed to be working to the same standard.

Standard connections

When a British Standard 1363 plug is pushed into its socket fitting, it does so with a satisfying 'snap'. This is because the top earth pin on the plug is longer than the lower live and neutral pins, and as it slides into its housing it engages a shutter within the socket, which slots down with an action that allows the other pins to slide home into their

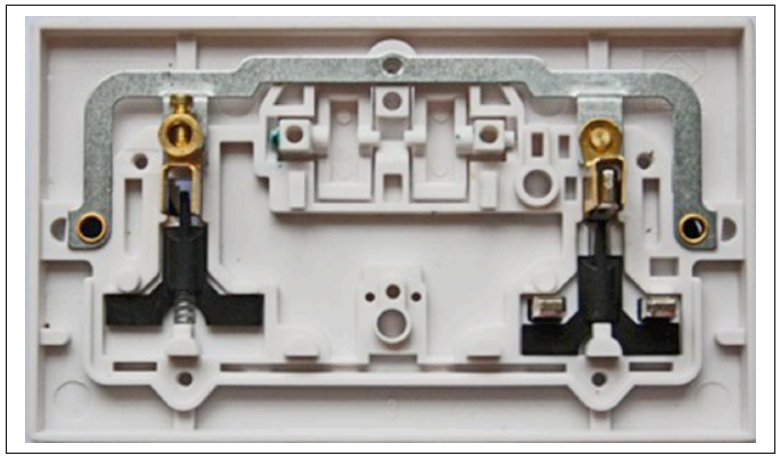

Figure 4. The BS1363 socket seen from the inside. The socket on the left has the shutter held in the closed position by a spring. The right hand socket has a plug inserted, pushing the shutter down. © Photograph: Damon Taylor.

connectors. When the plug is withdrawn, the shutter clicks back up and covers the holes in the socket (see Figure 4). The British plug is like this because it was designed as one unit made to a standard set by a politically orientated bureaucratic process that did not take place in the Netherlands: the centralised state administered nationalisation of the electricity supply.

In both Britain and the Netherlands, the initial phase of electrification was dominated by commercially driven differentiation, a process which each state attempted to regulate but did not initiate (Buiter, 1997; Cochrane, 1985; Hannah, 1977; Van der Vleuten, 2010; VDEN, 1926). In the Netherlands, as in the rest of continental Europe, the round two-pin plug-socket assembly developed as the dominant design as this was, with some variations, the connection used by the companies that had derived their technology from Edison's (Jonnes, 2004). Such an unpolarised, symmetrical system has a disadvantage, however, in that it has no earth contact, thus making it more dangerous to use. An earth or 'ground' connection is necessary as it protects the user if the insulation becomes compromised, allowing the current to flow away harmlessly. This problem was solved by Albert Büttner of the German company Bayerische Elektrozubehör GmbH. Working from an idea by Werner von Siemens, Büttner developed a socket with earth clips at the top and bottom which make contact when a plug with corresponding contacts is pushed into its recessed housing (Schwedt, 2013). The 'Schuko' ('Schutzkontakt', or 'safety-connection') socket then quickly became the standard across the electrifying regions of continental Europe dominated by those companies that were working with the two-pin standard plug derived from Edison's (Hughes, 1983; Jonnes, 2004). This was not least because the 'Schuko' will work not only with the earthed plugs made specifically for it, but it will also take any appropriately sized ungrounded, round two-pinned plug. This versatility then meant that this coupling of plug and socket could become the commercial de facto standard across Europe.

However, although the popularity of the 'Schuko' as a socket type had delivered an effective commercial norm across the region, there was still a great deal of variation in terms of the plugs that would fit it, with each country having a different type (International Electricity Commission [IEC], 2014). By the early 1930s, the Internationale Fragens-Kommission, a group of electricity suppliers from 12 countries met in the Netherlands to attempt to bring some form of standardisation to electrical fittings. In co-operation with the IEC, Technical Committee 23 was formed to address this need. Given the complexity of the task of bringing together disparate national systems with no real power or mandate, progress was slow. Meetings in Torquay in the UK in June 1938, and Paris in June 1939 did not even result in an agreed agenda, and the war inevitably halted work completely. Although 1957 saw the release of the International Commission on the Rules for the Approval of Electrical Equipment (IECEE) *Publication 83, Standard for Plugs and Socket-Outlets for Domestic and Similar Purposes*, this was little more than a technical report that detailed what was actually in use. It was not until the second edition of this document in 1963 that what is now referred to as the 'Europlug' (the standard round two-pin) made an appearance as CEE 7/16 (IECEE, 1963[1957]). What then was noteworthy about this standard was that it specifies the plug only, as it is the already existent Schuko to which it marries (IEC, 2014). Thus this was not a national standard for the whole plug-socket assembly that was being established, rather it was a ratification of a commercial fact on the ground whereby good enough connections were being made from what was available, within national norms.

In the UK, after World War II, the newly elected Labour government set up a British Electricity Authority over 14 Area Boards and the grid as a whole passed into full public ownership in April 1948 (Cochrane, 1985). Prior to this, in 1947, 'British Standard 1363 Fused Plugs and Shuttered Socket Outlets' was introduced, based on principles laid out in the Ministry of Works publication, *Post War Building Study 11: Electrical Installations*, the report of the Electrical Installations Committee (EIC), published in 1944. Initially convened two years earlier, the EIC had been formed by the newly appointed Minister of Works and Planning, John Reith, as part of a series of reports on standards for reconstruction, with the remit 'of securing a comprehensive and co-ordinated review of building techniques for the guidance of those who would be responsible for the direction and organisation of building after the war' (see Coles, 2012). When Lord Reith, as he was at this time, took up this governmental position in 1941, Britain had been devastated by the Blitz and German bombing had destroyed a great deal of the housing stock. There was thus a need for a mass programme of house building, and the *Post War Building Studies* were to act as a large-scale analysis, plan and basis for regulation for this project. Reith came fresh from experience of building the BBC, essentially from scratch. This had been a huge technical and logistical exercise, one for which there had been no blueprint. Thus he clearly had an appreciation of the scale of planning, and the grasp of detail, necessary for such an undertaking to be achievable. He also brought with him a paternalist ethos fostered at the BBC, one which asserted that 'public-service motive' and a 'sense of moral obligation' necessitate that the agency of the state should be directed to utilitarian ends; that the benefits of modernity, in this case the fruits of peace, should devolve to all; and that power should do its best for the common man (Dyson and Humphreys,

1988). This then shaped the remit of the committee, which in turn set the parameters of the technical system that could result from this exercise.

In a series of 22 meetings, the committee debated the particulars of the new wiring arrangements and thrashed out proposals. Their area of responsibility covered 'the supply of electricity for all purposes from the point of entry of the current at the property boundary to the point of its delivery to an appliance', as well as having responsibility for all electrical household appliances and electrically operated telecommunications (MoW, 1944: 1). Recognising that the rapid expansion of electrical appliances in the home was a trend that was likely to continue, they suggested a need for a dramatic increase in the socket-outlets in post-war housing. To these ends, paragraph 76 of the study introduced the single pole fuse ring-final circuit. It was proposed that 'all socket outlets should be supplied from a "ring circuit" which, starting and ending at the fuse terminal at the consumer's supply control will pass through each room in turn' (p. 18). This was thus a departure from pre-war practice whereby the sockets in a dwelling would be wired in a radial pattern with each outlet running back to a central hub. The new configuration was primarily suggested for economic reasons, although the technical advantages soon became apparent. Since each socket in a ring circuit provides two independent conductors for live, neutral and earth, it thus provides two ways in which the electricity can flow. Because the load is split across the different routes, the amperage in each direction is half of the total, and this allows for the use of copper wire with half the current-carrying capacity, which is much cheaper. Yet when protected by high-rated overcurrent circuit breakers, ring circuits can also supply a large number of sockets. With the use of such high amperage circuit breakers, in this case typically 30A, it was therefore necessary to incorporate a fuse of lower amperage on the appliance side of the electrical system (which in the British system was set at a maximum of 13A). This feature was thus not primarily a safety measure for the user of the appliance, rather it was a necessity if the ring main was to be secured.

Post War Building Study 11: Electrical Installations made one proposal that was identifiably driven by a high value being ascribed to safety and the protection of the population. Despite shuttered sockets having been available since at least 1906, it was the 'anti-flash' shuttered socket first introduced by MK Electrics in 1926 that can be recognised as the forerunner of the flat three-pin British assembly (Mellanby, 1957). This innovation was claimed as an improvement on its unshuttered predecessors primarily because when the plug was inserted the initial resistance caused by the presence of the shutter, and the tightness of the connection tubes, ensured that it would always drive home with a 'snap' as the shutter opened; at the same time this action cut off the arc on withdrawal of the plug. The report thus proposed that all plug-socket assemblies connected to the ring-main should be of this form, expressly 'to ensure the safety of young children', to prevent them inserting their fingers into the connection tubes (MoW, 1944: 20).

As Foucault (1991: 76) notes, there is a tendency to assume that the world comes to us in the only inevitable form, one that is 'self-evident, universal and necessary'. Through what could be called the re-singularisation of the object through the charting of its history, so the 'connections, encounters, supports, blockages, plays of force' and 'strategies' that allowed it to come into being can be factored back in. Both the BS1363 and the

Schuko two-pin arrangement were put together from the technology that existed at the point at which they became the dominant design in each nation. Once such a standard has been arrived at, it is very difficult to change it and incorporate new features, even if they would improve its function (Brian, 1989). Such a component of culture, in this case a significant though often unnoticed feature of the homes we inhabit, remains as the physical manifestation of the material ideological pressures that brought it into being in the form that now endures. In this way, the possibilities of the banal nationalism of the act of plugging-in in a particular geographical region have been conditioned by the historical contingencies that have determined the conduct of conduction in that place.

Conclusion

When I failed to plug my BS 1363 into the Schuko socket on the wall, this happened because different modalities of governance, determined by historical circumstance, had mitigated for particular socio-technical conjunctions in each region where the apparatuses were produced. The UK plug is a device that is the direct product of paternalist, public service ethos. The need to rebuild after the war, and the desire of the mass of the population to have freely available electrical energy in their homes, established the conditions in which the state was forced to find a solution. The nationalisation of the electricity supply then created the conditions in which a state-mandated standard could be established. A bureaucratic structure, the government committee, through setting values (arguably reproducing those upon which its remit was established) dictated the criteria upon which technical decisions could be made. Technological capacity then specified what hardware could supply this defined need. Economic limitations mitigated towards the introduction of the domestic ring-main; this allowed for a number of sockets to be installed in the home; this needed fused plugs, so the plug housing had to be large enough to accommodate the fuse, and it needed to be possible to change the fuse, should it blow. The perceived need for a shuttering system then dictated that there should be a three-pin arrangement with a longer shaft at the top. Thus the BS 1363 plug I held in my hand was a socialist artefact produced in 1947 as part of what can literally be described as an act of social engineering, one intended to protect the young and provide safety for all.

The Dutch power socket I was left staring at is the physical expression of a practical accommodation achieved in 1926; the plug that is meant to connect with this takes the form it does because of a similar process, whereby a de facto standard was achieved through a commercial accommodation to what works. Thus the large, over-engineered, safety-conscious British plug would not connect with the material expediencies of the Dutch socket. Such lines of descent may not be consciously registered, but the physicality of the artefacts, the actualisation of what was and is possible within specific governmentalities of conduction took its effect.

In my hotel room in Amsterdam I experienced the shock of one who found himself unpreparedly outside his national habitus, that space where the learned practices and standards of everyday life are so self-evident and natural that they are not noticed. A defining feature of habitus is the fact that the infrastructure of daily life is not registered because of its very banality; that when we feel we belong somewhere this is in part because we have ceased to notice its physical qualities because they just ‘are’. Yet the

infrastructure of experience is to a large degree determined by real, physical infrastructures that allow us to live our lives in the manner that we do.

Such material networks of flow, the power sockets, plugs and other technical paraphernalia of daily life are governed by certain standards, the protocols and conducts of conduct that determine the limits of possibility. In this way, the valencies of national habitus, in all their banality, can be glimpsed and in this moment of recognition it is possible to apprehend for a moment how such small things shape how we live.

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Note

1. The rival attempts by Edison to promote DC current and Westinghouse to establish AC as the norm in the USA are undoubtedly the most famous standards 'battle', if not in the whole field of technological development, then certainly in terms of the introduction of electricity. It is not discussed here because of its extensive coverage. See, for example, Hughes (1983) and Jonnes (2004).

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