Architecture as an Apparatus of Governance: (British) Architecture from the Welfare State to the State of Neoliberal Workfare

Thesis

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Version: Redacted Version of Record

Link(s) to article on publisher’s website:
http://dx.doi.org/doi:10.21954/ou.ro.00012772

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Architecture as an Apparatus of Governance:
(British) architecture from the welfare state to the state of neoliberal workfare.

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Architectural Association, 2019
London, U.K.
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Acknowledgements

This thesis is dedicated to my late teacher, Gerassimos Vokos, whose lectures at the department of political sciences at the Aristotle University of Thessaloniki, initiated this research. I owe him great gratitude as a teacher. The thesis is also dedicated to my late father and engineer Athanasios Axiotis, who provided to me through his work with the means for my studies and for this research to be conducted.

This thesis would have not been possible without the valuable guidance, patience, and generous support of my director of studies, Marina Lathouri and of my supervisor, Thanos Zartaloudis to whose work, I found the pertinent intellectual framework for developing this research.

I would like to express my gratitude to Mark Cousins for his intellectual and professional support through all my studies at the AA and to Pier Vittorio Aureli and Mark Campbell for encouraging the project in its beginning. I would also like to thank my colleagues at the AA whose comments and suggestions contributed directly or indirectly to the development of the thesis. My dear friends and colleagues William Hutchins Orr and Ricardo Ruivo Pereira, whose Marxist critique and input have been valuable for the development of the thesis. A special thank you, is due to Douglas Spencer whose work on architecture and neoliberalism, but also his seminars on architecture and subjectivity have been important for the elaboration of some of the positions of the thesis and to Tom Weaver, whose case study recommendations enriched the research. I need to also thank Simos Yiannas, the director of the AA Ph.D. program and the AA Ph.D. Committee that through their bursary program made it possible for me to develop the thesis at the Architectural Association. Finally, but most importantly I owe a big thank you to my dear mum and sister, Aikaterini and Krystallia Axioti, as well as to Spyridon Kaprinis for all their unconditional support and caring.
Abstract

This thesis puts forward the hypothesis that architecture can act as an apparatus of governance and explores the theoretical, spatial, and material implications of this. It examines a specific milieu that of the British welfare state, which it positions as part of the liberal post-war reforms within capitalism and the modern institutional architecture produced by it. The thesis unravels the operations of this architectural apparatus by scrutinizing two specific moments in the mid-1960s when the welfare state was fully formed. Initially, it analyzes the Whitehall plan of 1965 for a new national and government centre, as indicative of the extensive bureaucratic mechanisms of the welfare state and a result of its calculative and scientific practices. The thesis demonstrates how the plan operates as an apparatus partaking in the formation of subjectivities and social citizenship of the people, while it manages to desubjectify its users within its design calculus. This way, it becomes evident that calculations are actions at a distance that manage to direct behaviours.

The thesis demonstrates the development of these scientific rationalities and rhetoric within the welfare state that created a technocratic ideology. It traces these in the architectural research produced at L.U.B.F.S. centre in Cambridge with the support of the state within the expanding higher education, showing how architecture attempted in this context to constitute itself as a science. The analysis draws a parallel between the calculative and scientific practices in government and architecture and exposes how calculations can connect these two fields, activating architecture as an apparatus. It demonstrates that these practices within the welfare state facilitated a transition towards a neoliberal technocracy in architecture. They transformed the architectural design into a rational economic action and public architecture was reclaimed as a commodity defined by exchange value and was resubmitted to the operations of the market. Moreover, they implemented in the architectural production technologies of government in the form of performance criteria, entrepreneurship, and risk management, which affected the ways public architecture implicates issues of value and addresses its subjects.

The thesis concludes with the dismantling of the welfare state from the late 1970s onwards. It presents the changes that took place, which denote a transfer of responsibility from the institutions of the state to the individual. These
changes realized the transition from the welfare state to a state of workfare, where social rights are remodeled into personal responsibilities and objects of private enterprises. The thesis presents the transformations in the production of the built environment and its re-commodification. It argues that it was through the proliferation of the examined operations, among others, that these changes became possible and the deployment of neoliberal forms of governance was facilitated. In conclusion, a critique of the role of architecture in forming apparatuses of government becomes possible.
INTRODUCTION & HYPOTHESIS
1.1 Methodology and Terminology: On histories of the present.

History as a time machine can mediate between past, present, and future. It can bring them together in configurations that allow for a contemporariness\(^1\) to form. Historical research, by providing a critical understanding of the present can equip us for the future. Since "the unknown future is in the history of the present, the future should be the precondition of the present calculation"\(^2\). In this sense, history can contribute to the formation of the future. This thesis addresses history as a means of critically engaging with the present\(^3\). Historical research and reflection on architecture cannot but go beyond the theories and practices of architecture and unpack their political dimensions\(^4\). So, history is here considered not as an already formed bulk of knowledge which we reproduce, but a field of research that provides through its dialectical relation to the present and the future, an understanding, and a critical view of the current constellations between political forces and architectural practices. In this case, the work of the historian becomes the work of a cartographer that gives form to a territory but also draws maps of future practice. "A cartography is a theoretically-based and politically-informed reading of the present which fulfills the function of providing both analytic and exegetical tools for critical thought and also creative theoretical alternatives"\(^5\). Feminist, post-structuralist, but also Marxist theory, for instance, all stress the need to depict social space and relations in late capitalism

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1 "Contemporariness is, then, a singular relationship with one’s own time, which adheres to it and, at the same time, keeps a distance from it. More precisely, it is that relationship with time that adheres to it, through a disjunction and an anachronism." Agamben, Giorgio. "What is the Contemporary?" in What is an Apparatus? and Other Essays, trans. David Kishik and Stefan Pedatella (Stanford: Stanford University Press, 2009), 39-54.


3 The historian as Walter Benjamin explains "grasps the constellation which his own era has formed with a definite earlier one. Thus, he establishes a conception of the present as the ‘time of the now’, which is shot through with chips of Messianic time.” Benjamin, Walter. "Theses on the Philosophy of History". (Addendum) A., Arendt, Hannah. ed. Illuminations, (New York: Schoken Books, 1968), 263.


as essential for any form of political action\(^6\). Of course, the act of mapping is a
difficult, if not impossible, one, as the cartographer is always a subject within
history. In our times, when critical distance has been lost, this has become an
even more difficult task to pursue. For instance, Rosi Braidotti proposes that a
nomadic subject, which is complex and situated, can become a cartographic tool
that allows for socially embedded and embodied mappings to be produced\(^7\). This
way, the subject informs and plays a constitutive part in the act of mapping.
Further, Fredric Jameson’s proposal\(^8\), for cognitive mapping, although it cannot
produce true maps, it can offer “scientific progress, or better still, a dialectical
advance, in the various historical moments of mapmaking”\(^9\). Thus, either we view
history through the singularity of its events or as a dialectical evolution,
cartography, and cognitive mapping, can be essential tools to situationally
represent social and political power relations. The thesis attempts such a
mapping of a historical process, through the examination of specific intellectual,
political and architectural formations. It does this by tracing some of the paths of
a specific historical transition and scrutinizing their articulations. The criticism
on cartography that although it has the ability to map and analyze relations of
power, by focusing on the specificities, it loses the conflictual power of dialectical
confrontation, is indeed a concern. However, it is the ability to position and
critically address these specificities, that remains important to this thesis, as it
becomes essential to be able to zoom in and out of history and inform strategies
and tactics of future action through these re-examinations.

For Michel Foucault, the study of historical processes took the form of a
genealogy. A genealogy for Foucault is considered not as the search for origins
or foundations, but as “a search for processes of descent and of emergence”\(^10\).

\(^6\) Also see: Toscano, Alberto and Kinkle, Jeff, Cartographies of the Absolute, (New York: Zero books, 2014).

\(^7\) Braidotti, Rosi, Nomadic Subjects.

\(^8\) Jameson follows on this following the proposition of Kevin Lynch. See Lynch, Kevin, The Image of

\(^9\) Jameson, Fredric, Postmodernism: Or, the Cultural Logic of Late Capitalism, (London: Verso books, 1992), 90.

Jameson follows the Marxian distinction between science and ideology. While, science provides a
way to know the world abstractly, ideology as redefined by Althusser, forms “the representation of
subject’s Imaginary relationship to his or her Real conditions of existence.”

As David Garland underlines, genealogy in the work of Foucault aims “to trace the struggles, displacements, and processes of repurposing out of which contemporary practices emerged, and to show the historical conditions of existence upon which present-day practices depend”\(^\text{11}\). In this sense, Foucault’s work is oriented towards the present and forms a history of the present. It employs historical research to address, understand, and critically approach contemporary issues\(^\text{12}\). He explains that this approach is “the opposite of historicism: not, then questioning universals by using history as a critical method but starting from the decision that universals do not exist, asking what kind of history we can do”\(^\text{13}\). This way, one avoids preexisting categorizations or teleological and deterministic explanations, allowing the historical research to map the emergence of new formations or the decent of existing ones. Histories of the present begin with a diagnosis of a current situation and follow with the problematization of its conditions. Problematization, in this research, is the calling into question of specific activities and the way they function within the practice of government\(^\text{14}\).

Employing this approach to critically address the present, the thesis seeks to problematize the present neoliberal condition and focuses on specific contemporary issues of government. This begins with the diagnosis of the dismantling of the welfare state in Britain and the thesis problematizes the transition that took place from the late 1960s onwards, from the welfare state to the state of workfare in which, we still are. Crucially, it should be noted that the thesis does not aim to survey the architecture of the welfare state but to question the role of institutional architecture and its practices in this transition. In this sense, it aims to understand and map the ways in which architecture can


\(^{12}\) For example, his lectures on The Birth of Biopolitics given between 1978-1979 trace and analyze the formation of neoliberalism as an art of government at the very moment that neoliberal governments come in power in Europe and the USA. Discipline and Punish, his book on the penal and disciplinary institutions was published in 1975 and comes as a commentary in the revolts in prisons that took place in France in the early 1970s. Similarly, his book on Madness and Civilization arrives in the 1960s at the moment, when there is a proliferation of psychoanalytical practices and analysis.


partake in the development and practice of government and become itself a means of government. To achieve this, the thesis works through the analytics of government rather than for instance using the well-established schemes of base (infrastructure) and superstructure of Marxist theory. It is through this open and dynamic mapping of power relations, rather than schematized presentations and classifications that a more detailed understanding regarding the operations of the subject can be retrieved. "Power relations are rooted deep in the social nexus, not reconstituted 'above' society as a supplementary structure whose radical effacement one could perhaps dream of." Moreover, power relations are not properties, but they depend on strategies, tactics, techniques, and dispositions. This information is constitutive for the practices of government. For this reason, the research begins by recording and scrutinizing singular events and historical formations through their specificities. Hence, it attempts to employ an approach to research, that examines specific historical formations (knowledge), which are manifested as visibilities (architectural projects, drawings, charts, etc.) and articulations (statements, reports, etc.), and relates them to technologies of government (strategies of power) and processes of subjectivation. The proposed manner entails the following schematic: one begins by posing questions and investigating a specific architectural object or statement and then proceeds by informing and reforming it through the collection of diverse evidence of research in order to understand anew the ways through which it relates to formations of knowledge and operations of power. Connections are drawn through this process, which aims to question and problematize certain aspects of the architectural projects and practices that are under investigation. The collected evidence come to justify and illustrate the relevance of specific concepts, which are employed in the theoretical analysis. However, this is not an empirically driven approach or an attempt to test alternative theories. The thesis follows a methodology that proposes a re-reading of the historical material through the application of specific theoretical concepts.

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15 Foucault, Michel, "The Subject and Power", Critical Inquiry, Vol.8, No.4 (Summer 1982), 791.

16 This is an issue that we will develop further in the following part.

17 Gilles Deleuze in his book on Foucault (London: Bloomsbury Academic, 2006) proposes that knowledge appears as historical formations (strata) in the forms of visibilities and articulations, and it is stratified, while power is not stratified, but diagrammatic and takes the form of strategies (he names power, the thought of the outside). Both knowledge (the stratified) and power (the non-stratified) affect the processes of subjectivation (the inside of thought named as foldings).
The application of these concepts, which are presented in the following pages, is considered operative in theorizing architecture as part of the analytics of government. Most importantly, this approach is regarded as essential in producing a contemporary critique that addresses the changes in architectural production during a certain period of time and, which is able to problematize the present conditions by throwing light on the role of architecture in government and by exposing the points of confluence and the common practices between these two fields.

The thesis further endeavors to illustrate the complexity of this process by focusing within a specific milieu, that of the modern institutional architecture produced for the British welfare state during the 1960s. Foucault defines a milieu as “a set of natural givens and a set of artificial givens...The milieu is a certain number of Combined, overall effects, bearing on all who live in it”38. As we will examine, by the 1960s, the British state was well established and contributed significantly to the architectural production of the time, through extensive building programs that it realized and supported. Indeed, modern architecture was introduced and largely applied in Britain through these initiatives. This way, one could say that a specific milieu had been constructed between institutional architecture, modernism, and the welfare state.

The thesis is organized around two specific moments within this milieu. The first one is the decision of the British government in 1963 to demolish the majority of the existing government buildings and construct a new government centre in Whitehall. The project was never fully realized, but it was indicative of the state initiatives for modernization at the time and was followed by the publication of the Fulton Committee report in 1968 by the British government which introduced significant changes in the public services and especially in the civil service. The second one is the emergence of a technocratic mentality within the operations of the British state and the formation of a state-academic-industrial complex, which aimed to modernize the British industry and workforce, by connecting the universities with the market. These two moments relate with each other in many ways, as we shall see, most notably through the reform and function of public institutions as well as the changes in employment and academic research. Using architectural case studies that correspond to these moments, the thesis

investigates how in these examples, different agents are assembled, and certain domains of architecture are constituted as governable and administrable. The specific objects that are examined are: the Whitehall plan for a national and government centre proposed by Leslie Martin with the contribution of Lionel March in 1965. The Whitehall has been through the history the governmental and administrative centre of the British state. The Whitehall plan of 1965 is a significant project in its history that presents both the operations of the British welfare state as well as the architecture conceived and produced for it. The second examination focuses on the establishment and operations of the Land Use and Building Form Studies Centre in Cambridge University and the development of a scientific approach in architecture, which is analogous to the technocratic and scientific rationalities that emerged within the British state at the time. This part of the investigation relies on archival research that documents and unravels the role that the state played in the changes in architectural production and profession as well as in the reformation of public institutions. The first moment analyzes the operations of architecture merely in terms of the economy of the subject, while the second moment, addresses these operations in regard to issues of social policy and political economy. This way, the thesis demonstrates the ability of architecture to mediate between the two.

These moments and case studies, of course, are not exhaustive of all the institutional functions and operations of the British welfare state, though they are indicative, and it is argued characteristic. They allow for a detailed and thorough examination that demonstrates important changes in the operations of government. The two domains under examination, those of the civil service and academia, have undergone since the 1960s profound changes leading to their fragmentation, outsourcing, and eventually, to their overall or partial privatization. Thus, their transformations have been fully unfolded and it is not difficult to diagnose them. In contrast, the provisions of social housing and health care, which are also essential components of the welfare state, although they have gone through serious transformations, they have not yet been completely dismantled, but exist in transitional forms within the provisions of the British state (who knows for how long). For this reason and because of their substantial histories, they require their own extensive and detailed investigation. Hence, the welfare state in this thesis needs to be "understood less as a concrete set of institutions and more as a way of viewing institutions, practices, and personnel,
of organizing them in relation to a specific ideal of government. Similarly, the ‘neo-liberal’ critique of the welfare state is not first a specific institution but is a problematization of certain ideals of government, of diagrams of citizenship, and the formulas of rule they generate\textsuperscript{19}. In this manner, the case studies and examples have been chosen to expose the particular way, in which these transformations took place through the application of certain rationalities and practices that were, or rather became, common in different domains of life.

Within this investigation, the research employs both discursive elements in the form of specific governmental reports as well as non-discursive elements in the form of architectural projects, that constitute visibilities (drawings, models, graphs, charts, formulas, etc.), as well as map forces of governmental practices\textsuperscript{20}. For Sven-Olov Wallenstein architectural critique in order to be productive, cannot refer exclusively to buildings, but should include various modes of architectural representation and extend to other forms of intellectual culture. As he points out: “This fluid status, which conjoins notions like presentation and representation, reality and its image, materiality, and immateriality, is one of the reasons why theory and practice cannot be opposed as, for instance, the intelligible and the sensible might be\textsuperscript{21}. The thesis works with documents and especially with archival material. The National Archives provided important information in the form of reports and ministerial governmental documents as they did the publications and records of the British parliament. The archives of Leslie Martin held at the R.I.B.A., have been essential for the development and analysis put forward by the thesis. On many occasions, it is the actual documents and the way that are presented and formatted that is telling of the actions and the intentions they reflect. This way, assemblages\textsuperscript{22} i.e. collections of

\textsuperscript{19} Dean, Mitchell, Governmentality, 43.

\textsuperscript{20} For Foucault, the relation between forms (discursive and non-discursive / visible and articulable) constitutes knowledge. While, every relation between forces is a power relation. Force is never singular but exists in relation to other forces. It is an action upon other actions. It is practiced before it is possessed. Most importantly, there is a primacy of power over knowledge. If power relations imply relations of knowledge, the latter also presuppose the former.


\textsuperscript{22} ‘Assemblages are already different from strata. They are produced in the strata but operate in zones where milieus become decoded: they begin by extracting a territory from the milieus. Every assemblage is basically territorial.’ Deleuze, Gilles and Guattari, Felix, A Thousand Plateaus, (London: Bloomsbury Academic, 2013), 585-586
heterogeneous elements are formed from the diverse material, from visibilities, statements, rationalities, technologies, and techniques, that are telling evidence of the practices and operations of government and of the role of architecture in them. This way, they are able to demonstrate the changes (of decoding and recoding) that took place from the 1960s onwards and map some of the paths of transition from the welfare state to the state of workfare, from institutions to spaces of modulation and from the social citizen to the dividual.\footnote{23}{The term dividual is used and analyzed by Gilles Deleuze in his text 'Postscript of the Societies of Control', October, Vol. 59, (Winter, 1992), 3-7.}

The welfare state is defined by Briggs as 'a state in which organized power is deliberately used in an effort to modify the play of market forces in at least three directions – first, by guaranteeing individuals and families a minimum income irrespective of the market value of their work or property; second, by narrowing the extent of insecurity by enabling individuals and families to meet certain social contingencies which lead otherwise to individual and family crises; and third, by ensuring that all citizens without distinction of status or class are offered the best standards available in relation to a certain agreed range of social services.'\footnote{24}{Briggs, Asa, 'The Welfare State in Historical Perspective'. European Journal of Sociology 2, 1961, 228.}

Workfare, on the other hand, is a term introduced by Joseph Schumpeter and later by James Charles Evers that was publicly used by Richard Nixon in 1969 to refer to the condition that recipients of benefits have to meet certain participation requirements and criteria in order to receive welfare benefits. It is 'the imposition of a range of compulsory programs and mandatory requirements for welfare recipients with a view to enforcing work while residualizing welfare.'\footnote{25}{Peck, Jamie, Workfare States, (New York: The Guildford Press, 2001), 10.}

So, while the welfare state intervenes in the market in order to guarantee certain standards of living to its citizens, the state of workfare is a condition in which these standards of living are to be earned within the operations of the market and are considered a personal responsibility. After the mid-1970s, the operations of the state start being characterized by an extensive managerialization and marketization of services and policies. Based on the logic of enterprise, social policies and the state follow the logic of flexibility and competitiveness of the market and start addressing the citizens as consumers of services that carry the responsibility of their choices and welfare. Thus, a change of responsibility
Methodology and Terminology

occurred, from the state to the individual. Through a series of political initiatives, the economic foundations of the welfare state are dismantled during that period. The thesis argues that this change had already started taking place within the operations of the welfare state since the 1960s. The implications of these operations and rationalities in the production and the nature of the institutional (till then mainly public) architecture in Britain, are important to consider. The parallel dismantling of the welfare state and the deregulation of capital and labour made obvious a more generalized crisis in the nature, production, and function of social provisions and public institutions, which was also evident in the practice of architecture.

These changes develop and are part of the deployment of a new way of government and of the transition from classical liberalism to neoliberalism. This new form of neoliberal government has been analyzed and presented in detail by Michel Foucault in his lectures at the Collège de France on The Birth of Biopolitics\(^{26}\). Foucault considers neoliberalism within the genealogy of government as a completely new form of governing individuals. David Harvey, on the other hand, who has presented A Brief History of Neoliberalism, understands neoliberalism, like others do (Fredric Jameson among them), as an alternation in the structure and operation of capitalism and its logic\(^{27}\). Although both accounts are extremely important and are taken into consideration, the thesis relies mostly on the description of the neoliberal forms of government, provided by Foucault and by Pierre Dardot and Christian Laval in their book The New Way of the World: On Neoliberal Society\(^{28}\), as they present in detail the changes in the government of individuals and of society, which are more relevant to this investigation since they depict the internal transformations of society rather than solely the alternations in the accumulation and function of capital. The development of capitalism, as well as the rise of postmodernity both in society and in architecture, are some of the issues that exist in the background of the transition from welfare state to the state of workfare that the thesis examines. However, it is not within its scope to address problems of periodization. The thesis


investigates a transition that became evident especially after the late 1970s when architecture entered a period that was characterized by a lack of interest in politics and criticism. However, it argues that these changes in the operations of government, but also in the practices of architecture were already in place much earlier and within the functions of the welfare state since the 1960s. This is not an attempt to undermine the importance of the welfare state, other than to clarify its operations within a capitalist market society and to explain its role in regard to our current situation.

This thesis draws from a diversity of sources and is informed by other disciplines such as history, sociology, philosophy, economic and political theory. It selectively extracts specific notions from these discourses and uses them as effective conceptual tools in order to analyze its case studies on two parallel levels; in relation to the political context of the time and their function regarding the production of particular forms of subjectivity and citizenship. For this reason, it would be useful to introduce a series of terms and notions that the thesis employs. For instance, as the thesis investigates government and the role that architecture has and can play in it, it would be useful to delineate some of the different forms that government has taken.

Governing could be said to originate from a form of what is known as pastoral power and a spiritual direction that can be found in the pre-Christian and Christian29 East, carrying “a purpose for those on whom it is exercised, and not a purpose for some kind of superior unit like the city, territory, state, or sovereign”30. Foucault provides in his lectures on Security, Territory, Population a genealogy of government and underlines that the problem of modern government makes a clear appearance in the sixteenth century in different forms as the government of a household, of a family, of the children, of oneself, of souls, of conduct, and of the state by the prince. It relates to the extent of government as well as to the

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29 This idea of pastorship allowed for a kind of relationship between God and the sovereign to be formed, God is the shepherd of men, as is also the king. Thus, the sovereign needs to order, but also govern the subjects of his sovereignty. The theological distinction between ordinatio (ordering) and executio (execution), between general and specific providence, defines the divine government in Christian theology. Agamben proposes that it is according to this mystery of government that modern governance also operates. He locates government, that he considers as the modern form of power, in the coordination between the two poles, those of general law and execution, of juridico-political and economico-managerial practices. See: Agamben, Giorgio, Kingdom and the Glory: For a Theological Genealogy of Economy and Government, (Stanford: Stanford University Press, 2011).
authority that one has in order to govern. Government exists within society, between sovereignty and family. In a first definition, Guillaume de La Perrière proposes that government is “the right disposition of things that one arranges so as to lead them to suitable ends”\(^{31}\). Thus, it is related to the administration and management of things and people rather than of a territory and its subjects, which is the object of sovereignty. Between the sixteenth and eighteenth centuries, the problem of government becomes the introduction of the economy into the political practice. Economic government or the art of exercising power in the form of economy is put forward by the physiocrats\(^{32}\). The economic paradigm of government is, in one sense, initially found in the ancient oikonomia of the house, which is the administration of the house through the allocation of resources, the distribution of tasks and the ordering of the family that involved a complex of productive, subordinate and personal relations\(^{33}\). Max Weber explains that this economic paradigm of government migrated from the government of the family and the house, as these gradually disintegrated through their exchanges with the outside (with the proliferation of money economy and private contracts), to the function of corporations, the market and eventually to the operations of the state\(^{34}\). The proliferation of techniques that apply this economic paradigm is eventually directed towards the administration of the population and its wealth. According to Foucault, it is the population with its regularities depicted by

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\(^{31}\) De La Perriere, Guillaume, Le miroir politique, oeuvre non moins utile que necessaire a tous monarches, roys, princes, seigneurs, magistrats et autres surintendants et gouverneurs de Republique (Lyon: Mace Bonhomme, 1555). In Foucault, Michel, Security, Territory, Population, 96. The discussion on government in the sixteenth century emerges through a literature that responds to the example of principality that is put forward in Machiavelli’s The Prince (1532).

\(^{32}\) By François Quesnay who was a French economist and physician and is known for publishing the Tableau économique.


\(^{34}\) For Max Weber, there are some common rational rules in ideal bureaucratic forms of public administration of the state and of private corporations. He writes: “The capitalist enterprise, created by the household which eventually retreats from it, thus, is related from the very beginning to the ‘bureau’ and the now obvious bureaucratization of private economy. But the factor of decisive importance in this development is not the spatial differentiation or separation of the household from the workshop and the store. What is crucial is the separation, for accounting and legal purposes.” See Weber, Max, “The disintegration of the household: The Rise of the capitalist spirit and of the modern capitalist enterprise.” In edited Roth, Guenther, and Wittich, Claus. Economy and Society, (Berkeley: University of California Press, 1978), 375-384.

For Karl Marx, on the other hand, while these two were different, they were interdependent. “The corporation is civil society’s attempt to become a state; but the bureaucracy is the state which has really made itself into civil society.” Marx, Karl, Critique of Hegel’s Philosophy of Right, (Cambridge: Cambridge University Press, 1977), 46.
statistics, that becomes the object of government. This signifies a transition from sovereignty to governmental management that becomes evident in the eighteenth century. Foucault describes these changes in the exercise of power as follows: “first, the state of justice, born in a feudal type of territoriality and broadly corresponding to a society of customary and written law, with a whole interplay of commitments and litigations; second, the administrative state that corresponds to a society of regulations and disciplines; and finally, a state of government that is no longer essentially defined by its territoriality, by the surface occupied, but by a mass: the mass of the population, with its volume, its density, and, for sure, the territory it covers, but which is, in a way, only one of its components. This state of government, which essentially bears on the population and calls upon and employs economic knowledge as an instrument, would correspond to a society controlled by apparatuses of security. These three forms of exercising power, sovereignty, discipline, and government do not replace one another but co-exist and overlap. Thus, a form of control of society through the interplay of security and liberty develops, which is constituted between the regulation of individuals and the exercise of their liberty. This is achieved through the setup of mechanisms of security. The apparatuses of security take the form of practices and institutions that ensure the optimal and proper functioning of the economic, vital and social processes that are found to exist within that population and would thus also include health, welfare and education systems. This way, they function through the administration of life and its operations, through the regulation of health, of the environment, of work and education. The governmental apparatuses of security and the development of knowledge are part of what Foucault names as governmentality as the ensemble formed by institutions, procedures, analyses and reflections, calculations, and tactics that allow the exercise of this very specific, albeit very complex power that has the population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technical instrument.

35 Foucault, Michel, Security, Territory, Population, 110.
36 Dean, Mitchell, Governmentality, 29.
37 This is the birth of biopolitics according to Foucault that is a form of biopower. The set of mechanisms through which the basic biological features of human species became the object of political strategy, of a general strategy of power. Foucault Michel, Security, Territory, Population, 2.
Thus, one could conclude that government is a form of pastoral power, that is exercised through the administration of things and people with the aim to direct their actions towards specific ends and it forms a power that crucially develops before and beyond the state. “To govern, in this sense, is to structure the possible field of action of other people”\textsuperscript{39}. Governmentality, Foucault’s term, is a more complex and specific form of power that uses an ensemble of institutions, procedures, apparatuses, and tactics to control the population through the regulation of their liberty and security. Finally, governance, in a broader sense, is a form of such governmentality, but one that has developed during the last fifty years. Eric Swyngedouw explains that governance “as an arrangement of ‘governing-beyond-the-state’ refers to the institutional or quasi-institutional organization of governing that takes the form of horizontal associational networks of private (market), civil society (usually NGO), and state actors. They provide for a much greater role in policy-making, negotiation, administration, and decision-making of private economic actors on the one hand and parts of civil society on the other in self-managing what until recently was provided or organized by the national or local state”\textsuperscript{40}.

The thesis employs all these terms in distinct ways and instances. Nonetheless, the term governance is mostly used, mainly because it is a broader term that avoids direct connotations to specific forms of political power or to a specific tradition of political thinking and most importantly because it unveils a paradox that is at the same time a symptom of the term itself; it brings out a managerial and possibly apolitical essence in reference to a political process. Governance, therefore, controversially refers to a practice of power that hides within something else or acts in the name of another. Interestingly, it is exactly through its managerial and administrative form that governance in the last fifty years has succeeded in becoming operative in the very transformation of individuals procuring the deployment of a form of power that is formative of subjects.

\textsuperscript{39} Foucault, Michel. “The Subject and Power”. Critical Inquiry, Vol.8, No.4 (Summer 1982), 790.

In order to map the operations of power and governance, the research employs a transversal approach that goes beyond interdisciplinarity, as it does not only consider how different disciplines relate to each other, but how socio-political events and ideologies, epistemological approaches, the emergence of new tools and technologies, come together to form certain architectural practices and discourses. This way, the research aims to cut through the different layers of knowledge and reveal preexisting and new correlations that have informed the architectural practice. The analysis of each of the case studies reveals specific operations of government. These operations are analyzed on the level of the economy of the subject so, in relation to their ability to participate in the production of subjectivities, in order to expose architecture’s capacity to direct its subjects. In parallel, the thesis analyses, how these projects can be seen as conducive to the development of the specific historical milieu and to be understood as products of its political economy. Through these operations two major transformations take place. The architectural practices, as many of the functions of the state, start to take the form of enterprises and of rational economic actions. This allows technologies and criteria of economic performance to be put in place and for the market to enter in previously public domains, to fragment and eventually privatize them. In parallel, the institutions of the welfare state start to transform into their formation and function. The gradual transition from public institutions to networks leads to distributing agency and eventually transferring responsibility from the state to individuals where the individual is not singular though it does no longer become a collectivity. In reality, these operations and rationalities can be considered as technologies of government that have the ability to direct people’s actions towards specific ends, while transforming the very subjects that act as such. Techniques and technologies of government are “the diverse and heterogeneous means, mechanisms, and instruments through which governing is accomplished. These concepts emphasize the practical features of government...are typically assembled from diverse elements, take part in techno-economic systems, constitute logistical and infrastructural powers, and subsume the moral and political shaping of conduct by performance criteria”41. Since these technologies of government that manage to transform and direct practices, policies, and behaviours, are implemented and proliferated through apparatuses, it becomes imperative to analyze these

41 Dean, Mitchell, Governmentality, 269.
apparatuses in their complexity, heterogeneity, and in their effects. The two technologies of government that will be examined are those of performance and of agency.

As architecture carries characteristics (spatial and material such as boundaries, distances, openings, ornaments, transparencies, etc. and immaterial such as regulations, policies, and finances), that can structure the possibilities of our actions, it can ultimately affect some of the conditions in which power can be exercised as well as give shape and form to these very exercises. Therefore, architecture could be considered as an apparatus functioning within the development of government (and eventual governance). The thesis starts its analysis from this hypothesis and proceeds by investigating the practices of architecture as an apparatus of governance within a specific milieu, that of the modern architecture produced for the British welfare state from the 1960s onwards, in order to elucidate its understanding and limitations. This way, it aims to expose the role of these governmental and architectural practices and operations in the transformation of welfare state as central rather than marginal.

The thesis consists of four components: Hypothesis sets the ground of the investigation by introducing the approach to history and historical evidence and the concept of the architecture as an apparatus.

Formation presents a short genealogy of governmental rationalities and describes the historical context within which the research takes place.

Operations develop the investigation of the operations of the architectural apparatus through the examination of case studies and specific practices. This takes place in two parts / moments that investigate distinct operations, through the examination of the role of a calculative logic in architecture and of the changes in the formation and practices of institutions of the state.

Transition examines the effects of these operations by reflecting on the historical transition that took place during that period and reconsiders the function of architecture in it.

The four parts of the thesis constitute a whole and all the elements (conceptual, historical, and architectural) that the thesis introduces, construct a field, within which the thesis unfolds and fabricates a milieu within the examined historical conditions. This way, the thesis positions architecture within a genealogy of
governmental practices and rationalities and produces a history of the present that aims to problematize the contemporary conditions of architectural production. The originality of the thesis relies exactly on the fact that brings together the analysis of architecture with that of government and exposes their points of confluence, while it aspires to contribute to the wider history of the architecture of the welfare state and the research of institutional architecture in Britain.
1.2 Hypothesis and Theoretical Context.

Architecture through its technologies, mechanisms, rationalities, and norms has the capacity to configure and orient our actions and behaviours as living beings. The thesis begins with the hypothesis that architecture can act as an apparatus of governance and explores the theoretical, as well as spatial and material implications of this. So, the main objective that the thesis poses, is to question and theorize this function of architecture. The thesis employs the theoretical concepts of the apparatus, governmentality and governance, and attempts to apply them in reading the historical material that it examines. In order to be able to engage and justify the employment of these terms, it is important to first clarify and define them in detail. The purpose is to investigate the role of architecture in the practice of government, not through the ability of architecture to represent, but through its capacity to orient actions and behaviours. The thesis aims to expose the means and practices involved in this process. The thesis takes up the notion of apparatus (dispositif) as presented mainly in the work of Michel Foucault, but it is also informed by other accounts and attempts to reflect on architecture as such, as an apparatus or a dispositif. The apparatus is part of the working hypothesis but becomes also a methodological tool in the sense that in an apparatus we need to look for transversalities, i.e. of how architecture negotiates different scales and economies. Hence, we will initially look into how the term apparatus has been understood and used in the context of different philosophical arguments, but also how it found applications in media theory, and most importantly in architectural theory. The purpose of this chapter is to present the theoretical background of this concept in order to illuminate the hypothesis, understand its presuppositions, as well as its implications, and follow a compatible methodological approach. This way, the hypothesis and the thesis itself are positioned within a wider theoretical discourse that addresses the political agency of architecture and its role in the practices of government.

Foucault first used the term dispositif in his lectures on the Abnormal on the 15th of January 1975 at the Collège de France when he discussed the historical process of the normalization of sexuality. Foucault stated: “the normalization of sexuality

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42 I will be using the two terms as interchangeable to each other. By apparatus, the thesis does refer to dispositif as defined by Foucault. Although, in other contexts, the two terms have often been distinguished with the apparatus addressing more the mechanical rather than relational aspects of a dispositif.
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— it refined a general technique of the exercise of power that can be transferred to many different institutions and apparatuses [appareils]. This technique constitutes the other side of the juridical and political structures of representation and is the condition of their functioning and effectiveness. This general technique of the government of men comprises a typical apparatus [dispositif], which is the disciplinary organization I spoke to you about last year. To what end is this apparatus [dispositif] directed? It is, I think, something that we can call “normalization”\textsuperscript{43}. In February of the same year, Foucault published Surveiller et Punir (Discipline and Punish: The Birth of the Prison)\textsuperscript{44}, where he also employs the term, and he continues to do so in L’Histoire de la sexualité (History of Sexuality) in 1976 and in many of his lectures since then. Giorgio Agamben\textsuperscript{45} proposes that the notion of the dispositif existed in the earlier work of Foucault as the term positivité (positivity), which he traces back to the idea of positive religion, the historical element of imposing rules, beliefs and rites in society, which can be found in the work of Hegel and is also discussed in the writings of Jean Hyppolite\textsuperscript{46}. Matteo Pasquinelli disagrees with this theological genealogy of the term and proposes that the notion of dispositif in Foucault is related and influenced by the work of Georges Canguilhem (both Hyppolite and Canguilhem were Foucault’s teachers) on social and organic normativity\textsuperscript{47} and the importance of a milieu in the definition of norms\textsuperscript{48}. Foucault applies the idea of the organism structured in relation to its context in the practices of power through the notion of the dispositif. Thus, the dispositif becomes an important element in the


\textsuperscript{44} This is the outcome of this lectures at Collège de France on Théories et institutions pénales (1972-1973) and La société punitive (1973-74).

\textsuperscript{45} Agamben, Giorgio, What is an apparatus? (Stanford: Sanford University Press, 2009), 3-4.

\textsuperscript{46} Hyppolite, Jean, Introduction à la Philosophie de l’Histoire de Hegel. (Paris: Seuil,1983) Hyppolite was Foucault’s teacher at École Normale Supérieure.


articulation of new forms of power relations by Foucault. Canguilhem himself, explains that norms are to be considered as forms of power exercised by the bourgeoisie initially through educational and medical institutions. Although it is not part of the scope of this thesis to examine this genealogy, the liaison proposed by Pasquonelli sustains the idea of the dispositif formed and existing in strategic relation to its milieu, and this is precisely what has taken up in this thesis.

Since 1975 and henceforth, Foucault uses extensively the term, but he only briefly defines it in a conversation. There he notes: "What I'm trying to pick out with this term is, firstly, a thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions - in short, the said as much as the unsaid. Such are the elements of the apparatus. The apparatus itself is the system of relations that can be established between these elements. Secondly, what I am trying to identify in this apparatus is precisely the nature of the connection that can exist between these heterogeneous elements [...] In short, between these elements, whether discursive or non-discursive, there is a sort of interplay of shifts of position and modifications of function which can also vary very widely." So, the apparatus (dispositif) is an assemblage of elements, that is characterized by the relations and interplays developed between them. And it is in these operations that the current investigations focus upon. Thirdly, he adds, "I understand by the term 'apparatus' a sort of shall we say formation which has as its major function at a given historical moment that of responding to an urgent need. The apparatus thus has a dominant strategic function." Thus, the apparatus is a historical formation and needs to be examined as such. Most importantly, it has a strategic nature, so it is able to direct and manipulate forces. The apparatus is thus always inscribed in a play of power.

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49 I need to observe here that the influence of Canguilhem from Lebenphilosophie could be potentially read in the idea of biopower and biopolitics introduced by Foucault.


51 Ibid.

52 Ibid.
It is essential to note here, that power is to be understood not as deriving from a specific point or a source but existing always as a relation and as an action\textsuperscript{53}. It is less of a property than a strategy\textsuperscript{54}. Thus, the exercise of power is a form of conduct, an action upon action. These actions need to be examined at the micro-level of relations and are directly linked to the problem of the government of people. It is the direction of actions through arrangements, dispositions, and distributions of heterogeneous elements, so through apparatuses that are often productive of relations of power. This is what Foucault, attempted to demonstrate in Discipline and Punish (Surveiller et Punir: La Naissance de la Prison, 1975) and in Les machines à guérir : aux origines de l'hôpital moderne (1976) regarding the formation of disciplinary power relations through the architectural apparatuses of panopticon prison and of the modern French hospitals respectively\textsuperscript{55}. Through these examples, Foucault demonstrates how a series of institutions during the eighteenth century, such as prisons, hospitals, schools, and workhouses by employing specific architectures, technological systems, and knowledge, became apparatuses of disciplinary power. Disciplinary power is exercised on bodies through processes of control, hierarchy, surveillance, and normalization that unfold within specifically designed institutional and material enclosures.

Security, on the other hand, is a form of power that makes its appearance in the late eighteenth century and related to the advent of liberalism\textsuperscript{56}, it takes the form

\textsuperscript{53} See: Foucault, Michel, "The Subject and Power", Critical Inquiry, Vol.8, No.4, (Summer 1982), 777-795. It is important to note here that for Foucault: "a relationship of confrontation reaches its term, its final moment, when stable mechanisms replace the free play of antagonistic reactions". 794.

\textsuperscript{54} Gilles Deleuze clarifies that for Foucault: power ‘is exercised rather than possessed, it is not a privileged acquired or preserved by the dominant class, but overall effect of its strategic positions. This new functionalism or functional analysis certainly does not deny the existence of class and class struggle, but illustrates it in a totally different way, with landscapes, characters and behaviours that are different from those to which traditional history, even of the Marxist variety, has made us accustomed. We are shown ‘an innumerable points of confrontation, focuses of instability, each of which has its own risks of conflict, of struggles, of an at least temporary inversion of power relations’’. See Deleuze, Gilles, Foucault, 22-23.


\textsuperscript{56} Liberalism can be defined as ‘a philosophy of limited government that respects the rights and liberties of citizens and employs the rule of law. As a practice of government, it uses the capacities of free subjects as among the means of achieving its purposes and goals. As an art of government, liberalism thus seeks to shape the capacities of the individuals and collectivities through disciplinary and biopolitical means.’ Mitchell, Dean, Governmentality, 267.
of government instead of laws and rules\textsuperscript{57}. It relies on calculation, analysis, rationalization, organization, and arrangement of multiplicities within a space of freedom towards specific ends. In this space, apparati of security, work with the givens; they organize, plan and regulate a milieu and through the administration of its elements, of events, of time, of risks, and desires, they effect and exercise a form of power over the population\textsuperscript{58}. Foucault, notes for instance, that one of the main features of the apparati of security is spaces of security, which he illustrates by discussing the problem of circulation, scarcity, and epidemics within towns in the eighteenth century\textsuperscript{59} and how the space of towns was organized to manage the population. Thus, apparati in the work of Foucault, although they can take specific architectural forms, as it is shown in his examination of institutions, they merely rely on the arrangement and organization of heterogeneous elements that allow for specific operations of government to take place. So, they should not be considered so much as objects rather than as networks.

Deleuze in his examination\textsuperscript{60} of Foucault’s dispositif stresses the heterogeneity. He describes the dispositif as a node or a skein, a multilinear whole formed by different lines. Apparati for Deleuze, are composed of lines of visibility, utterance, lines of force, lines of subjectivation, lines of cracking, breaking, and ruptures that all intertwine and mix together. These lines do not only compose the apparatus but also pass through it and make it move towards diverse directions. In that sense, a dispositif is an erratic and unpredictable formation. Thus, a way to approach an apparatus is by tracing these lines, by following long trajectories that demonstrate how histories of diverse elements meet within dispositifs and form them. This is one of the reasons that the thesis devotes space to the presentation of processes and trajectories, even if at times their direct relation to the examined project is not evident. This way, it is also able to follow

\textsuperscript{57} See: Foucault, Michel, Security, Territory, Population, Lectures One and Two, 1-55.

\textsuperscript{58} The problem of population allows for bioeconomic elements to enter the discussion of government as well as the aspect of desire that is crucial in the direction of actions. In contrast, Karl Marx proposes the form of class rather than that of population to discuss the relations of power within society.

\textsuperscript{59} Ibid.

\textsuperscript{60} Deleuze, Gilles, “What is a Dispositif?”, Two Regimes of Madness, Revised Edition: Texts and Interviews 1975-1995, (New York: Semiotext(e) / Foreign Agents, 2007), 343-353.
and describe processes that are immanent to the apparatus and specific to its formation. Further, Deleuze underlines two important consequences that derive from considering the dispositif. The first is the abolition of universals and the second is the change in orientation towards the new. Dispositifs turn away from the eternal to apprehend the new.

Giorgio Agamben in his analysis of the apparatus considers that apparatuses are the historical elements (used by Foucault instead of universals) that are able to realize the activity of governance. Agamben defines an apparatus as “anything that has in some way the capacity to capture, orient, determine, intercept, model, control, or secure the gestures, behaviours, opinions, or discourses of living beings”. The essential contribution of his analysis, though, is that he relates apparatuses to processes of subjectification and desubjectification. He distinguishes beings into three categories: living beings, apparatuses, and subjects and proposes (this is something in which he is in agreement with Foucault) that apparatuses put in place processes of subjectivation through which they govern. So, subjects are the results of the relation between apparatuses and living beings. Thus, every apparatus imposes a process of subjectification and this is exactly the reason that apparatuses cannot be used in a right or wrong way, but they determine their function and use. Furthermore, he notes that in late capitalism one can observe a proliferation and multiplication of apparatuses. However, these apparatuses do not anymore produce subjects. They desubjectify (which is part of the process of subjectification) but are no longer invested in composing subjects. This is for Agamben one of the main reasons for the disappearance of politics since politics presuppose the existence of subjects. This proliferation of apparatuses has put in motion an aimless machine of pure government that is completely elusive.

The ability of apparatuses to subjectify is also proposed by Louis Althusser in his text On Ideology (1970). Althusser expands the Marxist theory of the state and puts forward the idea of the ideological state apparatuses (I.S.A.), which are institutions educational, religious, legal, political, cultural, the family and the communications that function merely through ideology and supplement the

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**Notes:**

61 Agamben, Giorgio, What is an apparatus?, 14.

repressive state apparatuses (R.S.A.), such as the government, the administration, the army, the prisons, and the courts, which function merely through oppression. These I.S.A.s have the ability to interpellate individuals as subjects since ideology can constitute individuals as subjects. These individuals that have been initially alienated (desubjectified), they reconfigure through the apparatuses their imaginary relation to reality\(^63\). Of course, many of these I.S.A.s (schools, homes, churches, etc.) often are materialized in spatial and architectural formations. The purpose of these apparatuses among others is the reproduction of the relations of production.

For Althusser, the material (economic) base affects the superstructure that working through its apparatuses interpellates the subjects. However, I do not think that this one-way operation of the apparatuses is accurate. Apparatuses mediate between political economy (economic base) and economies of the subject in two ways, they partake in the production of subjects but are also constituted by them, affecting this way the forms of production. So, one could say that both subjectification\(^64\) and production pass through apparatuses. Apparatuses are productions, formations within the economic base, but they are also productive of their milieu and of the individuals that they engage (through the affects they have on the economies of the subject and the material economy)\(^65\). A dialectical relation between the two exists. Thus, architecture considered as an apparatus is both produced by the relations of power and is productive of them.

**Slavoj Zizek draws a parallel between the dispositif / I.S.A. and the Lacanian ‘big other’**. He notes: “There is a series of complex echoes between this notion of the dispositif, Althusser’s notions of the I.S.A. and of ideological interpellation, and Lacan’s notion of the ‘big Other.” Foucault, Althusser, and Lacan each insist on

\(^{63}\) This is the definition that Althusser provides for ideology.

\(^{64}\) I am here using the term subjectification rather than subjection that is employed by Althusser. For Foucault, processes of subjectification are also related to subjection. He calls this process *assujettissement*. For a more detailed analysis of this see: Le Blanc, Guillaume. ‘Être assujetti: Althusser, Foucault, Butler’ in Actuel Marx 2004/2 (n°36), 45-62. For Foucault, the relations of power are not fixed. There is power over and power of the subject.

\(^{65}\) Karl Marx in the introduction of Grundisse asserts that “Production thus not only creates an object for the subject, but also a subject for the object.” See: [https://www.marxists.org/archive/marx/works/1857/grundisse/ch01.htm](https://www.marxists.org/archive/marx/works/1857/grundisse/ch01.htm) (Accessed on the 9th of August 2019)
the crucial ambiguity of the term ‘subject’ (signifying both a free agent and subjection to power)—the subject qua free agent emerges through its subjection to the dispositif/ I.S.A./‘big Other’. Living beings or individuals become subjects as they are caught in such configurations. In parallel, the performative efficiency of dispositifs is suspended when the subject is subtracted from it. Another important point is that for Zizek in opposition to what is suggested by Althusser, dispositifs are not merely material, but also immaterial and they operate on a symbolic and virtual order.

Following a parallel path for understanding how architecture functions within such processes, Douglas Spencer in his lecture on Architecture and the Other Scene, discussing Manfredo Tafuri’s proposal to understand architecture in terms of material production, draws on Étienne Balibar’s understanding of materiality through the modes of subjection (imaginary) and of production (reality). Spencer suggests that “rather than a seam with the economic we might understand architecture as uniquely positioned between the base, or the infrastructural, and the ideological or superstructural. We might conceive of architecture as articulating and enabling the movement of the imaginary into the real and the real into the imaginary, architecture as a hinge point around which modes of production and modes of subjection are mediated.” Indeed, architecture understood either as positioned between base and superstructure or as a dispositif within a milieu carries this ability of mediation. Nonetheless, I believe that understanding architecture as a dispositif allows us to focus on the details of these formations and on the analytics that explain their complex operations rather than delimitating them within schematic categories.


67 Ibid. 418.

68 This is a proposal that is put forward in Tafuri, Manfredo, ‘L’ Architecture dans le Boudoir: The Language of Criticism and the Criticism of Language’, Oppositions 3, (1974).


In 1977, a conference took place at I.U.A.V. (Instituto Universitario di Architettura di Venezia) under the title of Il Dispositivo Foucault, which demonstrates an early interest in and appreciation of Foucauldian methods by architects, architectural historians, and theorists. A series of texts that emerged from that conference were published under the same title with contributions by Manfredo Tafuri, Franco Rella, Massimo Cacciari, and Georges Teyssot on different aspects of Foucault’s work. The essays reflect on the relevance of a Foucauldian approach to the analysis of relations of power within architectural problems, even if his work has often been criticized for missing the technical and material aspects that would further inform this analysis. Most importantly, the texts put forward a critique of the fact that Foucault does not propose a theory but an analysis of power that is not militant. They consider that the analytics of power silence class conflicts as the discourse moves the attention to devices and mechanisms rather than the politics of conflict. This criticism becomes at some points quite strong. Rella in his introduction of the book writes: “The removal of the complex of conflicts and contradictions that constitute the political and other parts of having recourse to the rationalization dialectic leads Foucault to the choice of the anarchist dispersion of the political (immediate reversal of his idealistic-dialectical conception), which prevents the constitution of transformational-revolutionary practices. And so, Foucault, but more so than him Deleuze, Guattari, Lyotard ‘invent new languages’ but with “empty ceremonies‘ proclaim their own impotence free.” Indeed, Foucault does not address the problem of power relations through the dialectics of historical determinism. This for some might compromise the revolutionary perspective of his work. Neither does he point to a specific source of power or a position for politics. However, I would like to propose and this is also the main reason why his work is being used as the methodological framework of the thesis, in that it is only through the analytics of power relations and of government that we can intervene strategically and

71 The book consists of four texts by Georges Teyssot on “Heterotopia and history of spaces”, by Manfredo Tafuri on the ‘Reading of text and the discursive practice’, by Franco Rella on “A political economy of the body”, and by Massimo Cacciari on “The problem of the political in Deleuze and Foucault (on the thought of “autonomy” and ‘game’)”.


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address these conflicts in their specificities at a time when the so-called 'sources of power' are depoliticized and seemingly, perhaps, vaporized. Working within and through them. It is especially, the examination of the dispositifs of government as presented in the work of Foucault that allows us to trace the practices of power in order to possibly redirect them. Thus, understanding architecture as a dispositif can help us to open up our investigations to “a multiplicity of knowledge, techniques and strategies” and to look to “the process of the production of capital from below.”

Paul Hirst’s book *Space and Power* (2005) is one of the first to consider Foucault’s ideas in analyzing architecture and the built environment within the frame of space and power relations. It indicates the importance of both the role of discourses in architecture as well as of power-knowledge in examining institutional structures and spatial relations. However, the texts do not take into consideration the late analysis of Foucault regarding governing through space. Sven-Olov Wallenstein, in *Bio-politics and the Emergence of Modern Architecture* (2008) a few years later, provides us with this fundamental analysis on how modern architecture has been a tool of ordering and disciplining society, through the examination of the changes in the architectural treatises of modernity, the emergence of the engineering discourse and the administering operations of the institutional architecture of prisons and hospitals in the late eighteenth century. This takes place not through an evident break but through a process of emergence in which architecture is transformed and operates within “a larger historical political assemblage”, acquiring “a new political quality”. Hence, architecture according to Wallenstein more than a symbolic entity becomes “a node in a network of knowledges and practices through which individuals were formed and a modern social space emerged”. It is thus considered by the author as “the instrument for the production of such a life and such subjectivity”, “a means of production and ordering” and “an essential part of the biopolitical

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Following a similar task, the thesis seeks to trace the emergence of a new kind of architectural practice in the late 1960s.

It is essential to note that Foucault in his analysis of the prisons and hospitals of the late eighteenth century uses the characterization of machines to discuss the ability of these institutions to order space and conduct behaviours. "Machines of creating and sustaining power" and "machines of healing" (machines à guérir), he writes. A dispositif should be thought in regard to its ability to employ and be composed of such machines. It can be thought of as an assemblage within a milieu that has the ability to form and be formed by concrete and abstract machines. These machines constitute but also exceed the dispositif. Concrete machines can take the form of tools, technologies, and architectures while abstract machines refer to diagrams of relations of forces that cross through multiple fields and overcome any physical form or materiality. Deleuze explains: "What is that Foucault calls a machine, be it abstract or concrete (he speaks of the 'machine-prison', but equally of the machine-school, of the machine-hospital and so on)?" The concrete machines are the two-form assemblages or mechanisms, whereas the abstract machine is the informal diagram. In other words, machines are social before being technical. Or rather, there is a human technology that exists before a material technology. No doubt the latter develops its effects within the whole social field; but in order for it to even be possible, the tools or material machines have to be chosen first of all by a diagram and taken up by assemblages. The suggestion that social power diagrams exist before their articulation as material assemblages, is also found in Lewis Mumford’s Technics and Civilization (1934) and merely in The Myth of the Machine (1967). Mumford proposed a distinction between technical objects and the complex of society (a megamachine), which

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78 Abstract machines are disposed as formless forms, dispersed in locations, modes of production and social strata. They can take the form of abstract knowledge, cognitive and affective labour and general intellect. See: Raunig, Gerald, A Thousand Machines, (Cambridge: Semiotext(e), M.I.T. Press, 2010), 91-120.

79 Deleuze, Gilles, Foucault, 34.

conditions them\textsuperscript{81}. One could say that dispositifs, apparatuses exist between the two and are formed by the two. They consist of machines and participate in forming abstract machines within society. Deleuze, familiar with Mumford’s writings, describes machines as compositions of parts (within society) that define a system of interruptions and breaks, which nonetheless conditions continual material flows. This continual flow realizes communication between the different parts. This way, a machine is a carrier of communication that connects to other machines\textsuperscript{82}.

Thus, to analyze architecture as an apparatus, as a dispositif, we need to take into consideration the abstract machines that these apparatuses form and the machines (concrete and abstract ones) from which they are constituted. Architecture has for over a century been envisaged and conceptualized as a machine. The concept of architecture as machine can be traced back to Encyclopédie d’Architecture by Adolphe Lance in 1853\textsuperscript{83}. Since then, the relation between architecture and machine has been presented in various ways, merely representationally and metaphorically. Nonetheless, a number of architectural historians and theorists (Reyner Banham, Antoine Picon, and more recently Reinhold Martin and Keller Easterling) have focused on the performative aspects of architecture as a machine. Moritz Gleich and Laurent Stalder in their introduction to the papers of the symposium Architecture/ Machine programs, processes, and performances put forward an investigation of architecture as machine that engages with temporal and physical processes, with issues of allocation and arrangement\textsuperscript{84}. They attempt to understand architecture in an

\textsuperscript{81} It is interesting here to consider the megamachine that Mumford proposes in relation to Marx’s description of machine in ‘The Fragment on Machines’, The Grundrisse. For Marx machine (the automatic system of machinery) is the culmination of means of labour, which consists of numerous mechanical and intellectual organs and in which workers are themselves cast as linkages.


\textsuperscript{84} Gleich, Moritz and Stalder, Laurent, eds., Architecture/ Machine programs, processes and performances, (Zurich: gta Verlag, ETH, 2017), 4-12.
operative and performative way, engaging information and aligning with epistemic changes, becoming a form of action that expands beyond its materiality.

For Mary Louise Lobsinger, these kinds of investigations constitute a methodological turn in architectural history from the hermeneutics of culture and representation towards media. This is “a mode of research that attempts to track the concrete procedural networks and the materiality of cultural techniques.” It relies on Friedrich Kittler’s and Marshall McLuhan’s idea that media determine a situation and analyzes architecture as a medium and an infrastructure. This is an approach that Keller Easterling has been developing the last few years initially presenting architecture as an infrastructural space and as a medium. Easterling looks into space as a network, as an organization of social, political, and technical elements and investigates the possibilities of the disposition and of the relationships between these objects. Moreover, she proposes that architects need to focus on ‘the water and its flow’ rather on the objects that exist within it, and on mediums as active forms and how they operate rather than on architectural objects themselves. She considers that this approach stretches Foucault’s notion of a dispositif. Indeed, understanding architecture through the tracking of networks and of materialities of media is something that is essential in analyzing architecture as a dispositif. Actually, the term dispositif (apparatus) does appear in media theory and more specifically, in French film theory, during the 1970s, merely in the work of Jean-Louis Baudry and Jean Louis Comolli. However, a dispositif, in my opinion, is something more than a mere medium. Mediums can be part of dispositifs or even become themselves

88 The term is employed to discuss the ideological operations of cinema, through its mechanisms of representation as well as the positioning of the spectator. It is analyzed in regard to its psychoanalytic and semiotic aspects. For more information on this, see: Baudry, Jean-Louis, “Le Dispositif”, Communications No. 23, 1975, 56-72. Also, Baudry, Jean-Louis, “Ideological Effects of the Basic Cinematographic Apparatus”, in Film Quarterly, Vol. 28, No. 2, (Winter, 1974-1975), 39-47. And: Comolli, Jean Louis, “Machines of the Visible”, The Cinematic Apparatus, (London: Palgrave Macmillan, 1980).
dispositifs, but they need to operate in a specific way in order to do so. The emphasis on the dispositif lies in its ability to be produced by and at the same time to be productive of a multiplicity of elements / lines. Most importantly, a dispositif is constituent in the practice of government within a space of security. It is specifically located within it and this way it has the ability to conduct and direct actions towards specific ends. It is not only a mere instrument or an action within a network. It is a directed and strategic act within power relations, a vector rather than a simple interaction, formed by political and material forces.

Reinhold Martin in his books on Organizational Complex (2003), but more explicitly in Utopia’s Ghost (2010) and the Urban Apparatus (2016) does address architecture as working within a network of organization and communication of objects, processes, and imaginaries that intersect aesthetic qualities and political economies and exist in a feedback loop, as input and output of power formations. He actually, employs, the term, apparatus in the last two publications, to describe a set of sociotechnical and discursive relations that function as political, economic, social, and spatial strategies. Most importantly though, for Martin "an apparatus is an assemblage of mediators, of difference engines, that pry things apart such that order reigns. An apparatus is a machine and a discursive system that says ‘yes’ and ‘no’ at once. It is a double bind". Martin explores the apparatus through the investigation of mediators, of material complexes that can take diverse forms, from statistical reports to iconic buildings. This is a useful approach in investigating apparatuses; however, it does not always reveal the strategic position of these mediators within relations of power. Nadir Lahiji is the one, who explicitly proposes the term architectural dispositif to discuss the ability of architecture to desubjectivize the subject and operate as one of the many mechanisms (dispositifs) of power in late capitalism. In that sense, his claim agrees with the thesis hypothesis that architecture can and does operate as an apparatus (a dispositif) of governance. However, Lahiji seems to merely focus on the aesthetic, affective, and architectural aspects of these dispositifs rather than their technological, economic, and material complexities within the space of political economy, which the thesis aims to unravel through the examinations of

89 Martin, Reinhold. "The Urban Apparatus", The Urban Apparatus, Mediapolitics and the City, (Minneapolis: University of Minnesota Press, 2016).

specific operations. Summarizing, I would like to underline that to think of architecture as an apparatus means to think of architecture as a whole composed not only by materialities but by a complex of technologies, norms, discourses, and protocols. Architecture is thus approached and studied as a specific historical formation (against universals), therefore examined within a specific historical milieu; as having the ability to mediate between political economy and the possible economies of the subject, and finally, as being produced by and through relations of power while being productive of them.

Moving forward, the thesis begins with the proposition which is at the same time its working hypothesis that in order to be able to unravel the actual role of architecture within the practice of government and the reality of power relations, we need to think of architecture as an apparatus, as a dispositif of governance. It is the operations of architecture as an apparatus of governance that the thesis would attempt to trace in order to both prove and illustrate its hypothesis, but at the same time to analyze the role of (British) architecture in the transition from the welfare state to the state of workfare and in the deployment of the contemporary modes of governance. In order to achieve this, the thesis will focus and analyze the operations of the architectural apparatuses through the examination of specific architectural formations. The case studies that the thesis visits are scrutinized in relation to the operations of the architectural apparatus that the thesis puts forward as critical to architecture’s ability to conduct. Two important operations are those of calculations and of institutional delimitation, however, they are not the only ones that can and do take place through the formation of a dispositif. This way, it is possible to demonstrate the changes that took place during the examined period; the transition of Britain from a classic welfare state to the state of workfare and the parallel transformation of the individuals from social subjects to dividuals that are no longer located within institutions and spaces of enclosure, rather they exist in open circuits of modulations.

Oriented towards the analytics of government the thesis puts forward questions of ‘how’ instead of ‘why’, in order to address problems of techniques, practices,

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91 This is a definition that Thanos Zartaloudis proposed in his lectures on Commanding Architecture at the Architectural Association in November 2014.
Hypothesis and Theoretical Context

and rationalities through which governance operates. It aims to explore how architecture operates as an apparatus of governance? How are we governed by architecture and how do we govern through it? Which are the variables involved in such a process? What are the architectural properties, design mechanisms, technologies, rationalities, and norms that frame and guide our operations, conceptions, and sensibilities? How do they operate, and which are their affects? How do they intercept with other practices and allow specific aspects of governance to be exercised? However, these are questions that cannot be answered in a general way,

In order to investigate these questions, the thesis addresses them within a specific milieu, that of the British welfare state and the modern institutional architecture that was produced for and by it. In fact, the thesis describes the formation of the modern British welfare state through its legislative and building programs. It positions the welfare state as part of the liberal reforms within capitalism in relation to the post-war consensus. The thesis attempts to unravel the operations of architecture as an apparatus of governance by scrutinizing specific moments (case studies) and functions of the architecture produced by and within the British welfare state. It does that by focusing on certain operations during the mid-1960s when the welfare state was fully developed and formed. The sociopolitical changes during that period affect the politics of architectural production (moving the focus from the institutions to the logic of the market), but most importantly the way architecture addresses the subject till today. The thesis presents how this transition was realized through specific operations. This is demonstrated either by exposing the internal contradictions and diverse aspects that the same project incorporates, or by comparing projects of the same period with a different approach.

More specifically, the thesis examines these operations in two moments. Initially, it analyzes the Whitehall plan of 1965 proposed for a new national and government centre (Operation A). The thesis considers the plan as an attempt to both foster the welfare provisions for the citizens, as well as a calculation mechanism characteristic of the bureaucratic policies and techniques associated with the welfare state. The plan is positioned within a larger assemblage of calculations and is connected to the calculative and scientific practices of the welfare state. The thesis demonstrates how the plan operates as an apparatus
partaking in the formation of subjectivities and social citizenship of the people. At the same time, it argues that the plan manages to desubjectify its users within its design calculus and strip them from any personal characteristics. This way, they participate in the formation of machines of calculations that transverse the architectural apparatus. People are affected by these machines of calculations and by the assemblages of elements that they form. Thus, it becomes evident that calculations are actions at a distance that manage to direct practices and behaviours.

In the second part (Operation B), the thesis demonstrates the development of scientific rationalities and rhetoric within the welfare state that created a technocratic ideology. It explores how these practices and rationalities affected the operations of the welfare state and eventually its transformation and dismantling. The thesis argues that it is a rising neoliberal technocracy that is formed through these practices, which are promoted by both the Conservative and the Labour Party. The thesis traces these practices and rhetoric in the architectural research produced at the time with the support of the state at the expanding higher education and shows how architecture tries in this context to constitute itself as a science. Thus, the analysis draws a parallel between the calculative and scientific practices in government and architecture and exposes how calculations can connect these two fields. In other words, architecture is activated as an apparatus of governance through calculations that establish technologies of government. This way, the Whitehall plan can also be positioned within the wider calculative practices of the architecture of science.

The thesis demonstrates that these practices within the welfare state facilitated a transition towards a neoliberal technocracy in architecture. They transformed the architectural design into a rational economic action and public architecture was reasserted as a commodity defined by exchange value in contrast to the post-war welfare state efforts. Moreover, they implemented in the architectural production technologies of government in the form of performance criteria, entrepreneurship, and risk management. These technologies exercised through the establishment of calculative and scientific rationalities and practices, not only affected the production of architecture, but also the way public architecture implicates issues of value and addresses its subjects. This way, the social architecture of the welfare state is transformed and depoliticized as it becomes
dictated by technical, managerial, and calculative problems, rather than political ones. Thus, the deployment of a form of governance is possible, which carries no political characteristics but operates through the practical administration of life by calculations.

The thesis concludes by examining the dismantling of the welfare state from the late 1970s onwards. It traces the changes that took place in the following years, which denote a transfer of responsibility from the institutions of the state to the individual. These changes constitute a transition from the welfare state to a state of workfare, where social rights are remodeled into personal responsibilities and objects of private enterprises. The thesis presents the transformations that took place both in social policies and welfare provisions, but most importantly in the production of the built environment and its commodification. It argues that it was through the proliferation of the previously examined operations, among others, within the welfare state, that these changes in policies and architecture became possible. They managed to transform the ways people and the state functioned and established a form of governance from within. The thesis considers these changes as part of the deployment of neoliberal forms of governance. In light of the above, the investigation concludes by reconsidering the role of architecture as an apparatus of governance, and the ways in which it facilitated the transition. This way, the thesis manages to answer its initial questions, to theorize architecture as an apparatus of governance, and illustrate its operations. By following this theoretical approach, the thesis is able to trace a transition and most importantly to position and analyze these changes in architectural production as part of the analytics of government. It becomes evident that the reading of historical material through the employment of the concepts of apparatus and governmentality can produce a more detailed reflection regarding the political agency of architecture and the ways it participates in the practices of government.
FORMATION
2.1 On the calculative rationalities of government.

The first part of the analysis will investigate the historical formation and the context of the practices and rationalities, which the thesis examines. In order to address the questions of the analytics of government that the thesis sets, we first need to extend a brief genealogy of governmental practices and rationalities, some of the most essential of which are calculative. Calculations transform information inputs through logical or mathematical reasoning. They process information to predict, plan, and control a specific outcome, and hence they are used in the recording and allocation of resources. Éric Brian, in his book, La Mesure de l’État: Administrateurs et géomètres au XVIIIe siècle\(^\text{93}\), demonstrates that calculations and mathematics carry both a scientific and a socio-political history that cannot be separated. Geometry, analysis, practical calculations, political arithmetic, political sciences, and administration bear the very same beginning. Brian rejects the distinction between an internal and external approach to the history of science and shows that methods of calculation, classifications of objects, and organization of scientific and administrative institutions were all interrelated till the eighteenth century\(^\text{94}\). Thus, he agrees with the Edinburgh school of science studies, where questions of epistemology are also considered as questions of social order\(^\text{95}\). It is exactly the separation of the scientific from the political, of nature from society, which, according to Bruno Latour, exists at the very heart of the problem of the modern constitution. While modernity never fully realized the separation, it has strategically used it to direct and govern different forms and scales of life\(^\text{96}\). The breaking up of substantive reason into particular logics led to a certain specificity in their use that sheathes their ability to link diverse fields. Calculations have the ability to act


\(^{94}\) This is also evident by the fact that in both Germany and in France, it was, Gottfried Leibniz and Antoine Lavoisier, two scientists with work on probabilities and statistics that set up programs and institutions for official use of statistics in government.

\(^{95}\) Stephen Shapin, David Bloor and Barry Barnes and others in the Science Studies Unit at the University of Edinburgh, in the late 1970s and 1980s, examined the social construction of scientific knowledge.

On the calculative rationalities of government

exactly at this point of separation as double agents; assigning on the
neutrality of their scientificity, they are able to legitimize and direct, yet
stripped from any political connotations. The common language of the
technologies of calculations in their diverse applications, establishes associations
between very different disciplines and practices, between architectures, modes
of production, distribution of labour, and their subjects. Calculations thus
existing as part of both architecture and government provide a middle
ground, where the two of them are linked. “Everything happens in the middle,
everything passes between the two, everything happens by way of mediation,
translation, and networks, but this space does not exist, it has no place”97. Looking
into moments in the history of calculus, we will be able to better understand the
connections between architecture and government.

Calculative practices have developed extensively since the sixteenth century
and often used to facilitate rationalities of governance and forms of power, from
the sovereign state that needs to maintain its strength to that of the market that
gradually rises as the most powerful influence in modern societies98. In these
historical processes, calculative logic also extends to the bodies, determining in
various ways the behaviours and lives of the subjects, individuals or collectives.
It acquires however an economic character when calculative logic aims towards
the benefit and profitability of the state, the market, and the individual interest.
It enables the collection and representation of information in ways that allow
rendering the world thinkable and manageable in terms of utility and profitability99. Hence, calculative rationalities can facilitate an economic logic
within the practice of government. In fact, they become intrinsic elements of the
market economy, and, one of the mechanisms through which the power of
capitalism is deployed100.

97 Ibid. 37.

98 Modernity for Foucault is characterized by the transition from feudalism to capitalism, the
formation of nation-states, urbanization and secularization, individualism, rationalization and
scientific methodology, that lead to the rejection of traditional social structures. See: Michel

Cambridge University Press, 1999), chapter 1, 15 – 40.

100 See: Deleuze, Gilles and Guattari, Felix, “The inscribing socius”, Anti-Oedipus, (London:
Bloomsbury Academic, 2013),163.
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The relationship between calculus and practices of government is a long and complicated one, but it becomes clear that it is in the late fourteenth and fifteenth century Europe that calculations started playing a more important role within western societies. This was a time of great changes in Europe that, while it saw the rise of Renaissance and humanism, it was also heavily affected by long wars and devastating pandemics. There was a strong increase on taxations and regulations from monarchs, that led to the eventual retreat of the authority of Church and the slowly emerging power of the under formation centralized states. In parallel, agrarian contracts started replacing the fading feudal system and a money-based market economy was gradually being formed. Interestingly, it is in that same period, that the Hindu-Arabic numerical system with the use of only ten digits and decimal numbers, starts having a common use in Europe and replaces the Roman numerals. It was brought to Europe by Leonardo Fibonacci in 1202, through the publication of his book Liber Abaci (The Book of Calculations) and aimed to replace the use of abacus by direct calculations. The simplicity of calculations made them easily applicable to mathematics, commerce, and craftmanship. This new form of mathematics was taught from the thirteenth century in Italy in the Abacus schools together with reading, writing, and bookkeeping. Students of these schools would develop their computing skills and acquire a good knowledge of arithmetic and geometry through practical problems and exercises that addressed issues of commerce, productivity, labour provision, spatial arrangements, the exchange of goods and money. It was in these schools that future merchants, accountants, craftsmen, surveyors, and even architects, would train. This increasingly large population of professionals

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1. Black Death claimed millions of lives after the mid-14th century in Europe, while the Hundred Years War between England and France, also began at the same time and lasted for over a century.

2. Although states existed in different forms since classical antiquity and even before, the modern state emerges in Europe in the 16th century.

3. Either in the form of agrarian capitalism or mercantilism, capitalism starts forming as the major economic system in Europe.


would develop the logic and practices of calculations that they could apply in the management of their lands, goods, and services. It is important to notice, that many historians position the development of the banking system that allowed for large accumulations of capital (based on the profit gained by interest on loans) in the Renaissance cities of the fourteenth century Italy\textsuperscript{106}. When the financial transactions start to be systematically recorded, double entry bookkeeping and accounting appear\textsuperscript{107}. These new practices pervaded, ever since, most of businesses, institutions, and individual enterprises\textsuperscript{108} and have contributed to the development of the modern economic rationality.

In parallel, different social groups challenge the authority of the monarchs, mainly on issues of taxation and legislation and form independent institutions and advisory parliaments (states of estates). A general problematic of government arises by the sixteenth century on “how to be governed, by whom, to what extent, to what ends, and by what methods”\textsuperscript{109}. Eventually, the state apparatuses that existed in the form of army, taxation, and justice, long before, become the institutions and practices that constitute the newly emerging states. It is important to point out that while till then, the sovereign would govern based on his wisdom and knowledge of human and divine laws, in the sixteenth century the regulation of power starts to rely not on the truth of religious texts, but on rational calculations. Michel Foucault at the end of his lectures on The Birth of Biopolitics notes: “What I tried to show is that from the sixteenth and seventeenth century it does not seem that the exercise of power was adjusted in accordance with wisdom, but according to calculation, that is to say, the calculation of force, relations, wealth, and factors of strength. That is to say, one no longer tries to peg government to the truth; one tries to peg government to rationality. It seems to

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\textsuperscript{106} Noble Foster Hoggsom, ‘Renaissance in Banking’ in Banking through the ages, (New York: Dodd, Mead & Company, 1926), chapter V, 60-70.

\textsuperscript{107} Luca Pacioli published 1494, Summa de arithmetica, geometria, proportioni et proportionalita, a book on practical mathematics, geometry and the first detailed description of double-entry system formalizing the practices of accounting and bookkeeping.

\textsuperscript{108} One can observe a clear parallel between the expansion of these practices and the formation of some proto-capitalist economies.

\end{flushleft}
me that we could describe the modem forms of governmental technology as control of government by pegging it to rationality.”

Following this, one could say that the theories of the social contract that appear in the late seventieth century demonstrate this calculative rationality. The surrender by individuals of their freedoms to the sovereign in exchange for peace and protection of their rights can be understood as a tactical action based on reason rather than belief in divine laws. It is a calculated exchange between the subjects and the sovereign that ensures the well-being of the subjects and thereby justifies the existence of the monarch. For John Locke, this rational and calculated agreement constitutes the civil and political society as the set of individuals who decide to be linked to each other through a juridical and political bond that eventually is formalized in the state, leaving behind any form of natural law. It is upon these theories that the later constitution of civil rights relies on. The politiques appear at the time, as the people who think, analyze, program and calculate the practice of government based on rationality. This way, one can note a transition from the juridical theological issues of sovereignty to the rational problems of the government of the state.

The techniques of government are developed through the calculative rationality of the state and the problem of government from the sixteenth to the eighteenth century is directly related to mercantilism as the main economic policy of the time. The calculations concerned the state’s wealth, taxes, circulation of goods, and people. In fact, the element of the population is crucial to these as a productive force and source of wealth. These rationalized practices become the ‘reason of the state’ (Raison d’État), the knowledge, analysis, and planning of the state in order to preserve and expand its domination. An administrative mechanism that did not exist previously, developed to acquire and manage the knowledge of the state and its population. Two of the most important agents of the state are formed, diplomacy and police. Police, having

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111 Except of that imposed by the will of monarch, Locke underlines.

a different content than the one it carries today was constituted as an institution distinct from justice, army and finance and was concerned with the calculations and techniques that allowed the state to expand its influence while sustaining its internal order\textsuperscript{112}. The police were directly linked to the regulation of urban developments, the coexistence of people, and the operation of the market through the circulation of goods. It was concerned with the number of people that formed the state and their life necessities and its aim was the wellbeing of the individuals in order to preserve the good regulation of the state\textsuperscript{113}. To achieve this, it employed a set of interventions that often relied on discipline. Through discipline, the police would classify, train, and normalize the population. Police put forward strategies that became integral to government. So, the problem of government is henceforth concerned not so much with the delimitation of territory, but with the arrangement, distribution, and circulation of people and goods within a market economy. Thus, the incorporation of economic issues within the management of the state becomes the object of government in the sixteenth and seventeenth centuries. A government that aims to the wealth of the state and the preservation of its power, finds the first point of reference at the market as a place of exchange through which the state’s wealth is maintained and expanded.

The knowledge of the elements and resources of the state was necessary for this process. The technical knowledge that was developed through the collection and tabulation of important facts, took the form of statistics. Etymologically statistics mean exactly this, the knowledge of the state\textsuperscript{114}. Censuses, the antecedents of statistics, can be traced back to ancient Greece and Rome. They had as their purpose the registration of people and their properties for purposes of taxation and military obligation\textsuperscript{115}. Modern


\textsuperscript{113} In that sense, it can be considered as the very beginning of the welfare state.


\textsuperscript{115} Nikolas Rose, “The social history of numbers” in Powers of freedom: reframing political thought, (Cambridge: Cambridge University Press, 1999), chapter 1, 201.
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statistics, though, Statistik\textsuperscript{116} developed in German universities of the seventeenth century through the Staatenkunde, the systematic study of the states, and the presentation of their characteristics in tables of information. This information was not always numerical\textsuperscript{117}. It was the English economist, William Petty who introduced a numerical and quantitative approach to these studies, through his study, Political Arithmetick, where he argued for an objective understanding of society based on the science of calculations and numbers\textsuperscript{118}. It is important to note that the science of police, the Polizeiwissenschaft, was developed in parallel to statistics in Germany in the eighteenth century. Books, manuals, and theories on the practice of administration were produced in German universities\textsuperscript{119}. Statistics in its numerical or non-numerical form were directly linked to the practice of police, which brought together government and administration. The police concretized and made visible its knowledge of the state and population through the statistics. These state statistics are one of the first forms of collecting, measuring, and recording information in the form of data\textsuperscript{120}.

In the eighteenth century though, the practice of police starts to be challenged by the économistes, later known as physiocrats\textsuperscript{121} who consider the regulation of the state harmful and the raison d’état as artificial rationality imposed upon the society and most importantly the market. Physiocrats considered that there was a fair price (bon prix) that could be obtained under free trade. The state should not regulate this naturalness but respect it, let it be (laisser-faire), and facilitate it. The market as well as society freed from any regulations is meant to be left to develop naturally. The problem of the economy as introduced by the

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{116} A concept by Gottfried Aschenwall for the systematic study of states based on collection of significant facts.
\item \textsuperscript{119} Nikolas Rose. “The social history of numbers” in Powers of freedom: reframing political thought, (Cambridge: Cambridge University Press, 1999), chapter 1, 201.
\item \textsuperscript{120} Data being a form of information that can be processed and understood.
\item \textsuperscript{121} The physiocrats set the foundations for the development of classical economics.
\end{itemize}
\end{footnotesize}
physiocrats stressed the importance of labour in the exploitation of land to be a source of wealth since it affects the cost of production. Under this perception, the population is considered not anymore as a collection of subjects to be disciplined, but a set of natural economic phenomena. Hence, over the eighteenth century the mechanisms of the market, thought in terms of natural processes, become the site for the constitution of truth and self-regulation of government. The market comes to be considered a place of veridiction, where exchange determines the value of things. Moreover, the market is used to evaluate governmental practices and direct the mechanisms of jurisdiction. This valuation depends on the utility of governmental interventions in the function of the market, which can be assessed through the application of a scientific methodology and rationality.

Hence, a new practice of government emerges during the eighteenth century, which is based on a rationality that follows the ‘natural order’ of society and most importantly that of the market and considers the effects of governmental processes in the economy. This practice of government is liberalism. Liberalism as a form of government calculates and plans only to allow for reality to develop. It can be defined as “a philosophy of limited government that respects the rights and liberties of citizens and employs the rule of law. As a practice of government, it uses the capacities of free subjects as among the means of achieving its purposes and goals. And political economy formed upon calculative rationality is an intellectual instrument within the practices of government in order to address the problem of economy and scrutinize the processes and regularities of the population and the market. It relies on the account of the effects of the governmental processes in the economy rather than their regulation or planning. The figure of the economic man (homo economicus) appears within this space, aiming to maximize utility and achieve economic profit. Individuals now inhabit the space of sovereignty, as both subjects of right and as economic men. This is where, the problem of homo economicus lies since it calls for a form of government that needs to be exercised in a space of sovereignty,

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122 This problem was constituted for physiocrats not in the towns that police supervised, but in the countryside.


124 Mitchel, Dean, Governmentality, 267.
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which is inhabited by economic subjects. As Foucault explains: “A new plane of reference is needed, and clearly this new plane of reference will not be the set of subjects of right, or the set of merchants, or economic subjects or actors. These individuals who are still subjects of rights as well as being economic actors, but who are not governable as one or the other, are only governable insofar as a new ensemble can be defined which will envelop them both as subjects of right and as economic actors, but which will bring to light not just the connection or combination of these two elements, but a series of other elements in relation to which the subject of right and the economic subject will be aspects, partial aspects, which can be integrated insofar as they belong to a complex whole. And I think it is this new ensemble that is characteristic of the liberal art of governing”225. The ‘new plane of reference’ is civil society. Civil society changes in the late eighteenth century to become the medium and governmental technology of liberalism through which, the juridical and political bonds of society can coexist with the economic ones226. This way, homo economicus, and civil society become intertwined. Civil society becomes a concrete ensemble of economic and at the same time political people and is born through the interplay of the economic and political relations of power227. It is not anymore only formed by the social contract that Thomas Hobbes and John Locke describe and that takes the form of the legal and political state, but also by the realm of economic relations and individual interests within the market.

Hence, by the late eighteenth century, the practices of government have developed through two very different ways; a revolutionary and a radical one; “One based on the rights of man, and the other starting from the independence of the governed”228. The first one is linked to the events of the French Revolution; it defines the rights of people and deals with their limitation or exchange. This builds on the tradition of the seventeenth century theorists of law and the concept of the social contract. While the second one is based on the

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227 Different conceptions of what constitutes a civil society have been developed through history. The concept can be traced back to Aristotle’s Politics and the definition of κοινωνία πολιτική, while it was completely reformed after Enlightenment and the emergence of market society.

utility of governmental practices for the people. It is a practice that starts from the point of view of the governed. This is a radical approach that is developed in the late eighteenth century in England and based on utilitarianism as a governmental practice that directs its actions towards desired ends. In these two distinct ways of government, the calculative rationalities of government have taken two different forms\footnote{Ibid., 311-313.}. The first one relies on calculations of the state, in order to regulate society and the market towards its wealth and survival. This refers to the market as a place of exchange that regulates people through police, discipline, and the uses of the law. The second practice relies on the calculations of the individual interests of the governed within the market. This refers to the market as a place of veridiction for the utility of governmental practices that are employed upon civil society\footnote{Foucault relates these two different approaches to government to two specific groups of people. The first one to les politiques of the 17th century and the second one to les économistes of the 18th century. See Lecture Thirteen in Security, Territory, Population, Lectures at the Collège the France, 1977-1978.}.

The formation of welfare policies by the liberal western states in the late nineteenth century can be understood as emerging from within these two forms of government within civil society. One could suggest that it was built upon the practices and mechanisms of the first in order to serve the second. Although liberal government is to be self-limited in order to allow for the market to operate, it also requires taking measures and public policies upon the population that depends on their utility for the uninterrupted operation of the market. This way, liberal government needs to distinguish between actions that must or must not be taken, to not intervene in the market, but at the same time sustain the liberties of the people as independent economic agents. It is this way, that liberalism has used the regulatory and planning abilities of the state. For Nikolas Rose, liberalism came with the belief that law alone was not sufficient in achieving security in a population and that rather government from a social point of view was necessary. The invention of civil society and the social realm attempts to bridge this gap between the rule of law and economic interests within society. The effort of foregrounding social relations stressed the aspect of belonging into a wider collective or a community and delineated a clear portrait for the social citizen.” Social implied a kind of anti-individualism: the need to conceive of human
beings as citizens of a wider collectivity who did not merely confront one another as buyers and sellers on a competitive market.\textsuperscript{131}

As we saw, by the nineteenth century there was already a wide use of statistics. Births, marriages, poverty, illness, crime, urban space would be known, calculable, and accounted for in governmental planning. These attributes describe the social and economic conditions of a population. With industrialization in its full development, the intensification of capitalist production (and accumulation of wealth), and the overpopulation of the big cities with people in need of work, the poverty of the population and its bad living conditions became an important problem in Britain. However, it is in Germany, in the late nineteenth century, where the state starts to become responsible for some welfare provisions for the population. Previously, welfare provisions were usually provided by the family, by feudal lords, the guilds and municipalities, or by independent charities and most importantly the church as philanthropies. In any case, they did not constitute part of a state’s laws and responsibilities. The first welfare initiatives are considered the schemes put forward by the Conservative Chancellor Otto von Bismarck in Germany between 1883 and 1889 and provided sickness insurance, accident insurance, disability insurance, and insurance for the old age, in a form of pension to the industrial workers.\textsuperscript{132} These measures were part of an effort to bring unity in the state and to support industrialization by developing a connection of the workers to the state. They aimed to sustain a strong and reliable labour force with improved productivity and work output. In parallel, they challenged any revolutionary ideas, while promoting internal economic growth. Germany as many European countries had by the late nineteenth century developed a police state whose practices were informed by statistics and a clearly established raison d’\textit{état}. The development of welfare policies built upon and extended these practices. Many European states followed the example of introducing welfare initiatives, especially during the twentieth century.

Nonetheless, these initiatives can be considered as part of what Karl Polanyi calls the ‘double movement’ of market societies. This double movement is the


\textsuperscript{132} See about Bismarck’s state socialism in Foucault, Michel, The Birth of Biopolitics, Lecture Five, 7 February 1979, 101-129.
embedding and dis-embedding of market forces within society as the forces of economic liberalism of the market create precarious living conditions, then a reaction comes from the society towards social protection in the form of welfare provision\textsuperscript{133}. For Polanyi, this was a result of labour and land among other things, being transformed into what he named as “fictitious commodities” exposing these into the vulnerabilities of the market leading people who depend on these to social dislocation and misery. This part of the argument that Polanyi proposes in his book The Great Transformation (1944) is that competitive markets were created because of the expansion of capitalist institutions, of the industrialization, and of the facilitation of these market operations by the state. While this was not the case in the past when the economy would be on reciprocity and redistribution across personal and communal relationships\textsuperscript{134}. Whereas the separation of economic and political realms allowed the formation of self-regulating markets, in reality, the nation state and the market economy are not separate but, part of a market society. For this reason, Polanyi would oppose the approach that state and market are oppositional forces. Instead one could argue that the state often sustains and supports the operations of the market. As we will see in the next part, this was the case in regard to the welfare reforms that were implemented by the British state.


\textsuperscript{134} This is also a transition that Max Weber notes in “The Disintegration of the Household: The Rise of the Calculative Spirit and of the Modern Capitalist Enterprise” in Economy and Society, eds. Roth, Guenther, Wittich, Claus, (California: University of California Press, 1978) Vol.1, 375-380.
2.2 The construction of a milieu: Institutional architecture, modernism, and the welfare state in Britain.

This part of the thesis describes the historical context within which the research takes place, and presents the construction of a milieu, which identifies as the result of the welfare state policies in Britain during the 1960s and the institutional modernist architecture produced for it to reflect on the effects upon the British population. It is within this historical and socio-political context that the examined case studies are situated. It is important to underline here that the formation of this milieu and most importantly of the modern welfare state needs to be understood (as previously explained) within the development of liberal government and the deployment of liberalism that attempted to resolve the serious social problems that emerged from the development of capitalism and the extreme industrialization. This presentation will try to inform the investigation on the formation of the individual as a social subject by the institutions and the architectures of the welfare state, but also to understand the social and political changes that took place during that period gradually moving from liberal to neoliberal forms of governance. The literature on the subject is broad and diverse, spanning from issues of political economy and public policy to the political and architectural history of that period. As it is not the aim of this research to provide a detailed history but to theorize specific aspects of it in relation to architecture, the extent of this exposition will be confined.

In Britain, the welfare provisions can be detected much earlier. It is in the Poor Law system (Poor Law Acts), which existed continuously since the Elizabethan era (1598) till the establishment of the modern welfare state, where the origins of the British welfare state can be found\textsuperscript{135}. For a long time, poverty was considered a social burden that had to be disciplined and corrected. The poor relief practices were organized as philanthropies\textsuperscript{136} around the administrative units of the parishes but after 1723, the reception of relief was to be earned by living and working in workhouses under extremely difficult conditions. The Poor Law Acts remained almost unchanged through the centuries till the liberal reforms at the beginning of the 20\textsuperscript{th} century. In the late nineteenth century, the effects of

\textsuperscript{135} For more details on these see Bruce, Maurice, "Backgrounds and Beginnings", The Coming of the Welfare State, (London: Billing & Sons), 32-57

\textsuperscript{136} For more details on this transition read: Le Texier, Thibault, "De la philanthropie au welfare" in Le maniement des hommes, (Paris: La Decouverte: 2016).
intense industrialization, urbanization, and degradation of the living conditions made necessary a series of initiatives. The major factor for poverty was the low wages for men and even lower for women. Unemployment and irregular employment were important factors, as were the old age, disability, widowhood. Between 1867 and 1928 the acquisition of voting power by the working class with the reform acts that took place, as well as the threat of socialism after the 1917 communist revolution, put great pressure on the state to offer social and economic provisions to people. Britain by the early twentieth century was far from a ‘land of hope and glory,’ the social division and contrast were a cruel reality. As George Hamilton, the chairman of Poor Law Commission at the time, had noted: “The object and incitement of the nineteenth century was to accumulate wealth, whilst the duty of the twentieth century is the more difficult task of securing its better distribution.” The liberal governments between 1905-1915 took up this task. This signaled a change in the direction of British liberalism since historically liberalism considered that the main threat for liberty came from the state. However, in the early twentieth century, with the rise of poverty, there was an increased view that other factors such as unemployment, sickness, and poverty that were linked to the concentration of capital and the unequal distribution of wealth, can also threaten the liberty of an individual. This initiated a change from a laissez-faire attitude towards a more active government for the preservation of people’s freedom.

The liberal welfare reforms that took place at the beginning of the twentieth century in Britain, included an Education Act (1907) that provided free schooling and meals to students, the Old-Age Pensions Act (1908) that introduced pensions for those over the age of 70, the Labour Exchanges Act (1909), the Trade

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141 William Beveridge had worked on Labour Exchanges initiating the registration of unemployment and employers needs in order to facilitate an exchange of labour.
Boards Act (1909) created boards to set minimum wage criteria, and the National Insurance Act (1911), which put the foundations for the later formation of the National Health System. This effort was modeled upon the paradigm of the Tredegar Medical Aid Society that was founded in Wales in 1890, where the contributions of its member were directed towards their health care and pension. Previously the Conservatives had put forward an Unemployment and Children’s Act (1905). In parallel, from the end of the nineteenth century efforts were made to clear the slums and provide decent housing conditions for the working classes following the Housing Act of 1890. The first scheme to provide social housing was realized in Liverpool in 1869, but the actual changes in housing conditions started taking place after World War I. The liberal welfare reforms were funded by ‘the people’s budget’, a finance bill that passed in 1909. In reality, the insurance and taxes imposed by the state and the contributions of the working classes covered the cost of these services. So, there was not an actual transfer of wealth. Upon the Wall Street and London exchange stock market crashes of 1929, the economic crisis that took place in the 1930s had devastating effects mainly in the industrially developed countries. In Britain, the Poor Law Acts were amended in 1930 to transfer responsibility and become guidance of government for local authorities, while the workhouses were abolished. These Acts ceased to have effect when the National Assistance Act was put forward in 1948. In USA, president Roosevelt put forward a series of programs, financial reforms and public work programs between 1933 and 1936 that aimed to relieve and boost the American economy and society. In other countries and most importantly in Germany, economic depression accelerated the rise of extreme nationalism and fascism with the eventual outbreak of the World War II.

There are numerous economic theories regarding the reasons for the Great Depression. The three main ones are the Keynesian approach, the monetarist, and that of the Austrian economic school. The monetarist approach proposed by the economist Milton Friedman is that this was caused by a banking crisis that led to a monetary contraction. While for the economists of the Austrian school it was also the initial expansion of money supply which led to an economic bubble and eventually to a credit crisis in the banks. The explanation which is based on the ideas that John Maynard Keynes developed in The General Theory of Employment, Interest, and Money (1936) is that the reduction in consumption led to deflation and loss of investments confidence in the markets, which made
holding money profitable and increased the economic recession as the circulation of money was limited\textsuperscript{142}. So, the lower aggregate expenditures and the collective non-investment can lead the economy to operate to low levels leading to the further decline of income and the increase of unemployment. For this reason, Keynes advocated for an active response by the public sector to sustain high levels of aggregate supply and demand, which would also guarantee employment. This would take place through the reduction of interest rates as a monetary policy that increases liquidity and for a fiscal policy that would be directed towards increased governmental support and investment in the economy. This interventionist approach to the economy was considered extremely problematic by other economists such as Friedrich Hayek, who in his book *The Road to Serfdom* that was published in 1944 suggests that governmental decisions over the operations of the market that promote collective and planned economic strategies rather than liberal and individualistic, would lead to a loss of freedom, to an oppressive society and eventually to fascism\textsuperscript{143}. He considered planning as an authoritative form of social regulation unlike the operations of the market that as he argued, allowed for the free adjustment of actions. Hayek’s ideas constitute some of the core beliefs of neoliberal thinking.

It is in the period after World War II that welfare states were established in Europe. According to The Oxford Handbook of the Welfare State, one can distinguish four models of welfare state\textsuperscript{144} : The liberal one in the English-speaking countries that relies on a combination of market reliance and of social citizenship schemes merely regarding healthcare. The continental one developed in Germany and France and relies on the protection of the income merely on the male worker through insurance schemes. The social democratic, which is that of the Nordic countries and in which the state carries universal responsibility for all its citizens and finally the southern in many Mediterranean countries covering only those within the market and providing only a basic


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welfare coverage. Whereas, the general definition of a welfare state varies depending on the focus on certain aspects of it. Will Arts and John Gelissen define welfare states based on the common properties that they demonstrate. “The general term welfare state is a label for a certain class of democratic industrialist capitalist societies, characterized by certain properties (i.e. social citizenship) or the fact that more or less extensive welfare provisions are legally provided, or in still other words, the fact that the state plays a principal part in the welfare mix alongside the market, civil society and the family.” The definition provided by Britannica stresses the aspects of equality and distribution of wealth to achieve a standard of economic and social wellbeing and considers the welfare provisions more as a form of government than specific characteristics of a state. “Welfare state is a concept of government in which the state or a well-established network of social institutions plays a key role in the protection and promotion of the economic and social well-being of citizens. It is based on the principles of equality of opportunity, equitable distribution of wealth, and public responsibility for those unable to avail themselves of the minimal provisions for a good life. The general term may cover a variety of forms of economic and social organization.” Asa Briggs’ definition focuses more on the state’s ability to direct market forces towards specific directions. It is “a state in which organized power is deliberately used in an effort to modify the play of market forces in at least three directions – first, by guaranteeing individuals and families a minimum income irrespective of the market value of their work or property; second, by narrowing the extent of insecurity by enabling individuals and families to meet certain social contingencies which lead otherwise to individual and family crises; and third, by ensuring that all citizens without distinction of status or class are offered the best standards available in relation to a certain agreed range of social services.” In general, one could say that a welfare state is a state that supports its citizens with a series of state funded social services, such as healthcare, education, and social security. Welfare provisions often took other forms such as public-private partnerships, but these are not being considered here as


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constitutive of the welfare state. In fact, it is precisely these modifications in the practices of at least the British welfare state that contributed to its eventual dismantling. Ian Gough and Bob Deacon in a more general definition suggest that the welfare states are characterized by “regulations that modify the behaviour of private actors to achieve publicly recognized goals”\textsuperscript{148}, by redistributing income through taxation towards welfare provisions. Although this is not always the case, welfare states do extend civil and political rights to include social and economic ones.

Thomas H. Marshall in his text on Citizenship and Social Class (1965) proposed that the welfare state achieved the expansion of citizenship to include not only civil and political rights but also social rights that were the claims of full membership to a community. For Marshall, liberal citizenship developed in parallel to capitalism. Civil and political rights were gained in the seventeenth and nineteenth centuries respectively, while social rights during the twentieth. Civil rights “did not conflict with the inequalities of capitalist society; they were, on the contrary, necessary to the maintenance of that particular form of inequality”\textsuperscript{149}. This inequality has been expressed in the formation and struggle of social classes. The constitution of the political and most importantly of social rights, however, challenged the inequalities between social classes. In that sense, according to Marshall “in the twentieth century, citizenship and the capitalist class system have been at war”\textsuperscript{150}. Although Marshall sees social rights (and the welfare state) as challenges to capitalism, Marxist theorists consider them a way through which the state managed to maintain consent on capitalism and eliminate dissension\textsuperscript{151}.


See also: Deacon, Bob, “Global Social Governance Reform.” Globalism and Social Policy Program Policy Brief 1, Stakes, Helsinki.


\textsuperscript{150} Ibid. 29.

According to certain analysts, the emergence of the welfare state can be considered as the result of the negotiation of the economic and social balances between the different economic classes and of the formation of certain institutions by the civil society and the state. It is an attempt to diminish the economic gaps through the socialization of consumption (cultural, medical, etc.) In a sense, it is a compromise that would avoid any form of up rise of the working classes; a counterweight to the inequalities, and the destructive effects produced by the capitalist economic processes. For Antonio Negri, this way the state recognizes "the political emergence of the working class while finding new means (through a complete restructuration of the social mechanism for the extraction of relative surplus value) of politically controlling this new class within the workings of the system." This signals a restructuring of capitalism and the emergence of a new form of state, in which, the dialectic of capitalist exploitation is socialized through the intervention of the state.

Jurgen Habermas also, in his analysis of the welfare state seems to agree with this observation. He writes: "State regulated capitalism, which emerged from a reaction against the dangers to the system produced by open class antagonism, suspends class conflict. The system of advanced capitalism is so defined by a policy of securing the loyalty of the wage earning masses through rewards, that is, by avoiding conflict, that the conflict still built into the structure of society in virtue of the private mode of capital utilization is the very area of conflict which has the greatest probability of remaining latent. It recedes behind others, which while conditioned by the mode of production, can no longer assume the form of class conflicts." According to Habermas, the welfare state needs to be considered as part of the attempts for emancipation from abstract alienated labour that is regulated by market forces and as originating in the socialist utopias that imagined a communal life of workers providing social labour in free association between them that was defined from the organization of labour itself.

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or with ideas for the disengagement of labour from income through the provision of a guaranteed minimum income to all. In that sense, the welfare state needs to be considered as ‘a lever for class pacification’. It attempted to provide emancipated living conditions not through the liberation from alienated labour or by revolutionizing the labour conditions, but within the operations of the bourgeois state.

World War II ended with the establishment of a number of organizations that aimed to regulate the economic and political exchanges between countries. A series of goals for the postwar period was set in the Atlantic Charter statement issued in 1941 by the British and the Americans. Among them, the importance of securing good economic and social conditions for all people and freedom from fear and want. The catastrophes of the war had created enormous social needs and the reconstruction projects fueled the postwar economic growth. It was the central and local government that carried the responsibilities of supporting the population during this period. This contributed to an increase of confidence in state government and the belief that it could be trusted with the responsibility to direct a postwar reconstruction program that would be for the benefit of the population. Social protection in the aftermath of the war made welfare provisions and state intervention acceptable. In Britain, the discussion for the post-war reconstruction had started since 1940. The coalition government of 1941 under the initiative of the Labour Party and the support by some of the Conservatives initiated a series of government committees which formed reports and blueprints for the required policies. A cross party-political consensus was formed that lasted till the advent of Margaret Thatcher in government (in 1979), which agreed on the importance of welfare provisions, the maintenance of full employment, and of social security. In parallel, there was an agreement that high state expenditure, mixed economy, and the regulation of the economy based on Keynesian

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157 The formation of the United Nations in 1945 aimed to help prevent future wars and preserve international peace. While the establishment of the Bretton Woods system the same year intended to regulate the monetary relations between western countries, controlling exchange rates while backing currencies with gold reserves. Finally, the formation of the North Atlantic Treaty Organization (1949) for the collective defense of the western countries played an important role during the Cold War.

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principles were necessary to sustain economic growth. While the intensification of the Cold War increased the competition for economic performance and social welfare, this consensus gave birth to a long period of economic expansion that many historians characterize as the golden age of capitalism. In 1957, the British Conservative Prime Minister, Harold Macmillan addressed his fellow Conservatives and the rest of the Britons with the statement that most Britons “have never had it so good”. He portrayed Britain in a state of prosperity with increased production, raised wages, and large investments. This was an accurate statement. Britain, together with most capitalist developed countries were in the middle of an exceptional phase that spanned from 1945 till almost 1975. This long period of almost thirty years was defined by peace, strong economic growth, welfare state care, full employment, and the development of a new consumer culture. This period ended with the collapse of Bretton Woods in 1971, the economic recession of 1973 that was triggered by the oil and stock market crisis and with a long period of stagflation that brought the social unrests of the “Winter of Discontent” (1978-79).

In Britain, the foundations of the modern welfare state, and the principles according to which, the state assumes responsibility for its citizens’ welfare, can be found in the report on Social Insurance and Allied Services (Fig.2.1) that was published in 1942 and prepared by William Beveridge (Fig.2.2), a state administrator with long experience on issues of unemployment. The report identified five evils that needed to be addressed by the state: want, ignorance, disease, squalor, and idleness. State interventions for social security, education, healthcare, housing, and full employment would resolve these problems and provide a minimum standard of living for British citizens. The report proposed a comprehensive system of social insurance based on a flat rate of contributions to the state by working people in order to receive security and adequate flat rate benefits in the case of unemployment, sickness, injury, and old age with a unified administrative responsibility by the state. The reliance of the scheme on

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60 Speech of Harold Macmillan, the Conservative Prime Minister, in Bedford in July 1957. Macmillan was in office between 1957-1963 and was succeeded by Harold Wilson, the Labour Prime Minister.

61 See: The National Archives: cab/66/31/27
contributions, demonstrated the liberal base of it as it did not aim at the complete redistribution of wealth and was dependent on personal responsibility. This way, the proposed reforms could develop within the operations of capitalism and this is the reason that they were welcomed by all the parties. The welfare state provisions covered the majority of the society, while the rich and the poor had equal rights to them. Nonetheless, they did introduce labour as the element according to which social rights were to be credited. As Étienne Balibar stresses: “This point is symbolic, but also economically crucial. Rather than saying that the poor were, from then on, treated like the rich, it is more accurate to say that the rich were treated like the poor, on the basis of the universalization of the anthropological category of ‘labour’ as the uniquely human trait. The majority of the social rights guaranteed or conferred by the state were effectively conditioned by the more or less stable engagement of “active” individuals in professions that gave them a status recognized by society as a whole. In a certain sense, work replaced family (or, at least, it competed with it) as the foundation of society.”

However, class conflicts still persisted, and women were initially considered only as spouses of active labourers.

It was the Labour government of Clement Attlee (Fig.2.3) between 1945 and 1951 that adopted the suggestions of the Beveridge report, which put forward and implemented most of the acts that formed the British welfare system. In terms of social security, Beveridge’s propositions were applied in the National Insurance Act of 1946 with which national insurance became compulsory and in the National Assistance Act of 1948 (Fig.2.4) that extended this assistance, replacing the previous Poor Laws. The National Health Service Act (Fig.5) that was put forward in 1945 and was applied in 1948 made possible the provision of free medical care for all the people by the British state and the establishment of a network of hospitals to be run by regional boards and supported by community

And http://www.nationalarchives.gov.uk/education/resources/attlees-britain/beveridge-report/


A series of education acts made education compulsory and free, most notably the Education Act of 1944. This way, education was not considered a financial burden by the families and the number of students attending education increased. As the acts attempted to create equal opportunities for students from different backgrounds, the age for leaving school was set to fifteen years for all and the grammar school fees were removed, while later acts, provided grants to university students and further expanded the secondary and higher education.

All these initiatives were supported by the development of the physical infrastructure of the educational system. The building of schools became a priority in the postwar period and there are many interesting architectural examples that resulted from the post-war school building programs. The expansion of universities also generated many architectural competitions and projects. Unlike social security, healthcare, and education, the provision of housing by the state to the ones in need, spurred disagreements as many considered that this should not be part of the social services provided by the state. Nonetheless, a priority set by the debates on postwar reconstruction was the urgent need to address the problems of housing and living conditions before the end of the war through the construction of shelters, temporary housing, and the clearance of slums. The provision of sufficient housing, as well as a well-planned environment, were main concerns. The Housing White Paper was published in 1945 setting the Labour's Party objectives on this and the first plans for housing were put forward between 1942-45. The initial measures were directed towards covering the large post-war housing needs (Temporary Housing Program 1945) by building new houses, the largest percentage of which (over 80%) were council houses. This was facilitated through the offering of construction subsidizers that encouraged the construction of new houses. Interestingly, both the Labour Party and the Conservatives eventually made commitments to build a large number of houses annually (300.000 promised by the Conservatives in 1951). Specific regulations regarding the offering of social housing as well as their quality standards (according to Parker Morris report 1951)

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166 For more on this see p.72.
were also established by these acts. The implementation of these measures, the design, and construction of the new houses and towns were mainly the responsibility of the local authorities, often through their collaboration with housing associations and corporations.\textsuperscript{168}

\footnote{168 For a detailed history of social housing in Britain and an analysis of the changing politics, see: Boughton, John, Municipal Dreams: The Rise and Fall of Council Housing, (London: Verso books, 2018), and Manoochehri, Jamileh, The Politics of Social Housing in Britain. (Bern: Peter Lang, 2012).}

Fig.2.1 - The report on social insurance of 1942. *

*The credits for all photographs and illustrations can be found on pages 290-291.
Fig. 2.2 – William Beveridge, who proposed the welfare reforms.

Fig. 2.3 – The Labour Prime Minister Clement Attlee (1945-51). Attlee’s government put forward a series of Acts that formed the welfare state in U.K.
Fig. 2.4 – Extract from the National Assistance Act, 1948.
Fig. 2.5 – Extract from the National Health Service Act, 1946.
An important aspect of these acts was the control of land ownership as no land could be developed without prior consent from the local or central authority. Since 1938 a commission on the Distribution of the Industrial Population (Barlow Commission) had put forward the problems of industrial and town planning and the decentralization of industry and of population.\textsuperscript{169} It became gradually obvious that the social and economic reconstruction of Britain would need to develop in parallel with the physical reconstruction of the country. The debate regarding the postwar reconstruction would take place in a series of committees, in the R.I.B.A. Reconstruction Committee, the Town and County Planning Association (T.C.P.A.), the National Trust, the Architecture Science Group, the Association of Architects, Surveyors and Technical Assistants (A.S.T.A.) and others. A common result emerged from these debates, the need for planning by the state and the establishment of a Ministry of Planning. In 1942 the Ministry of Works and Planning was established, which was later named Ministry of Works (1943-1962) and Ministry of Public Buildings and Works (1962-1970). Other ministries involved in these postwar building programs for the formation of the welfare state were the Ministry of Town and Country Planning (M.T.C.P. 1943-51) that after 1951 was renamed to Ministry of Housing and Local Government (M.H.L.G. 1951-70), the Ministry of Health and the Ministry of Education. In parallel, the local planning authorities were responsible not only to approve but also to plan and realize developments themselves. For this purpose, it was necessary that the county councils prepare development plans, which would be inspected by the central government and the relevant ministries. The County of London Plan\textsuperscript{170} (Fig.2.6) for example, that was prepared for the London County Council (L.C.C.) by Professor Patrick Abercrombie and chief architect John Henry Forshaw in 1943 was one of the first such initiatives\textsuperscript{171}. The plan considered London in relation to the surrounding areas, the transport network, and uses of land. It put forward the separation between housing and industries, the creation of communal spaces and infrastructure, based on sociological research in order to address the problem of


\textsuperscript{171} Abercrombie was professor of town planning at University College, London and Forshaw was appointed as architect to the London County Council in 1941.
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overpopulation. Similarly, following the recommendations of Barlow Commission (1938), the Ministry of Town and Country Planning put forward the New Towns Act in 1946 (Fig.2.7) and the Town and Planning Act in 1947 that required permission and an increased tax for any land development, transferring the control and the regulation of land to the local planning authorities. Within this context, the New Towns Act resulted in the construction of large number of new towns by the state, which became some of the most interesting architectural and urban experiments of the post-war period. Through the building of new towns, housing, and schools the post-war Labour government initiated the largest part of architectural construction. In most of the cases, these projects were planned, designed, and built by the county boroughs and local councils with the supervision of the Ministry of Town and Country Planning (M.T.C.P.) and the Ministry of Housing and Local Government (M.H.L.G.) after 1951.

Fig. 2.6 – Social and functional analysis map of the county of London produced for The County of London Plan by Patrick Abercrombie and John Forshaw in 1943.
Fig. 2.7 – Extract from the New Towns Act, 1946.

However, this required the recruitment of a large number of specialized staff, architects, engineers, planners, and surveyors. In the past, ministries and the local authorities provided very limited opportunities for these professions, but this started changing after the first world war when after the initiative by the
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architect and planner, Raymond Unwin, regular employment was provided by the British government to some of these professionals in order to assist with the first government subsidized housing schemes and the works developed by the Ministry of Health. Under the pressure of the post-war demands for the construction of a large number mainly of schools and houses, this became an urgent necessity and most ministries started forming architects’ departments, even if initially their responsibilities were limited to overviewing policies. In parallel, as Andrew Saint notes: “In the late 1940s the cities, counties, boroughs, and districts of Britain were showered with exhortations to plan and to build houses and schools as fast they could. Yet, most of them hardly knew where to turn for lack of staff and expertise.” There was a clear separation between national and local government that made the materialization of the policies difficult. For this purpose, ministries and local authorities started recruiting architects even straight from universities. In this context and to address the increased demands in production, architects in ministries and local authorities had to invent new ways of working and buildings. Characteristic is the example of Hertfordshire architect’s department, that under the direction of Stirrat Johnson-Marshall, who later became the Chief Architect in the Ministry of Education, pioneered an innovative system of design and production of prefabricated school buildings. The department developed a rolling program of standardization in prefabricated production that was based on a permanent cycle of design, production, feedback, and mass construction and which allowed for collaboration and exchange between users, teachers, designers, policy makers, and manufacturers. This approach had in its core the operation of development groups, which could work on long term solutions and strategies. Johnson-Marshall applied a similar approach to the operations of the Ministry of Education, which became an example regarding the methods it followed. The Ministry since 1949 formed development groups and was restructured so that it had two distinct branches (A&B), one charged with research, collaboration, and experimentation and one (the ‘territorials’) responsible for the detailed examination of the plans submitted by the authorities. This allowed for the communication between planning, policy, and design, and materialization as well


Ibid.
as for the collaboration between local and central government. This form of organization and work became an example that was followed by other ministries and local authorities between 1947 and 1964, such as the Ministry of Works, the Ministry of Health, and the University Grants Committee.

By the 1960s a large proportion (around 50% according to estimates) of architects in Britain were employed either directly or indirectly by the local councils and other governmental bodies. It is characteristic that the London County Council (L.C.C.) by the 1950s was one of the largest architectural offices in the world, employing around 1600 staff. The L.C.C. was established in 1889 and during the Liberal administration was responsible for the realization of the first housing schemes. In the post-war period, the architect’s department was divided into four divisions: schools, housing, planning, and general works. Under John Forshaw, the department became less stratified and hierarchical as ‘group working’ was introduced in teams of twelve to sixteen staff that would work on a design managed by a chief architect. This allowed for more autonomy and experimentation in each group. The projects developed at L.C.C. because of their scale and ambition and due to this atmosphere of freedom, were unique opportunities for the architects of the time to develop their ideas making a large impact with their works. An opportunity that could not be easily found in the private domain. As Elain Harwood notes: “Its size meant that it developed its own traditions, especially in the building of large comprehensive schools and housing estates, supported by model makers, furniture designers, quantity surveyors, artists”[374]. These efforts were further supported by the Research and Development Department. The monotony in design that was initially imposed by the value’s department was quickly overpassed and great new ideas were born in the architects’ department. Most notably, the work on school buildings that built upon the prefabrication experiments of the Hertfordshire council, as well as the work produced by the working groups of the housing division that proposed very

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In 1965 the L.C.C. was superseded by the Greater London council (G.L.C.), where the architects’ department had limited responsibilities. The G.L.C. was dissolved in 1986.
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diverse solutions for housing. In addition, the town planning division was
responsible for the slum’s clearance and the layouts of new estates, while the
division of general works for old people’s homes and the new towns housing
provisions. Until 1965 that it was superseded by the Greater London Council, the
L.C.C. was responsible for the largest programmes of planning, building, and
modernization in Britain, shaping the post-war living conditions and producing
some of the finest examples of modernist architecture that shaped London.

Nonetheless and despite the dissolution of the L.C.C., in the later 1960s, one
could still find great examples of innovation and architectural achievement,
produced in the local councils’ architects’ departments. For example, the
architectural experiments in housing designed and produced by Camden’s
architect’s department under the direction of Sydney Cook between 1965 and
1973, are considered some of the best results in the architectural design of that
period. The department was mainly formed by young architects that were keen
on experimenting and testing new ideas175. These housing projects aimed to
refrm previous efforts in social housing, especially that of high rise and high
density, proposing instead a better living environment based on the
communication between building, street, and nature and balanced relation
between private and public spaces. Most importantly, the achievement of this
group of architects lies in their ability to produce innovative work making the best
use of their given resources and navigating a strict bureaucratic context of
regulations. Indeed, during that period the councils had lost many of their
responsibilities and were merged into larger organizations that were much stiffer
and more impersonal. Apart from the different departments in local authorities
and ministries that till the 1960s played an important role, competitions were also
a means through which architects participated in the formation of the post-war
built environment, while many public authorities made direct appointments
through approved lists of architects176. Till the late 1970s, the public sector
provided the majority of opportunities for building although, the private sector
had also started to develop significantly after the late 1950s when the land

175 For more details on this read: Swenarton, Mark, Cook’s Camden: the making of modern housing,

176 For example, Leslie Martin had drawn such a list for L.C.C. and another one existed for the school
commissions by the Ministry of Education.
development and planning regulations were eased under the Conservative government.

The initial period from 1945 up to the mid-1950s was characterized by efforts for a social and economic reconstruction through state intervention. During this period, the central and local governments were merely responsible for the majority of building production while, the use of land, as well as the development of industries, were under state regulation and ministerial planning. The high taxation that was imposed on the private development of land, limited the private enterprises in construction, achieving the decommodification of certain aspects of it. This changed after the Conservatives came into power in 1951. In 1952, the abolition of land commission created a dual market in the development of land and opened the construction to private enterprises. In parallel, the subsidies for housing construction were reduced after 1952 and fully suspended in 1956. Thus, the focus moved towards creating a mixed housing economy that would involve both the public and the private sector based on owner-occupation subsidizing and the following decade to the renovation of the existing housing stock and the control of rent prices. Indeed, the priorities and policies of the British welfare state changed over time. The late 1950s and 1960s, when Britain had been formed as a welfare state, would be defined by a gradual opening to the forces of the market and by attempts of modernization that would make Britain more competitive. The deregulation of the building industry and the parallel limitation and contraction of the activities of local authorities would allow for the gradual prevalence of private enterprises in the building of housing and the increased construction of mixed use developments with speculative office and commercial buildings, shopping, and leisure facilities. The period from the late 1960s and the beginning of the 1970s brought the crisis of the welfare state. The thesis focuses precisely on this moment in the mid-1960s, where the beginning of the crisis can be identified within both the practices of architecture and of government.

178 Ibid.
179 For more details on this see: Bullock, Nicholas, Building the post-war world, Modern architecture and reconstruction in Britain, (London: Routledge, 2002), 277.
Lewis Mumford stressed the social importance of the post-war building programs in The Social Foundations of Post-War Building and proposed the foundation of postwar planning on family and the local region, addressing the biological, social and economic needs of people\textsuperscript{180}. Indeed, “the planning of the built environment – from new towns to social housing, to schools and universities, hospitals and health centres, to leisure and sports complexes, to arts centres – was one of the key areas in which the welfare state sought to achieve its ambitions of economic redistribution and social welfare”\textsuperscript{181}. One could argue that the welfare state implicitly attempted to achieve a de-commodification of certain domains of life such as healthcare, education, and housing. Architecture played a significant role in this initiative between 1945 and 1975, and its role in the formation and development of the welfare state has become an object of investigation recently.

The first important publication that analyzes the relation between the welfare state and the built environment is Swedish Modernism: Architecture, Consumption, and the Welfare State (2010), which is a collection of essays edited by Helena Mattsson and Sven-Olov Wallenstein\textsuperscript{182} that unravel the complex processes of modernization that took place in the formation of the welfare states. A second prominent publication is Architecture and Welfare State (2015) edited by Mark Swenarton, Tom Avermaete, and Dirk van den Heuvel that provides a curated overview of the architecture of the welfare states in western Europe\textsuperscript{183}. Within the British context although, there is a large bibliography


\textsuperscript{182} The publication examines Swedish modernism but also draws on other European and American examples that unravel the complex processes of modernization that took place in the formations of the welfare states. The book exposes the reality of multiple modernities that overcome the dominant narrative of the one-dimensional history of modernism. Most importantly, instead of focusing on issues of style, the book provides great insight into the political and social underpinnings of Swedish modernism and the bureaucratic background of the welfare state. Following a biopolitical approach, the book discusses the interplay between the individual freedom and the subjective desire of the rational and “reasonable consumer” and the social control imposed by the socio-economic planning of the modern state. Helena Mattsson, Reinhold Martin, and Joan Ockman in their respective essays offer insightful analyses on the creation of subjects based on the direction of desire, on mass consumption, and individual customization. This way, they expose the underlying operations of the welfare state.


\textsuperscript{183} The book scrutinizes a series of case studies that explore the architecture of the welfare state as a political project often with colonial dimensions, while it also stresses its link to a consumerist
covering the formation and development of the British welfare state, an explicit architectural account relating its policies to the architecture produced by the welfare state is still missing. Nick Bullock in his book Building the Post-war Britain (2002) and Elain Harwood in Space, Hope, and Brutalism, English Architecture 1945-1975 (2015), both provide detailed and significant accounts of the architecture produced in the postwar period. In both publications, the issues of reconstruction and the welfare policies are discussed often in detail; however, their focus is on the formation and development of modern and brutalist architecture, rather than on the operational role that this architecture played within the welfare state government practices. Bullock unravels how the reconstruction process and the development of modernism in Britain relate to the application of a series of design experiments during and after the war. While, Harwood, provides an excellent survey of the modernist and brutalist buildings and typologies that developed in the postwar period. Both Bullock and Harwood underline that the building programs of social reconstruction and welfare were initially based on a strict statement of priorities due to the shortage of both materials and labour. These priorities foregrounded firstly the construction of schools and housing, and then, the organization of industry with universities and hospitals to follow later on. There was a standardization of the building construction and a scarcity of resources, which interestingly brought a great amount of architectural and technological innovation and partly justified the adoption of modernist architecture.

These initiatives brought new ways of building houses and schools. The initial period between 1945-50, relying on limited resources, prioritized quantity over quality in order to address urgent needs. The large building programs relied on the use of standard designs and components, on serialization and prefabrication. These techniques were also employed in other constructions such as hospitals, stations, etc. As plans and layouts were based on the application of construction technologies and practical functioning, issues of style became secondary. However, these buildings started to also incorporate some of the modernist ideas...
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that had arrived in Britain since the late 1920s. After the war, a debate had started in architectural journals, magazines, and schools, regarding the appropriate architecture for these reconstruction projects. Although many were looking for an English architecture that would evoke a feeling of continuity and belonging, others such as the Modern Architecture Research Group (M.A.R.S.)\(^{186}\) were in favor of a completely new and modern architecture that would also signal the social changes that were taking place. Indeed, some of the first buildings produced by the under-formation welfare state for its citizens were modernist housing estates and schools such as the Spa Green Estate by Tecton (1946-1949) (Fig.2.8) and the Churchill Gardens Estates (1946-62) by Powell and Mayo. The initial scope of public housing programs was the provision of temporary housing, which often took the form of prefabricated houses. In overall, temporary or permanent, the housing produced by and for the welfare state in the period between 1945-75 was modern (in terms of the facilities and its construction technologies) and provided improved living conditions for a very large portion of the British population. Many of the buildings produced were some of the most interesting and significant examples of modernist architecture. Among them, the Bevin Court Holford Estate (1954) by Berthold Lubetkin, the Park Hill Estate (1957) by Jack Lynn and Ivor Smith (Fig.2.9), the Hallfield Estate (1951-58) by Denys Lasdun and Lindsay Drake, the Golden Lane Estate (1951-57) by Chamberlin, Powell, and Bon, the Alton West, Roehampton Estate (1959) by Howell, Killick and Partridge for the L.C.C. Architects Department, the Robin Hood Gardens Estate\(^{187}\) (1972) by Alison and Peter Smithson for Greater London Council (G.L.C.) (Fig.2.10), In the early 1960s, the interest was focused on high-rise buildings, which brought some interesting experimentation in projects such as the Balfron Tower (1963-67) (Fig.2.11) and the Trellick Tower (1972) by Ernő Goldfinger for G.L.C. and of Queen Elizabeth Square estate (1963-65) by Basil Spence. This also led to the development of mixed-use housing schemes such as the Brunswick centre (1967-72) by Patrick Hodgkinson and of Lillington Gardens Estate (1961-80) by Darbourne and Darke\(^{188}\). In contrast, the late 1960s and early 1970s moved away

\(^{186}\) The group was formed in 1933 by Morton Shand, Wells Coates, Maxwell Fry, some members of Tecton and others as a think tank for architectural modernism in Britain.


\(^{188}\) Information acquired from: Bullock, Nicholas, Building the post-war world, 169-245. Harwood, Elain, Space Hope and Brutalism, 47-115 Lowe, Rodney, The Welfare State in Britain since 1945 and other accounts of this period, 246-272.
from high-rise developments and introduced new typologies of low-rise high density social housing buildings that allowed for a direct access to the street, such as the Alexandra Road Estate (1972-8) (Fig.2.12) and Fleet Road Estate (1971-75) by Neave Brown and the Camden Architects Department.\textsuperscript{389}

Fig.2.8 – The Sadler House of the Spa Green Estate in Finsbury, built between 1946-49.

\textsuperscript{389} For a more detailed analysis on this see: Swenarton, Mark, Cook’s Camden: the making of modern housing, (London: Lund Humphries,2017).
Fig. 2.9 – The Park Hill Estate in Sheffield, constructed in 1957.

Fig. 2.10 – The Robin Hood Gardens Estate was built in 1972.
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Fig. 2.11 – The Balfron Tower by Goldfinger for G.L.C.

Fig. 2.12 - The Alexandra Road Estate (1972-8) by Neave Brown for the Camden’s Architecture Department.
At the end of the second world war, one third of school buildings were heavily damaged and had to be rebuilt or repaired. In parallel, the needs for an increase of one million students had to be addressed by 1954, initially in primary education. One of the immediate priorities after the war was the building and repair of existing primary schools. Ten thousand new primary schools were built between 1945-1973\textsuperscript{190}. The Ministry of Education in collaboration with the local education authorities (L.E.A.) was responsible for the development of the facilities. The building programs for schools would initially rely on prefabricated standardized solutions of precast concrete or on innovative aluminum system solutions. The design of the schools was often appointed to private architects by local authorities and the ministry. In the design of the schools of that period, one notes the development of innovative ways of design and construction, as it was the case with the Hertfordshire school construction prototypes that were formed in collaboration with manufacturers to address the changing needs of the schools’ operations\textsuperscript{191}. In addition, issues of classroom, playground, and lighting design were taken into consideration. Some interesting architectural examples from the production of primary and secondary schools by the British welfare state in the period between 1945-75 are the Hunstanton school designed by Alison and Peter Smithson (1949-53) (Fig.2.13), the Brandlehow Primary School (1950) and the Greenside School (1952) by Ernö Goldfinger, the extensions to the Sydenham School (1957) by Basil Spence and Partners, the Bridgnorth Secondary School (1958-59) by Lyons, Israel & Ellis and Colquhoun, the Pimlico School\textsuperscript{192} (1964-65) (Fig.2.14) by John Bancroft for G.L.C., and many others\textsuperscript{193}.


\textsuperscript{191} For an analysis on these methods and programs see: Saint, Andrew, Towards a social architecture: the role of school building in post-war England (London: New Haven: Yale University Press, 1987).

\textsuperscript{192} Demolished in 2008.

\textsuperscript{193} Information acquired from: Bullock, Nicholas, Building the post-war world, 169-245. Harwood, Elain, Space Hope and Brutalism. 165-205 Lowe, Rodney, The Welfare State in Britain since 1945 and other accounts of this period. 204-246.
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Fig. 2.13 - The Hunstanton school designed by Alison and Peter Smithson (1949-53)

Fig. 2.14 - The Pimlico School designed by John Bancroft (1964-65) for G.L.C.
In higher education, the end of the war accentuated the need for more university graduates that would acquire the required skills in order to participate in the industrial and economic growth of the country. The Barlow Report on Scientific Man-Power published in 1946 stressed this need. It was decided that the local education authorities (L.E.A.s) would cover the student’s fees and in 1953 grants to university students became mandatory. However, as the primary priorities of the post-war reconstruction were different, the funding for the material expansion of higher education delayed and was only realized after the 1950s and merely in the 1960s. The publication of the Report on Higher Education (Robbins report) in 1963 put forward a plan for the building of many new universities and the expansion of existing ones. The expansion of higher education played an important role in the transformation of the work conditions in Britain since it contributed to the professionalization of the workforce, the increase of the white-collar workers, and the growth of the economy of services. The projects for the construction of the new university facilities were initiated either through architectural competitions or through the direct appointment of architects. As the programs of university facilities were complex, but at the same time often autonomous, they allowed for experimentation and diversity in the proposals. Many of these new buildings would take the form of modernist architecture, realizing some of the largest and most important modernist projects of the twentieth century. The notable examples of the modern architecture produced for the universities most often funded by financial schemes of the British welfare state either through direct funding or low interest loan schemes are numerous. One can only briefly mention few of them: the Churchill College at Cambridge University (1958-69) by Richard Sheppard, the Harvey Court of Gonville and Caius College (1962), the William Stone Building of Peterhouse (1963-64) at Cambridge and the Bodleian Law library at St. Cross College (1958-62) (Fig.2.15) at Oxford University by Leslie Martin with Colin St. John, the Leicester Engineering School (1963) (Fig.2.16), the Andrew Melville Hall (1964), the Faculty of History at Cambridge University (1967) and the Florey Building at Oxford University (1968), by James Stirling, the Garden building at St.  

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395 Public expenditure on education rose from £400m in 1952 to more than £900m a decade later. Gillard, Derek, Education in England: a history, 2018: www.educationengland.org.uk/history  
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Hilda’s College in Oxford by Alison and Peter Smithson (1968-70), the Hilda Besse Building (1966) at the University of Oxford and the College of Estate Management at University of Reading (1970-3) by Howell, Killick, Partridge, the University of East Anglia (1970) (Fig.2.17), the S.O.A.S. library building (1973) by Denys Lasdun. 

Fig.2.15- The Bodleian Law Library, St. Cross College library (1958-62) at Oxford University by Leslie Martin with Colin St. John.

Fig. 2.16 The Leicester University Engineering Faculty designed by James Stirling (1963).

Fig. 2.17 The campus of the University of East Anglia designed by Denys Lasdun.
In an analogous way to the development of universities, the healthcare provisions by the state began straight after the war, the actual development of its physical infrastructure though, took longer time to be achieved. The Ministry of Health that was first established in 1918, expanded its activities and responsibilities during the war as it became part of the defense mechanisms of the country. This required the involvement of local medical services. With the end of the war, the proposals put forward in the Beveridge report and in the reports of other research groups foregrounded as necessary the incorporation of healthcare provisions in the social security plans that were under formation. The National Health Service Act was put forward in 1945, although it took three more years to be activated, it unified all the preexisting health care services in one system, the N.H.S. The Act established fourteen regional hospital boards, to organize the hospital services for fourteen large areas. In order to address the post-war needs in health care, the N.H.S. also developed in collaboration with the local authorities a network of healthcare centres. The health care centres were very few up to the 1940s. One of the earliest ones was the Finsbury Health Centre designed by Berthold Lubetkin and the Tecton. The L.C.C. put forward a plan of building 162 health centres in 1946 that would be developed in coordination to the Town and Country Act that was under elaboration. On the other hand, the different forms of hospitals were run by individual boards and were poorly funded. The Nuffield Provisional Trust provided one of the key funds for the development of hospitals in the post-war period. Nonetheless, by the 1950s the ageing of medical facilities and the inadequacy of hospital accommodation started to put pressure on funding of the building of new hospitals and the renovation of existing ones. This attempt to modernize the health services came with explicit instructions in regard to the design of hospitals. In 1955 the Nuffield Trust published its Studies in the functions and design of hospitals that provided an in-depth analysis of the functions of the diverse design elements in a hospital and proposed their scientific rationalization (Fig. 2.18 & 2.19). The use of space in the wards based on the pattern of movements, the arrangement of rooms and facilities, planning considerations based on population statistics, but even the

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198 It was established in 1940 by Viscount Nuffield, the founder of Morris Motors.

examination of the lighting, sound control, and the effect of colors were all included in the report. John Weeks and Llewelyn Davies had taken the roles of consultants for the Nuffield Foundation. The late 1950s brought intense criticism for the separation of N.H.S. in hospitals, general practice, and local health authorities and brought the idea of the establishment of district general hospitals.

Fig. 2.18 - The Nuffield report was published in 1955 and provided specific recommendations for the design of hospitals in Britain.

Fig. 2.19 - Patterns of nurses movements examined in the Nuffield study.

Information acquired from: Harwood, Elain, Space, Hope and Brutalism, 275-297
The Hospital Plan for England and Wales\textsuperscript{201} that was published in 1962 approved the development of district general hospitals for population areas of about a hundred and twenty-five thousand, aiming to place a general hospital in every community\textsuperscript{202}. Forty new general hospitals were to be built and another hundred and thirty-four modernized. The N.H.S. established its own architectural department in 1959 under the direction of William Tatton, which oversaw the building of hospitals, investigated its technical and environmental aspects as well as the implementation of new technologies. The design of the majority of the new hospitals was based on the provision of large outpatient departments that would serve a lot of people and smaller inpatient wards for the accommodation of patients. This separation would often take the form of the podium and tall slab model leading to a distinct hospital typology that Llewelyn - Davies had named as "matchbox on muffin"\textsuperscript{203}. Despite the eventual standardization of these large structures, very interesting experiments and tests of new ideas took place in the building of some of these hospitals. The Wexham Park Hospital (1955-66) and the Princess Margaret Hospital (1958-68) by Powell and Moya, as well as the Guy’s Hospital (1968-75) (Fig.2.20) by Watkins, Gray, and Woodgate developed the idea of the tall slab towers. The Northwick Park Hospital (1970) by Llewelyn-Davies Weeks Forestier-Walker and Bor proposed an undetermined growing architecture\textsuperscript{204} based on the application of cybernetic theory and the Royal Free Hospital (1973-78) (Fig.2.21) by Watkins, Gray and Woodgate pioneered the first applications of C.A.D. design in architecture.


\textsuperscript{202} Charles Webster in his books, The health service since the war (1958-79) and The National Health Service: A Political History, provides the political insight of the development of the N.H.S., highlighting both the 1962 program and the restructuring of the N.H.S that took place in 1979.

\textsuperscript{203} Hughes, Jonathan, "The ‘Matchbox on a Muffin’: The Design of Hospitals", The Early NHS Medical History, No, 44, 21:56.

Fig. 2.20 & 2.21 – The Guy’s Hospital and the Royal Free Hospital in London.
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As the British government took more responsibilities with the development of the welfare state in the post-war period, its physical infrastructure also grew. New government offices, civic centres, law courts, post offices, job centres, police stations, fire stations, telecommunication stations, were built under the supervision of the Ministry of Public Buildings and Works (M.P.B.W.). The Whitehall plan that is discussed in detail later in the thesis, reflects this expansion of the governmental structure and the attempts for its modernization. This expansion took mainly the form of institutional buildings, it was also reflected in the building of many cultural and leisure buildings by the British state that aimed to contribute to the welfare of the British population. The building of libraries, art centres, galleries, and theatres became part of the efforts of the state for equal access to culture and knowledge. These were the new “welfare palaces” as they were characterized. Such an effort could be considered the Festival of Britain that was organized in 1951 by the Ministry of Information and the Board of Trade to commemorate the Great Exhibition of 1851 and to make known to the British population the new technological and scientific achievements of Britain while advertsing the British products and design to the British population. For the purposes of the Festival that took place merely at the London South Bank, the Royal Festival Hall (1951) was designed and built by Leslie Martin for the L.C.C. This was the first of the cultural buildings that would form the South Bank Centre, which includes some of the finest examples of modernist architecture and which according to Elain Harwood records the progression of modernism in Britain among them the National Theatre (1976) by Denys Lasdun and the Hayward Gallery (1968) by Engleback, Herron, Chalk, and Attenborough.

According to Nicholas Bullock, it was through these building programs that modernism was established in Britain. Modern architecture was rather an exception until the war. Bullock provides a detailed account of the debates and

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206 Harwood, Elain, Space, Hope and Brutalism, xxv.


207 Bullock, Nicholas, Building the post-war world, xi-xiv.
Discussions that took place in the journals, magazines, and schools of the post-war period regarding the rise of the modernist architecture in Britain between 1945-55. Indeed, Richard Llewelyn Davies in 1956 stated that “the battle for modern architecture has been nearly, if not completely won” and John Summerson in his introduction for the exhibition 45-55: Ten Years of British architecture the same year, also confirmed this change in architectural generation. Thus, modernism was well established in Britain by the mid-1950s, even if it had taken very diverse forms. Most importantly, modernism had become the choice of not only of private clients but also of local authorities and the state. Bullock stresses the fact that most of the histories of modern architecture privilege the actions of avant-garde masters, which one can identify between 1925-28, while they play down the role of technical innovations and of widespread applications that contributed to the evolution of the modern movement. Henry-Russel Hitchcock in an issue of the Architectural Review of 1947 had indeed distinguished the post-war architecture into bureaucratic and genius. In this sense, the period between 1945-55 is especially important since it realized modern architectures through mainstream bureaucratic practices devoted to everyday building for the greatest number of the British population. Thus, the public sector through the architectural production that aimed to address the needs of the welfare state constructed the largest proportion of modernist architecture in its various forms.

The building programs of the British welfare state provided the perfect opportunities for architects to test their ideas and to further interpret the existing vocabulary of modernist architecture. Even if initially, the material conditions were limited, architectural variety and experimentation emerged.


210 In this text Hitchcock notes: “The re-emergence of teamwork in the planning and design of buildings in combination with the improved methods of factory production have resulted in a new architecture of bureaucracy. The procedure of work differs from that which went to produce the gothic building owing more to the development of scientific means for attaining mechanical precision than to any other factor. But parallel with the development of this architecture, there are still the few individuals working independently to create the architecture of genius, which is the prototypes that will set the standards in the next stage of bureaucratic development.”

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through the different uses of materials and the application of new building methods and engineering techniques. These experimentations eventually led to the invention of new typologies and new expressions of modernism. This is something that is also underlined by Kenneth Frampton in his text New Brutalism and the architecture of the welfare state 1949-1959\textsuperscript{211}. Frampton explains that it was in the London County Council architects department during the 1950s, that the streams of British modern architecture took two main forms: New Humanism\textsuperscript{212} was a humanized version of the modern movement based on the Swedish and Scandinavian paradigms of welfare state architecture that the architects of L.C.C. initially practiced and many architectural critics, notably Nicholas Pevsner advocated as the way to provide an Englishness in the new buildings. New Brutalism, on the other hand, was born also within the L.C.C. partly as a reaction to New Humanism and the populism of the Festival of Britain. Alison and Peter Smithson briefly worked there and many of their colleagues became immediate sympathizers of this new architecture\textsuperscript{213}. As Reyner Banham has underlined: “The New Brutalism has to be seen against the background of the recent history and in particular the growing sense of the inner history of the modern movement itself.”\textsuperscript{214} The difference in the architecture produced for the two blocks of Alton Estate (East and West) in Roehampton, clearly manifests these two tendencies. In contrast to Alton East by Oliver Cox (1958), the Alton West by John Partridge (1959) brought a new interpretation of the modernist language. However, these were not the first examples of such architecture. The Hunstanton secondary school (1949-54) and the house in Colville place, Soho (1953), both designed by the Smithsons, were some of the earliest examples. Actually, according to Banham, Alison Smithson had coined the term New Brutalism from Hans Asplund that first used it in 1950, in a description that she provided of the Soho house in The Architectural Design of November 1953. “...had this being built it would have been the first exponent of New Brutalism in


\textsuperscript{212} A title employed by The Architectural Review, ci/ 606 (June 1947), 199–204, and ciii/ 613 (January 1948), 8-22.

\textsuperscript{213} Among them was Alan Colquhoun, William Howell and Collin St. John Wilson.

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England\textsuperscript{215}, she mentioned. Discussing the same building on another occasion she had explained that “it is out of respect for the materials that we find the root of the New Brutalism... an understanding of the affinity which can be established between the construction and man...”\textsuperscript{216}. Indeed, as Banham explains in his text The New Brutalism, that the valuation of materials as found was one of its three main characteristics recalling Le Corbusier’s use of béton brut. The other two were the clear exhibition of structure and memorability as an image. These were the three main characteristics of this new form of modern architecture\textsuperscript{217}.

\textbf{Hence}, Bullock is right to stress the fact that “architectural progress should not be judged based on elites”\textsuperscript{218}. Indeed, the years between 1945-75 it was the bureaucratic state that completely altered the built environment in Britain and created a new urban landscape. Most importantly, through the architecture produced for the British welfare state, modern flats, schools and public buildings became part of the everyday life for a large portion of the population raising significantly their living standards. Moreover, this period brought the dissemination of modern architecture. The new public buildings and institutions of the welfare state promoted the idea of social equality and citizenship as they provided access to common infrastructures and equal opportunities for the majority of the population. In parallel, they created the image of a modern society and of New Britain. This way, the welfare culture carried an ideology of equality, but also of prosperity that was sustained by the conditions of full employment, social security, and economic growth that were assisted by the state at the time.

The social dimension of the modern architecture produced for the institutions of the British welfare state can be related back to the application of modern architecture in the social initiatives of Red Vienna\textsuperscript{219} (1919-34), of the Siedlungen

\textsuperscript{215}Smithson, Alison, Architectural Design, November 1953, 342.


\textsuperscript{217}Banham, Reyner. “The New Brutalism”.

\textsuperscript{218}Bullock, Nicholas, Building the post-war world, 280.

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housing settlement programs of the 1920s in Frankfurt (Neues Frankfurt)\textsuperscript{220} and the discussions on existenzminimum (minimum dwelling) of C.I.A.M. 2 \textsuperscript{221} (1929) and even to the ideas on collective housing and urban planning of the Soviet constructivist group O.S.A. (1925-1930)\textsuperscript{222}. In all these cases, modern architecture carried a social purpose, although most often this was not fully realized as it was dependent on economic and political conditions. The idea that architecture through the reconstruction of the everyday life can provide in itself social reformation or even realize a utopia, was also proposed by Le Corbusier in the last chapter of Vers une architecture (1923)\textsuperscript{223}. There, Le Corbusier in the problem of addressing class inequalities within capitalism through architecture or revolution, eventually replies (although initially, he plays with the formal and political meaning of revolution), that revolution can be avoided through architecture. The welfare state reforms through the reconstruction of the built environment in Britain can be read in such a way; as attempts to redirect the development of capitalism. It is crucial to underline though, that as we saw, they did not take place independently of social, economic, and political reforms, which actually initiated them. Architectural design in itself did not and in my opinion, cannot provide such solutions. Manfredo Tafuri in Architecture and Utopia underlines that: “The ideology of design is just as essential to the integration of modern capitalism in all the structures and superstructures of human existence as is the illusion of being able to oppose that design with instruments of a different type of designing or a radical anti-design”\textsuperscript{224}. Indeed, architecture within capitalism cannot but participate in its organization of production and consumption, in that sense it can only be reformist rather than revolutionary.

\textsuperscript{220} The public housing program that was realized in Frankfurt between 1925-1930 and in which, many modernist architects contributed with their work. Mark Stam, Walter Gropius, Bruno Taut and others.

\textsuperscript{221} The 2nd Conference of the Congrès International d’Architecture Moderne (C.I.A.M.) took place in Frankfurtam-Main in September 1929 and discussed the minimum habitable dwelling.

\textsuperscript{222} The O.S.A. group was active between 1925-30 in U.S.S.R. and proposed architectural constructivism in the service of social and political purposes.


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For Tafuri "It is significant that almost all the economic objectives formulated by Keynes in his General Theory can be found, in purely ideological form, at the basis of the poetics of modern architecture"\(^\text{225}\). The modern architecture of the interventionist state was able to organize production and distribution of consumption in the city based on state’s plan for building. This ideology of the plan anticipated and guaranteed the future economic activity. When the interventionist Keynesian state, as underlined by Negri and Habermas\(^\text{226}\) becomes the mechanism to sustain the economic viability of capitalism, then the ideology of the plan in modern architecture that aimed to project and organize the future of the city is taken over by capital. This, for Tafuri, signals the crisis of modern architecture. ‘The crisis of modern architecture begins at the precise moment when its natural target - large industrial capital - makes architecture’s underlying ideology its own, setting aside the superstructures. As of that moment architectural ideology has exhausted its own function’\(^\text{227}\). Therefore, architectural ideology cannot operate autonomously of political ideology and economic base.

As the welfare state and the British economy grew in the 1950s, the priorities also changed. When the Conservatives came into power in 1951, although they did maintain all the welfare provisions in parallel, they removed many of the restrictions in the planning and regulation both of the economy and of the built environment, opening them to the forces of the capitalist market. As Bullock notes, the focus moved from reconstruction to modernization. When the 1960s started to unfold, the British welfare state was in its full development with more hospitals, universities and new towns to be built for its provisions. As we will see further on, by the mid-1960s, the welfare state had taken the form of a big bureaucratic and technical governmental machine that was focused on the production of quantifiable outputs for the British population. Nikolas Rose and Peter Miller relate this technicisation of government to what they name as


\(^{226}\) An elaboration on this can be found in page 57 of the thesis. See also: Amhoff, Tilo, ‘Architecture as the Ideology of the Plan’, Revisiting Manfredo Tafuri’s Critique of Ideology, Paper presented at The International Conference Architecture and Ideology, Ilija Milosavljević Kolarac Foundation, Belgrade, Serbia, Sept 2012.

Welfarism is a mode of government in which programs, technologies, bureaucratic and calculative capacities are linked to the government of social life. They explain that: "Diverse programs sought to transform the welfare state into a calculable universe in which entities and activities would be mapped, enumerated, translated into information, transmitted to a centre, accumulated, compared, evaluated, and programmed." This way, "welfarism facilitates the creation of domains in which political decisions are dominated by technical calculations." In parallel, the prosperity and opportunities provided by the welfare state in the postwar period had formed a new relatively affluent middle class of professionals and consumers. The mechanisms of such a change are going to be examined in more detail, in the later parts of the thesis. However, it is essential to note that by the mid-1960s individual freedom and the opportunity to choose started to characterize the priorities of British society. This was also evident among professional architects that started to leave the government departments and local authorities to form private companies. As expectations rose so did criticism towards the welfare state that started to become stronger. The growing criticism focused on the planning and regulatory practices of the welfare state, as well as its rigid bureaucratic practices and the institutionalization of social life.

A social institution is "any persistent structure or mechanism of social order governing the behaviour of a set of individuals within a given community. Institutions are identified with a social purpose, transcending individuals, and intentions by mediating the rules that govern living behaviour." Bearing this


229 Ibid. 194.

230 Ibid. 196.

231 The issue of consumerism within the developed welfare state is discussed within the Swedish context in the book Mattsson, Helena and Wallenstein, Sven-Olov, eds. Swedish modernism, architecture, consumption and the welfare state (London: Black Dog Publishing, 2010). One can draw interesting parallelisms regarding similar changes that took place in Britain. Although the Swedish welfare state both in its form and historical trajectory differentiates from the British one, the issues of consumption and consumerism were common elements in most of the advanced welfare states, especially after the 1950s. Helena Mattsson in "Designing the reasonable consumer" and Reinhold Martin in "Mass customization, consumers and other subjects" provide in depth analysis of these changes in relation to the formation of the consumer as subject.

definition in mind, one can understand that the welfare state through its planning policies, institutions, and building programs attempted to order and in a way to manage and implicitly govern the British population. For many, the welfare state applied a form of pastoral power and in that sense, one could claim that modern institutional architecture did operate as an apparatus of government for the welfare state. Jeremy Till in his text Modernity and Order: Architecture and the Welfare State, even provides an explanation for the affiliation between modern architecture and welfare state. He draws on Zygmunt Bauman’s argument that “the typical modern practice...is the effort to exterminate ambivalence” and is characterized by the will to order. This way, Till relates the ordering tendencies of modernism to the ordering tendencies of modernity and more specifically the need of architectural modernism to order with the need of the welfare state to order. In this sense, architectural modernism while presented as intended for the social good, in reality, aims to impose order. According to Till: “The functionalism of the welfare state is a mechanism for reordering behaviour: in the white, light-filled, spaces of ‘humane’ modernism, you will behave properly. The paternalism of the welfare state is spatialized in the frozen spaces of our social housing, hospitals, and schools.” And this is exactly where the architecture of the welfare state fails for Till, as life overcomes order. This is an argument, that aligns with the criticism of urban planning policies that Jane Jacobs put forward in her book The Death and Life of Great American Cities in the early 1960s that planning overlooked the complexities of city lives and the issues of heritage and character that were linked to the local communities. Instead, she advocated for a bottom up approach. Indeed, this was already an important issue within the discussions of the modern movement since the mid-1950s. Attempts to reform the modernist approaches on urbanism and planning had been launched by Team 10 with The Doorn Manifesto of 1954, that suggested to customize architectural solutions to the specificities of community living.

236 It was also the Smithsons through Team 10 that challenged the views of the modern movement on urbanism in the 9th Congrès International d’ Architecture Moderne (C.I.A.M.) that took place in 1953.
237 Published in Team 10 Primer, (Cambridge: M.I.T. Press, 1974).
Interestingly, the criticism of the faceless welfare institutions that oppressed and patronized individual freedom through the practices of a ‘nanny state’, was an argument shared at the time by both the political left and right by the late 1960s. Henri Lefebvre from a Marxist point of view argued against the anonymous urban institutions of the state that commodified urban life to serve capitalism\(^2\). Instead, he argued for a right to the city (1968) through the social production of space (1974). While, the rise neoliberal ideology also condemned the welfare state for intervening in the lives of individuals, creating dependencies, and controlling their freedoms and abilities to develop and prosper through the practice of personal choices and enterprises. Thus, the welfare apparatus of government was under severe criticism, but also transformation in the mid-1960s when it was in its full formation. It is exactly at that moment that the interest of the thesis lies in.

This chapter has described the conditions, ideas, and events that led to the historical formations that are under examination in the thesis. Initially, it traced a genealogy of governmental rationalities since the beginning of capitalism, indicating their calculative character. In the first part, the chapter demonstrated the birth and evolution of these calculative approaches and practices in government. One could argue that these practices have designated the historical events and political problems of the twentieth century, which this analysis attempts to illuminate. These historical events and conditions are presented in detail in the second part of the chapter that describes the construction of a specific milieu. In this frame, the introduction of the welfare reforms and eventually the establishment of the welfare state in Britain, which are the objects of inquiry of this thesis, can be positioned within a historical trajectory; they can be related to and viewed as part of the development of these calculative rationalities of government within capitalism and considered constituent in the formulation of relations of power between different political forces in the post-war period in Britain. As this chapter proceeds from the presentation of the different rationalities of government to the description of the specific social and economic policies, which were introduced by the British state, it becomes

Lefebvre, Henri, La Production de l’espace, (Paris: Anthropos, 1974).
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evident, how certain political ideas were manifested in reality and how politics were realized through specific regulations and policies. The materialization of these policies took the form of extensive building programs and the establishment of certain social institutions. This is clearly presented in the second part of the chapter. Thus, the rationalities of government, which are described in the first part, can be clearly related to the production of the built environment. This is essential for the thesis in order to establish and support its claim that actually the architecture produced by these initiatives, not only represents but in fact, realizes certain practices of government.

As we saw, the two main rationalities of government that are developed within capitalist societies both rely on rational calculations. In the first case, government is based on rational calculations that take the form of laws and regulations, which led to the formation of the social contract and the constitution of civil rights. In the second case, government is based on economic calculations, that prioritize freedom mainly as an attribute that is essential for the function of a capitalist market society. As this chapter demonstrated, the welfare reforms in Britain were the result of a negotiation between these two practices of government in the post-war condition. This negotiation and balance between these forces, has not been stable and has changed over time. The initial formation of the welfare state was based upon the tradition and practices of police, that managed the lives of people in urban developments and their circulation through the use of statistics and the imposition of regulations. It utilized the knowledge of the state and its resources and aimed at the government of the population through the establishment of a series of social institutions. The welfare policies and institutions provided to the British population healthcare, education, work security, and housing, and were materialized through the planning of the built environment and the construction of public buildings in service to the people. This way, an expansion of the rights of the citizens and a de-commodification of certain domains of life, was achieved. Nonetheless, one can claim that the welfare state utilized these institutions and the production of architecture to organize and socialize consumption in order to sustain a capitalist economy. The modernist architecture in Britain thrived within this context. As the welfare state expanded and was gradually technized and bureaucratized, the balance between the different social, economic, and political forces also changed. Both the welfare state and the modernist architecture produced for it were heavily
criticized for attempting to discipline and control the everyday lives of people and for applying a form of pastoral power, through the same welfare institutions, that were initially considered to be contributing to the wellbeing of the community. These criticisms and the development of a neoliberal ideology can be linked and traced back to a liberal approach to government as this was developed since the 18th century. This approach together with the promotion of the individual freedom to choose and act, also prioritized economy, and the market as the main factors that need to determine government policies. However, the thesis aims to delineate the complexity of these practices of government that not always work through the evident imposition of order from above or through the distinction between an interventionist and non-interventionist state. The thesis argues that it was through specific technologies and rationalities of government, which developed within the British welfare state and which brought its eventual transformation and transition into neoliberal forms of governance. It is this re-organization of rationalities and technologies that formed a new apparatus of neoliberal governance. It is upon these operations and practices of architecture and government, where the following investigations will focus.
OPERATIONS
A. A calculated plan.

This part of the thesis investigates distinct operations of the architectural apparatus by analyzing case studies and the corresponding governmental reports in order to trace the historical transition that these new architectural visibilities and political statements realize. Each of the case studies dwells on a particular moment in the history of the British welfare state in the 1960s and attempts to draw the connections between its dissolution, the emergence of new forms of neoliberal government and the changes in the design, function, and production of institutional architecture that accompany it.

The first moment that the thesis examines is the decision of the British government in 1963 to demolish the majority of government buildings in Whitehall to create a new modern government centre. By considering the calculus used for the plan, and expanding on its mathematical and philosophical history, the thesis aims to illuminate its application in both architecture and government, and indeed draw a parallel between the calculative practices in government and those employed in the design and production of the built environment. Thus, it attempts to question the ways in which the architectural applications of the calculus implicated both the economic and political aspects of the design process.

The thesis argues that although the Whitehall plan was meant to create a government and national centre for the welfare state that promoted the social provisions of the state for its population, in reality, the architectural calculus of the plan put forward a managerial rationality for both the work and social spaces that addressed the individual, not as a social citizen, but rather as a calculated individualized occupier, worker, and consumer. The plan thus participated in the formation of an abstract calculative machine, turning individuals into indivuals and allowing for the implementation of a form of governing at distance and the constitution of architecture as an apparatus of governance.
3.1 An architecture for the officialdom: the British civil service, modern bureaucracy and the Whitehall area.

The investigation of the first case study begins with the description of the historical formation of the British state bureaucracy and its physical realization in Whitehall area. This analysis will help us understand the governmental bureaucratic practices and their architectural manifestations. The initial character of the officialdom differed significantly from the later modern bureaucracies. Administrative bureaucracies were formed gradually within the absolutist regional states in Europe and Britain. Officials were employed by monarchs as advisors, to collect taxes, administrate the infrastructure of towns and negotiate with the different social groups, town corporations, local bodies, and estates. The growing numbers of these permanent officials constituted bureaucratic structures, which although initially were obliged to serve the will of the ruler, eventually led to the emergence of the independent institutions of the state. By the eighteenth century, new institutions were created and there was an evolution to more sophisticated administrative procedures both by the state and the public domain as well as by the market and the private enterprises. One notes a parallel change of attention from the juridical theological issues of sovereignty to the rational problems of the government and economy of the state. These newly formed bureaucratic services possessed important knowledge about the state and performed the functions that were essential to its existence and development. Public bureaucracy in the form of the civil service gradually becomes the locus of state governmental practice. Considering the changes within the society and the state at the time, one could say, that in many respects, the emergence of the bureaucratic civil service aimed to address exactly the administrative needs of the under formation, civil society, and social realm of the late eighteenth and nineteenth century. It introduced processes to negotiate and facilitate both economic and political issues thereby formalizing them into bureaucratic procedures. Calculative practices and rationalities thus become intrinsic operations in the formation of modern bureaucracy and constitute as such an essential part of the modern state. The governmental services collect and manage information through diverse resources. This allows for a large repository of information that can be used to preempt the management of people and the regulation of the economy.
In Britain, the tradition of assistants and advisors to the King goes back to the seventh century and the Witenagemot (the meeting of wise men) that was replaced by the Curia Regis (King’s council) in the eleventh century and led to the formation of the first parliamentary assemblies under the rule of Edward I in the thirteenth century, where nobles and clerics would meet to discuss matters of government and finance. After the British Civil War that culminated in the 1688 Glorious Revolution, the Parliament gained more power and British monarchy began its transition from an absolute to a constitutional monarchy initially through the Bill of Rights of 1689. This important change allowed for the expansion of the executive power of government and eventually increased the number and responsibilities of the officials and secretariats that would administrate the issues of government. The offices of the state started growing. One of the oldest state offices is the Office of Works\(^{239}\), which was responsible for the royal and state buildings and estates. Among the King’s surveyors and attached architects, one can find the names of Robert Adams, Inigo Jones, Christopher Wren, Sir John Soane, and John Nash. By the eighteenth-century institutions such as the Office of Works, the Navy Board, the Home Office (previous Southern Ministry) and the Foreign Office (previous Northern Ministry) were fully established. There was a splitting of responsibilities between the offices, but all of them still operated according to a traditional system of clerical duty and the influence of patronage\(^{240}\).

By the mid nineteenth century, it became increasingly clear that the existing practices needed to be reexamined in order to comply with the rationality and efficiency that the developing liberal capitalist societies were pursuing. Based on the example of the English East India Company\(^{241}\), the enterprise that established the first college to train administrators\(^{242}\), the Northcote-Trevelyan report was issued in 1854 shaping the British civil service in its modern unified form. It is worth mentioning that the English East India Company, which was established in 1600,\(^{239}\) It was established in 1378 and became the Ministry of Works in 1940 and ceased its operations in 1970.

\(^{240}\) For further information on the development of civil service in Britain since the 19th century, see Hennessy, Peter, Whitehall, (London: Pimlico editions, 2001).

\(^{241}\) An English joint-stock company that traded in the Indian Ocean region, Southeast Asia and later China.

\(^{242}\) For more information on this, see Wilkinson, Callie. “The East India College debate and the fashioning of imperial officials”, The Historical Journal, Volume 60, Issue 4, December 2017, 943-969.
was one of the first and most notable joint-stock companies\(^{243}\). Joint-stock transnational companies, which issue public and tradable stocks were and still are largely responsible for the constitution of the capitalist economic system. The British civil service in its modern structure carries many similarities to the economically effective capitalist private enterprises as they both become organized in a similar rational way to achieve their respective goals. The Northcote-Trevelyan report put forward four important recommendations for the reorganization of the civil service. The most significant of which was that the recruitment of civil servants would take place through competitive examinations and their selection and their promotion according to expertise and merit rather than favoritism and patronage. The civil service officers would need to have a good general education and strong arithmetic skills, to employ rational judgement and follow the written regulations. These parameters should create a unified, but independent and neutral from politics administrative state bureaucracy. This neutrality is also evident by the discreetness and anonymity that the civil servants were expected to demonstrate in the public realm, avoiding political discussions. The modern civil service was to be structured according to classes and grades. The report proposed a division between those responsible to engage in the formulation and realization of administrative policies as intellectual generalists and those occupied in the routine clerical work with executive officers mediating between the two. The full implementation of the principles of the report led to the reorganization of the civil service by the early twentieth century.

This modern bureaucratic structure of the British civil service came to support the first important interventions of the state in issues of public policy such as health, employment, housing, and infrastructure that the industrial revolution and extensive urbanization of the nineteenth century had intensified. The first welfare policies that were put forward by the Liberal Party government between 1906 and 1914 were implemented and administrated by the modern civil service that expanded significantly at the time in order to address these new responsibilities that had passed from charities and independent organizations to the state. The

\(^{243}\) It followed the example of the Dutch East India Company, which is one of the first transnational corporations to issue public tradable stocks. The English East India Company aimed at the exploitation of trade with East and Southeast Asia and India. Initially, it relied on monopoly and served the Imperialist practices of the British in India and Southeast Asia.
reforms initiated a more active government of the population that was directed towards the welfare of the ‘deserving’ citizens and as we saw in the previous part \(^{244}\), introduced policies regarding pensions, insurance, old age, employment, and economic development. This denoted a shift in the British government of the time from the accommodation of unregulated liberalism of self-interest to a state planning approach that recognized some social and economic rights of wellbeing to its citizens. This change reinforced the importance of the state’s administrative and executive units andemployed their rational organization into the planning and development of the first welfare strategies.

The collection and process of information is an important aspect of the function of civil service. Traced back to the seventeenth century political arithmetic, statistics flourished during the nineteenth century in Britain, and in 1832, the first statistical department was established in Whitehall \(^{245}\). Statistics summarized important information and provided a detailed overview of the state and its population. Calculations, as previously analyzed, gradually became essential tools in the executive aspects of government. To address the increased needs in data processing Herman Hollerith invented in 1889 the electro-mechanical data-processing tabulating machine, based on a binary system that used punch cards. This new technology was employed by the British state in the 1911 census and later for the police, employment, and insurance records, giving rise to an expert movement of statisticians and mechanizers within the civil service. Other types of technology that affected the transmission of information and communication in the administration of the state were the typewriter and the telephone. The implementation of these new technologies changed the capabilities and working patterns of government. Jon Agar in his book The Government Machine underlines that “Information technology is important to government because of the number of ways the two interact: government has always been a gatekeeper of information and a major user. Also, either as a large-scale buyer of machines or by intervening and setting industrial policy, government has significantly shaped the development of information technologies” \(^{246}\). For example, the technology of the

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\(^{244}\) See the more detailed account in part 2.2 The construction of a milieu.


\(^{246}\) Ibid., 12.
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electronic computer was developed within the British state establishments during World War II. The Colossus, one of the earliest digital electronic computers was built in Bletchley Park, the governmental codebreaking establishment in 1944, and by 1949 an advisory committee that was set up by the government to address the development of highspeed calculating machines. For a short period, the computers were used only as scientific machines, but very soon they started being employed in the everyday clerical work of the civil service. "Information processing by punched card could not generate statistical knowledge of the economy fast enough. Computers could produce that knowledge quicker, as well as new kinds of knowledge through different sortings. Changes in the organization of information collection and processing could expand and change the capacity to administrate."\textsuperscript{247} The 1950s and 1960s saw the gradual introduction of computers in different work processes of the civil service initially in the economic calculations of the Treasury and later in various forms of information processing. The ability of the government to collect and process information had increased dramatically and expanded in other disciplines, including architecture and the planning of the built environment, as we will examine in more detail in the next part of the thesis\textsuperscript{248}.

For some historians, the period between the second half of the nineteenth century and the mid twentieth century denotes "an information revolution in which society began to manipulate larger quantities of data for administration, business, and other purposes."\textsuperscript{249} The ability of the state bureaucracy to collect and process information as well as develop informational and communicational technology was proved crucial during the second world war and it contributed significantly to the development of the welfare state. The information regarding the condition of the British population after the war in terms of health, employment, wealth, housing and education, helped to support the proposals that William Beveridge put forward in the Social Insurance and Allied Services report of 1942. In fact, the data informed the series of white papers that the government composed outlining

\textsuperscript{247} Ibid., 308.

\textsuperscript{248} For the ways that the advent of information technologies and computers influenced the architectural research and education see in the next part The architecture of science at Cambridge University and the educational-industrial complex.

the main welfare policies to be presented to the Parliament and helped convince any opposing parties. The policies introduced by the National Insurance Act of 1946 and the National Health Service Act relied on the composition and maintenance of very large records, which included information on the specific characteristics of each individual and allowed the state officials to recognize existing patterns and habits within the population as well as to calculate tendencies and make future provisions. As Foucault writes: “The population is not, a collection of juridical subjects in an individual or collective relationship with a sovereign will. It is a set of elements in which we can note constants and regularities even in accidents, in which we can identify the universal of desire regularly producing the benefit of all, and with regard to which we can identify a number of modifiable variables on which it depends.”\(^{250}\) This way, the practice of government and administration of the welfare state could rely on systematic classifications and calculations for the management of population and its attributes, yielding explicit biopolitical strategies.

The physical centre of the British government and civil service has evolved through the years at Whitehall district in central London. It develops around Whitehall road that links the Charing Cross site and the Trafalgar Square to Parliament Square and the Houses of Parliament, Downing Street branching out of Whitehall road. The name of Whitehall originates from the Palace of the White Hall that occupied the area between the river Thames and St. James Park and was destroyed by fire in 1698. After the destruction of the palace, Whitehall road was widened and the only part that remains of the old palace is the adjacent Banqueting House by Inigo Jones. As the sovereign and administrative powers of government started to separate by the late seventeenth century, most of the state’s services found accommodation within or around Whitehall. The majority of the buildings in Whitehall area were built between the late seventeenth and nineteenth century, in order to house the new institutions of the state (Fig.3.1). These are buildings that serve military purposes, government buildings that house the ministries, the headquarters of the police as well as the treasury buildings.\(^{252}\)


\(^{251}\) The most important of those buildings are demarcated on the map prepared by L. Martin for his Whitehall plan report in 1965. An analytic description of the area can be found in the appendix.

\(^{252}\) See in Fig.3.1 Whitehall map and description of buildings in the area.
Most of these buildings took up Neoclassical articulations. Kenneth Frampton explains that “the evolution of Neoclassicism was largely inseparable from the need to accommodate the new institutions of bourgeois society and to represent the emergence of the new (republican) state”. One could add that Neoclassicism was employed to communicate the civil character of these institutions and reflect the continuation of history, but in a rational way that avoided the splendor and excesses of absolutist past.

The emergence of the office as a new building type from the Renaissance onwards and the organization of a distinct administration centre in a single building to accommodate the new bureaucratic institutions, do demonstrate the rising importance of the executive aspects of government and reflect its effect on the formal realm of the city. One of the earliest examples of office architecture is the Uffizi in Florence, which was built between 1560-1581. The building initially hosted the magistrates that oversaw the Florentine production and trade as well as the administrative offices and workshops of the Grand Duchy. The offices that were adjacent to the Palazzo di Medici were built by the banking family of the Medici. Another early example of an office building is the Bank of England that was initiated a century later and aimed to accommodate the administrative and economic proceedings of the state. Both of these early examples of office architecture emerge through the banking and trading activities of the market and the attempts of the state to facilitate and oversee them. Office architecture will come to accommodate a diversity of bureaucratic institutions, private and public ones. The typology of the office evolves through the years as the organizational theories and practices of these institutions change from the carefully, but often labyrinthine division and arrangement of space by permanent walls in individual offices in the nineteenth century that allows for privacy and a hierarchical designation to the Taylorist open plans of the twentieth century that resembles the factory production line and facilitates the allocation and repetition of tasks, the uninterrupted work supervision and flexibility according to changing work requirements.

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As the British state evolved and its bureaucratic structures developed, so did the physical occupation of spaces in Whitehall area that formed a large assemblage of office buildings and created an administrative network within the centre of the British capital. These offices, administrative and ministerial buildings adjusted in their form to the governmental and administrative needs and approaches of each period, often reflecting the ways that the British government was formed, functioned, but also related to the public and the city. In the past four centuries, Whitehall became the speculative site of many building schemes. An article in R.I.B.A. Journal published in April 1980, was characteristically entitled Whitehall Farce\textsuperscript{254} in order to emphasize the record of the uncompleted plans initiated by the British state in the area. Amongst them, there have been four notable design proposals\textsuperscript{255}. The first one was by Inigo Jones and John Webb in the 1630s and 1640s (Fig.3.2). Christopher Wren almost forty years later (1669-85) also suggested building over Whitehall (Fig.3.3). Another significant plan was Charles Barry’s General Scheme for Metropolitan Improvements (Fig.3.4) that was exhibited in 1857. The plan rethought the overall area between the Trafalgar Square and Lambeth Bridge and proposed the unification of all the government offices in ‘one connected mass of building’. The County of London Plan\textsuperscript{256} of 1943 (Fig.3.5) contained a significant proposal for the development of Whitehall in the postwar period. It was put together for the London County Council by Patrick Abercrombie and John Henry Forshaw and although its scope was more expanded and regarded an overall plan for London, it nevertheless presented a clear vision for the area. The scheme involved knocking down or moving to another site three major buildings\textsuperscript{257} in order to open up space. It acknowledged the traffic congestion problem and introduced the idea of a tunnel from Charing Cross to some point.


\textsuperscript{255} These are the four proposals that Leslie Martin and his colleagues outline in their 1965 report. Martin, Leslie, Whitehall plan: a plan for the national and government centre, (London: H.M.S.O., 1965), 31-32.

\textsuperscript{256} The plan was presented amongst other plans that were debating London’s future after the war (notably the M.A.R.S. group plan of 1942 and the R.I.B.A. plan of 1943). Abercrombie and Forshaw diagnosed five key defects of the city: the traffic congestion, the depressed housing, inadequate and bad distribution of open spaces, the expanding suburban sprawl and the mix of housing and industrial uses of the land.

\textsuperscript{257} These were the Institution of Mechanical Engineers and Civil Engineers, the Royal Institution of Chartered surveyors and the County of Middlesex offices.
west of Victoria. This way, the scheme aspired to establish a pedestrian traffic free precinct around Whitehall area (Fig.3.6). Moreover, the report was concerned with the lack of space in Whitehall and the gradual overflow of the government departments out of it and proposed a compact government centre spanning from Trafalgar Square to Tate Gallery and from St. James Park to the river (Fig.3.7). All the proposed plans, in one or another way, follow the tradition of total design in the form of a superblock that facilitates the expansion of this endless network of offices within the city. They are architectural compositions that exceed the size of a traditional city block. These are plans that propose large-scale investments by public (and in some cases private) organizations. Alan Colquhoun in his analysis on the emergence of the superblock form highlights the fact that it is the liberal capitalist city that allows this breakup of the city fabric into large discrete lumps unified under the control of one authority; in this case, the British state[^258]. The proposed government centres through their concentrated and unified forms reflect the accumulation of authority, the systematized formalization of the bureaucratic and administrative processes of the state. Most importantly, one cannot avoid but to notice that all the proposed architectural plans for Whitehall had been articulated at specific points in history when the forms and practices of government were at the threshold of a change. The first two proposals are prepared during the transition of the British monarchy from absolute to constitutional when the act of government splits from the absolute sovereign power to constitute the executive institutions of the state. The third proposal is drafted at the time when the state institutions are changing from traditional to modern bureaucratic structures. The last proposal that existed within the County of London plan of 1943 was prepared during the wartime to initiate the city’s redevelopment after the war. It is a proposal that initiated during the formation of the post-war welfare state when counties were given the responsibility of the planning and building of their areas. The plan aimed to provide guidance and lay the principals for the orderly organization of the city as a coherent whole[^259].


[^259]: This was evident both by the clear functional zoning proposed, but also by the content of Chapter 12 that presents 'Architectural Control' as one of its themes. Forshaw, John Henry and Abercrombie, Patrick, The County of London Plan 1943.
set the example to other counties. It was a proposal within the spirit of postwar reconstruction and welfare consensus when the majority of the British political parties realized the importance of a centralized and powerful government for the social and economic planning of the postwar Britain.

The Whitehall plan for the creation of a new national and governmental centre that was prepared by Leslie Martin and his colleagues in 1965 that the thesis examines in the next part, follows this postwar legacy. It builds upon the proposals of The County of London Plan for the establishment of a pedestrian traffic free precinct in the area, even if this involved knocking down some of the existing buildings. The Whitehall plan also comes to address the needs and operations of a welfare state that was fully formed and kept expanding. In order to cover the needs in administration and office spaces, the Ministry of Public Buildings and Works had already started delegating to research groups the task of prototyping and standardizing offices. By 1962, the first proposals and pilot schemes were put forward to modernize the offices of the extensive bureaucratic network of the state. For this purpose, the examination of the Whitehall plan of 1965 is important, in order to investigate how the different operations of the welfare state required not only a new architectural form to host and represent them in the form of a government and national centre, but also a building scheme that would essentially materialize the changes that were taking place in the practices of the government of British population at the time. This way the research will be able to demonstrate how the welfare state constructed spaces that were performing and realizing a form of government rather than only representing it.

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260 Information acquired from Harwood, Elain, Space, Hope and Brutalism, 525.
Figure 3.1 – Plan of Whitehall area with the key buildings in 1964. The Whitehall Road and Parliament Street are the main roads connecting Trafalgar Square to Parliament Square, the Palace of Westminster, and the Westminster Abbey. The Great George Street connects the Parliament Square to St. James Park, while in parallel, Downing Street passes by the Foreign Office leading to the Richmond Terrace.
An architecture for the officialdom

Figure 3.2 – Proposal for building in Whitehall by Inigo Jones and John Webb, 1630 – 1640, which put forward the idea of the obliteration of Whitehall and older palaces and the development of a rectangular building set out in courts extending from St. James Park to the river.

Figure 3.3 – Christopher Wren’s proposal for building at Whitehall, 1669-85, put the Banqueting House at the centre of the development and proposed the creation of a great gallery that linked to a New House of Lords.

Figure 3.4 – Charles Barry’s General Scheme for Metropolitan Improvements in 1857, and considered a larger area and proposed that all government buildings should be connected into a large one.
Figure 3.5 – The County of London Plan of 1943 by Patrick Abercrombie and J.H. Forshaw.
Figure 3.6-Proposals for a government centre in the County of London Plan, 1943.
Figure 3.7- The proposed precinct in Whitehall and Westminster area as suggested by the 1943 County of London Plan.
3.2 The Whitehall government centre: a calculated plan for the modern welfare state.

By the 1960s, Britain had established a series of welfare policies that became integral part of the state’s operations. The post-war development of the welfare state and the previous extended warfare enterprises had grown significantly the size of the government administration and created an issue of space capacity within Whitehall. In parallel, the majority of the existing buildings within Whitehall dated back to the nineteenth century and could not accommodate the needs and operations of the modern state. It was in the labyrinthine corridors of the nineteenth century building of Foreign Office, reflecting the perplex and rigid structures of the traditional bureaucratic processes, that the plan for a new and modern government centre at Whitehall was born. The Foreign Office was housed in building designed by George Gilbert Scott in 1861 and was one of the government departments that showed an urgent need for space. On the 17th December 1963, a Commons debate demonstrated a cross party support for the Foreign Office demolition and redevelopment. In parallel, there was a growing support for the idea that the Foreign Office’s reconstruction had to be part of a wider scheme, one that would consider all the building projects in the area. In April 1964, after almost four years of discussions and negotiations between the different ministries and governmental departments, Leslie Martin was appointed “consultant architect to advise on the development of Whitehall area.”

The projects that were under consideration in Whitehall at the time, were the new offices for the Home Office in the area between the Richmond Terrace and the Palace of Westminster, the new Parliamentary building, the new building to house the Foreign Office/Commonwealth Relations Office after the demolition of the existing one, the new building for the Ministry of Public Buildings and Works in Broad Sanctuary and a new Royal Institute of Chartered Surveyors building. While the historic buildings in the area should be preserved (Banqueting House, Old Admiralty, part of Scotland Yard and Downing Street). NA PRO 12/725, note from W.O. Ulrich, 1 January 1964 retrieved from Sharr, Adam & Thornton, Stephen, Demolishing Whitehall, (Surrey: Ashgate, 2013).

The announcement was made by the Conservative Minister of Public Building and Works at the time (M.P.B.W.), Geoffrey Rippon. NA PRO 12/725, note from W.O. Ulrich, 1 January 1964. Initially, an architectural competition between young architects was suggested, but Rippon made use of a list of possible architects put together by the President of the R.I.B.A., Sir Robert Matthew. In that list Leslie Martin’s name was not included. Martin gradually raised as a dominant candidate within the department of the Ministry of Public Buildings and Works. Martin was well known and respected in the Ministry for his work at the Royal Festival Hall and his recent participation at the committee to elect an architect for the new British Library. In January 1964, there was an initial meeting with Martin in the M.P.B.W., but Martin rejected the job due to other engagements. After further persistence he agreed on the commission and suggested the appointment of Professor Buchanan
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Works (M.P.B.W.). This is the ministry that through the centuries was responsible for the government building projects and that initiated the construction of most of the buildings at Whitehall. It was established in 1378 as Office of Works and named Ministry of Works and Buildings in 1940, playing a significant role in the reconstruction of Britain after the war and the development of regional and local offices that planned and built the main infrastructure of the welfare state.

The area under consideration was the one around Parliament Square, Bridge Street and Whitehall. The proposed plan had to consider the rebuilding of the Foreign Office, the redevelopment of the Richmond Terrace / Bridge Street site for the accommodation of a new Parliament building and government offices, the relationship of the new Parliamentary building to the existing precincts, the development of other buildings in the area such as the new government conference centre and the rebuilding of the headquarters of the professional institutions. For the preparation of the plan, Martin put together a team of Cambridge graduates to help him. The team included Jeremy Taylor, a Cambridge Ph.D. graduate, David Lea, a recent architecture undergraduate and Lionel March, who after graduating from Cambridge and collaborating with Martin in his design studio, had left for the USA, where he conducted his research on the mathematics of the architectural form at the Harvard/M.I.T. Joint Centre for Urban Studies.

In July 1965, Whitehall: A Plan for the National and Government Centre accompanied by a report on traffic, was published by Leslie Martin and Colin Buchanan (Fig. 3.8). Between the appointment of Leslie Martin in April 1964 and the publication of the report, over a year later, elections had taken place. Harold Wilson succeeded Alec Douglas-Home to form the first Labour government after thirteen years and Charles Pannell replaced Geoffrey Rippon as Minister of Public

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264 Sharr, Adam & Thornton, Stephen, Demolishing W hitehall, 77.

265 Lionel March had turned from mathematics to architecture and was one of the first people in Britain to experiment with the application of computer in architectural research.
Buildings and Works\textsuperscript{266}. Among disputes and the severe financial problems of the time the project was eventually put on hold. It was not till 1970 that the public inquiry for the implementation of the first stage started. Meanwhile, the Victorian Society had succeeded to persuading the government to list the Foreign Office and Martin's project was split in three stages and several commissions to different architects. Martin's plan gradually dissolved into the bureaucratic perplexing machine from where it had emerged. Nevertheless, it remains a telling document of its time and a characteristic example of the relationships between architectural design and government policies in the late 1960s Britain.

![Figure 3.8 - The Whitehall plan report published in 1965 by Leslie Martin.](image)

The report is structured in four successive parts that present the development of the plan from its objectives to its final proposal (Fig.3.9). The “basis of the plan”

\textsuperscript{266} Rippon accepted Martin’s report in July 1965 “as a broader framework within which future development should take place”. Whitehall Farce, R.I.B.A. Journal, April 1980, 55. Although, Pannell did support Martin’s plan to his communication with Wilson and the Cabinet deputation that took place later in July 1965, he eventually failed to win the Cabinet’s support. In the new Wilson government, the Ministry of Public Building and Works had lost great part of its authority to the Ministry of Housing and Local Government and the report raised a series of disputes between the different ministries on the nature and the priorities of the project. The newly formed Greater London Council, the Civil Trust and the Victorian Society wanted to take part on the decisions. Information from Sharr, Adam & Thornton, Stephen, Demolishing Whitehall, (Surrey: Ashgate, 2013).
The Whitehall government centre draws the objectives of the plan, the “components of the plan”, collect and analyze the available information developing the design logic. In the “assembly of the plan”, the constituent elements of the plan come together, and the plan takes its final form that is presented in the last part, “the plan presented”. Building on Abercrombie and Fors's recommendations of 1943, the Whitehall plan proposed the development of a government and national centre around Whitehall and the establishment of a traffic free pedestrian precinct around the Parliament square. Leslie Martin’s proposal envisaged a comprehensive solution for the area that could be realized in eight separate and independent stages. Every stage was thought in relation to the previous and consequent one and there was a provision for a methodical deployment of the overall plan in time.

Figure 3.9 - The structure of the report shows the metrological development of the plan, starting from the research, moving to the design logic and the final presentation of the proposal.
The project initiates with the construction of a new Parliamentary building of a distinctive and recognizable character at the Bridge site, opposite to the Houses of Parliament. The building would be raised on a podium to align with the Houses of Parliament and connect to it through a subway (Stage 1) (Fig.3.10). The rest of the Bridge site would be used for the construction of a new government office building (Stage 2)\(^ {267}\) (Fig.3.11) dominated by an east-west gallery and a self-contained public concourse on the ground level, parallel to which, an external pedestrian way from St. James's Park to the river would be established. This way, a first area dedicated to the public is created. The gallery line generates all the governmental departments and allows the connection between them. On the ground level, the gallery forms a foyer for the underground station that opens up to the external street, connecting the scheme to the city fabric and opening the centre to the public. The foyer would take the form of a covered shopping area between the Victoria Embankment and Parliament Street, forming a second public area (Fig.3.12). On the first-floor level, the gallery would become office space and secondary galleries would be formed on the north-south direction. Conference rooms, stores, and other facilities are to be clustered around vertical circulation points, allowing for easy access to these common spaces. The gallery and the extensions would have a stepping ziggurat like silhouette, in order to allow for a better exposure to sunlight, more space on the ground floor and avoid building a rigid wall effect on the facades, while the height is limited to eight storeys for the same reason (Fig.3.13). The different departments are arranged around grassed and planted courtyards that would provide a pleasant outlook for the offices. The terraces would also be paved and planted, available for recreational purposes to the office workers and government officers, encouraging social activities.

\(^ {267}\) The old Scotland Yard building by Richard Norman Shaw would be accommodated in this development.
Figure 3.10 – Stage 1: The new Parliament building (1.1) is constructed, which would be of distinguishable character and associated with the Parliament. At the same time, the underground station is removed and incorporated in a new shopping concourse (3.1) that links Parliament Street to the riverside (Victoria Embankment).
Fig. 3.11 – Stage 2: There is a full development of Bridge Street site. The public concourse with government offices over, extends (3.2). The new government office building is initiated with a further development at Richmond Terrace site (2.1). The government offices are planned around courts, while the building create a new façade to Parliament Street.
Figure 3.12 – The main gallery of the Bridge Street development ends to the river. There is an entrance to the building and the public concourse, a lower entrance to the underground, while the East-West gallery runs parallel to the public way to St. James Park.

Figure 3.13 – A principal gallery along which groups of rooms are arranged. The stepped wall responds to daylighting factors giving a ziggurat form to government offices. Although the report does not specify where this section is taken, one can assume that it corresponds to a cross-section that is perpendicular to the long axis of the main (east-west) gallery.
After the development of the Bridge site, the report recommends the development of the Foreign Office (Stage 3) (Fig.3.14) and the Great George Street sites (Stage 4) (Fig.3.15). These could be separate building operations. In this stage, the established east-west gallery of the Bridge street site extends on a higher level across Whitehall to the Great George Street site. Sub-galleries cross the main gallery and lead to different departments. This allows for the division and arrangement of government offices according to their specialization and the deployment of a large network of office departments. The report suggests that one of these sub-galleries could connect Downing Street to the new conference building planned on the west side of the Parliament square. This route could contain meeting rooms along its way, providing connectivity between the governmental departments and the offices of the Prime Minister (Fig.3.16). On the Bridge site, the offices are arranged around these sub-galleries and formulate stepped courtyards, while the facades of the buildings on the Parliament Street develop in a similar way to the building on Bridge street, forming a welcoming gateway to Parliament Square (Fig.3.17).
Figure 3.14-Stage 3: Government offices are built to replace the Foreign Office. The site can be developed independently, but the arrangement of offices around courtyards and the employment of similar design principals establishes a consistency in form.
Figure 3.15: Stage 4: The expansion of government offices with the development of the Great George site and the extension of the East-West gallery starts forming a network of office buildings. The gallery connects the different departments as well as the underground station to St. James park.
The development of the buildings was based on circulation and connectivity. At the typical office wind (left), offices are organized around vertical circulation spaces and common facilities. Secondary links of offices between the wings are formed creating porte cochères across the side entrance.

The facades of the buildings creating a welcoming gateway to Parliament Square and sheltered sidewalks along Parliament Street. The section is taken at the entrance to Whitehall, at the crossroad of Parliament Street with Downing Street and Richmond Terrace. The red outline shows the width of Parliament Street and the height of the existing buildings.
As soon as the construction of the new government building offices is concluded, the plan puts forward the establishment of the enclosure of Parliament square (Stage 5) that would provide abundance of public space in the heart of the government centre. This is achieved by eliminating the clutter caused by traffic with the building of a riverside underground tunnel that directs the traffic from Embankment to the Victoria Tower gardens avoiding the Parliament square. The redistribution of traffic on the west side of the square improves further this result. Thus, a precinct is created around the Parliament square and a new surface layout can replace the roads, giving the space that has been gained in public use through the expansion of the square. Moreover, there is a significant gain of space on the river side, in front of the Victoria gardens, the Victoria Embankment and the Houses of Parliament terraces. This allows for the abutment of the Westminster bridge to extend on the Victoria Embankment in order to form a causeway and provides space for the extension of the main gallery towards the river (Stage 6). There, a series of cafes and restaurants are to be accommodated. At a lower level, an uninterrupted riverside promenade is created, and a Westminster pier is built to be enjoyed by the pedestrians (Fig.3.18). Through these actions, the space for public use is increased significantly and the Whitehall area becomes more open to the people.
Figure 3.18- Stages 5 & 6: The extension of the gallery towards the river, the development of riverside terraces and the formation of a promenade, create a pleasant public environment. Important gains of open space are made, and the formation of a precinct begins.

On the west side of the Parliament square, on the Broad Sanctuary area, the construction of a building of national and international significance is proposed (Stage 7) (Fig.40). The building would serve as conference and reception centre and provide public areas (viewing platforms and terraces) to the visitors, announcing Whitehall as a place open for discussion and the exchange of ideas. For this to be possible, the demolition of the majority of the existing buildings is recommended. The conference centre, together with the new Parliamentary building were meant to be of exceptional architectural character, becoming the contemporary monuments that would accompany the existing ones of the Houses of Parliament, the Westminster Abbey, St. Margaret’s church and the Central hall. Finally, a line of housing for the MPs at the Smith square area is to be developed (Stage 8) (Fig.3.19), creating a southern wall to the precinct and concluding the enclosure of Whitehall area (Fig.3.20). Thus, a traffic free precinct
The Whitehall government centre

around the Parliament square is formed and a modern megastructure that would house the new government and national centre emerges, replacing the old fragmented fabric of Whitehall.

Figure 3.19 - Stage 7 & 8: The national conference centre, a major building of national or international significance on the east and the housing development for the MPs (5.1, 5.2, 5.3) on the south side are built and define the final boundaries of the precinct. The precinct allows for plenty of gains in open space and the creation of a clearly defined public space.
Figure 3.20 – The borders of the proposed precinct at Whitehall area, which is formed by the government offices on the north (right), the residential blocks on the south (left) and the national conference centre on the east (top).

The clear sense of enclosure and the establishment of a pedestrian precinct create a topological centre²⁶⁸ for the governmental and political authority within the city. The demolition of the majority of the existing architectural fabric in Whitehall that the plan assumes, creates the necessary space that according to the historian of modern architecture Siegfried Giedion²⁶⁹ in a text written in collaboration with Josep Lluís Sert and Fernand Léger in 1943 on the Nine points on a New Monumentality, a monumental architecture requires in order to make its appearance (Fig.3.21). This way, the parliamentary precinct brings into a new

²⁶⁸ The position of the government centre was thought in relation to the Charing Cross area and the demolition of the Covent Garden market, where a cultural and commercial centre was to develop and the axis that linked the Parliament square to Tate Britain, South Bank, the British Museum and the new British Library.

relationship the existing (preserved as single objects) and the proposed buildings in the area and sets a clear hierarchy between them. The Palace of Westminster and the Westminster Abbey dominate the area, the new Parliamentary building and the new conference centre emerge as contemporary monuments, while the new government buildings stay in the background. The report underlines that “this typical form of the government offices will contrast with the specialized form of the Parliamentary building and emphasize its special position and function in the layout”\(^{270}\). This way, the plan distinguishes between the political and governmental authority within Whitehall. It points to the importance of the Parliament as the space of political decisions, while the governmental offices exist in the background as ordinary office spaces for executive actions that are considered of less political significance (Fig.3.22), even if they are the actual spaces in which political decisions and governmental plans are implemented.

Figures 3.21 & 3.22 - The final form of the new national government centre at Whitehall, with the obvious architectural distinction between the governmental buildings and the buildings of political authority. The centre unfolds as an extensive network of buildings.
I would like to propose that the Whitehall plan has a twofold existence; On one hand, it attempts to reflect in its form, the idea of the modern welfare state. On the other hand, it clearly incorporates in its design process, the rationality, calculable logic and scientific techniques that altered the architectural practice in the late twentieth century. As we will see, the Whitehall plan is a project that stands historically between two realms; those of the post-war welfare state and that of the practices formed by technocratic rationalities that started prevailing British governmental practices in the 1960s. The project also stands at the very core of Leslie Martin’s professional career that begins with the constructivist ideas for the merging of arts and sciences in the service of society, as manifested in the unique issue of the 1937, Circle magazine\textsuperscript{271} (Fig.3.23), passes to the application of the modernist ideas in public architecture that he produced for the London County Council\textsuperscript{272} in the 1950s (Fig.3.24) and concludes at the formal investigations that relate land and use that Martin carried at the Centre of Land Use and Building Form Studies\textsuperscript{273} in Cambridge supported by public and private sponsorship since the mid-1960s.

\textsuperscript{271} \textsuperscript{271} Circle: International Survey on Constructivist Art was published in 1937 and was edited by Leslie Martin, artist Ben Nicholson and sculptor Naum Gabo. It included contributions by Piet Mondrian, Henry Moore, Le Corbusier, Walter Gropius, Siegfried Giedion, Lewis Mumford and Laslo Moholy-Nagy.

\textsuperscript{272} \textsuperscript{272} In 1953 Leslie Martin was the Chief Architect at L.C.C. that he joined after the war.

\textsuperscript{273} \textsuperscript{273} The Centre of Land Use and Building Form Studies was established in 1967 in Cambridge by Leslie Martin and was dedicated to the research of land use and form. After Martin left, the Centre was directed by Lionel March.
Figure 3.23 – The Circle Journal, published in 1937 was edited by Leslie Marin, Ben Nicholson and Naum Gabo the constructivist ideas for the merging of arts and sciences in the service of society.

Figure 3.24 – The Royal Festival Hall, built in 1951 for the Festival of Britain was designed by the L.C.C. architecture department under the supervision of Leslie Martin.
The Whitehall building plan reflects both in its concept and proposed architecture, the intention to construct a government and political centre for the modern welfare state. This is evident through a series of observations beyond the fact that the project was initiated by the welfare state to accommodate its expanding functions and host its operations. The rationalization of the proposed form and the concentration of all the departments in one place, are all elements that manage to produce a cohesive and unified image of a modern state that is rational and organized. Most importantly though is the obvious effort to increase the public space and create a better environment for the public, the civil officers and the politicians, which denotes a democratic state and foregrounds the welfare of its people. As Charles Pannell underlined, Leslie Martin’s plan had the potential to “raise a hope of better times and more spacious days”\(^\text{274}\).

In his analysis of the most known building by Martin, the Royal Festival Hall, Adrian Forty draws on Thomas H. Marshall’s idea that the welfare state relied merely on the equality of status rather than on the equality of income. The impossibility of the welfare state to radically redistribute wealth and provide an economic equality, was compensated by administering access to social services and by putting forward an ideology of a welfare that relied on the equality of the social rather than economic status\(^\text{275}\). Forty emphasizes the ability of some architecture to create spaces that allow for this perception of equal social status to be formed, by giving the opportunity to the individual subject to “enjoy the illusion of his or her own equal social worth”\(^\text{276}\). In these terms, the Royal Festival Hall (Fig.3.24) is in Forty’s opinion, the perfect example of the welfare state building because, “the owner of the building is none other than the subject. The volume is yours and yours alone. Of course, exactly the same experience occurs for everyone else who enters the building, and so the result is the sense of an equal right to the possession of the building, and an absence of any commanding

\(^{274}\) Letter from Charles Pannell to Harold Wilson in July 1965. Published in Sharr, Adam & Thornton, Stephen, Demolishing Whitehall, 56.

\(^{275}\) This is a criticism to the welfare state from people who expected more radical changes in the economic structure of the British society. For other analysts, the welfare policies actually did achieve an important redistribution of the wealth and more equal economic possibilities. While, for the neoliberal criticism is that this was in reality an unfair and imposed equality that limited people to realize their full potentials as it imposed a specific social and economic structure.

authority. This attempt to create through architecture a perception and an ideology of “equal social worth”, is what, reappears in the Whitehall plan. This becomes evident in the way the proposed government and political centre conducts its relations to the public. The treatment of the building’s elevations and open spaces as well as the establishment of a public gallery in the core of the complex are some of the aspects in the design of the new government centre that insinuate this attempt.

The suggested stepped elevations that avoids a walled rigid face on the surrounding streets and blur the strict delimitation of the complex, allowing the extension of one’s visual perspective of the streets. The combination of these facades with the courtyard plan produces a landscape effect that is enhanced by the relatively low building heights, and permits the visual access to the government buildings, while it promotes a sense of community. Although, Martin denies the monumentalization of the facades by breaking them, in the interior public spaces, he provides the “scale and dignity once thought necessary for public buildings”. The project carries the characteristics of an architecture produced for the public that contribute to the constitution of what Cornelius Castoriadis called the symbolic in the imaginary institution of society. An architecture that operating on the level of the symbolic allows for the self-institution of society through the function of the imaginary. The government centre gives the impression of a state that provides for the well-being of the citizens. A “satisfactory public environment” is created by removing the clutter of the traffic, reconfiguring the surface of the Parliament square and giving access and generous spaces to public gardens and terraces. The flow of the pedestrian’s movement becomes uninterrupted and open spaces along the river allow for a river side promenade to be enjoyed by the people. In parallel though, the accommodation of a shopping centre within the governmental complex and the

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277 Ibid.

278 This brings in mind both the Brunswick Centre’s facades on which Patrick Hodgkinson initially worked with Leslie Martin, as well as Denys Lasdun’s work for the Institute of Education and the University of East Anglia.


provision for cafes and restaurants in the area, reflect the increased affluence of the British people and foresee the new direction in public architecture that addresses the citizens, as economic agents and consumers of services, undermining the initial intention for a space of equal social worth that is accessible to all. The government centre is also a centre for leisure, recreation and consumption.

In addition, the plan proposes an east-west gallery that passes through the government buildings and links St. James Park to the river. The gallery recalls the spaciousness of Galleria Vittorio Emmanuelle II in Milan and implements the public element in the very core of the governmental complex. The plan allows for the insertion of a public space within the government complex; officials and public are to share the gallery space on the ground floor as equal citizens of the state. The public is acknowledged as having a right of access within the government centre. Thus, the proposal addresses the subject as a social citizen that carries rights within the space of government and register their physical presence within it. This way, the public is symbolically recognized as a constitutive component of the British government and the citizen is considered as a subject of equal social worth to the government officials and politicians. At the higher levels, though, the building becomes exclusive to governmental office use, denouncing a clear separation of public and governmental realms (Fig.3.25 & Fig.3.26). This way, the government centre retains distinct hierarchies of spaces and provides a sheltered environment for the bureaucratic and political structure. This is a self-contained environment; all the government offices are concentrated on the same site, creating a sense of totality and enclosure that is further enhanced by the visual unity of the buildings. The different departments create a coherent system that is structured by its interconnected parts forming a large bureaucratic network. This is something reflected on the building’s arrangement and form. It is an interiorized environment that appears expandable, but autonomous from the exterior and the rest of the city. One could imagine that this system can extend within the city without an end. This is a built

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282 According to Whitehall report, the public right of way to the river goes back to the old Whitehall Palace and the Privy and Great Stone Galleries that passed through the palace’s buildings.
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celebration of the state’s bureaucratic machine. The complex is also a structure of great size. It develops in four building blocks. It is what Alan Colquhoun has named as superblock and it cannot but bring into mind the other utopian megastructures of the 1960s. It is in 1964 after all, the year that the Whitehall plan was under preparation, that Reyner Banham calls a ‘mega year’, because of the plethora of megastructures that made their appearance that year. It is a self-contained governmental megastructure what Martin puts forward. One that attempts to impose order into the bureaucratic chaos of the old Whitehall, and although, it does recognize the equal worth of all the citizens, in reality it transcends it by forming a bureaucratic megastructure that operates beyond the citizens (having though incorporated them). In a way, one could note that this is suggestive of the political and governmental practices that operate above and beyond the architecture that accommodates them.

283 It was also the year that the word was used for first time by Fumihiko Maki. See Banham, Reyner, Megastructure: Urban Futures of the Recent Past, (London: Harper and Row, 1976).
There is also a strong rationalization in the proposed plan that becomes evident in different aspects of the design. The offices layout carries a diagrammatic clarity that corresponds to the rationalized planning of the services and the distribution of labour within the operations of the state. To support the complexity of the governmental bureaucratic machine, high technology was to be put into application. The automation of the interdepartmental communication was to be achieved through the mechanical distribution of documents, the linkage of computers for data exchange and the closed circuit

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284 Computers were introduced for first time in British civil service in 1963.
T.V. networks for the presentation of information. Moreover, the strategies of the heating/cooling and circulation services were resolved and rationalized in order to be optimized. All these services and networks were analyzed thoroughly and presented as a system of organization that was reflected on the buildings arrangement (Fig.3.27).

Figure 3.27 - Diagram of the services that informed the building form. A rationalized pattern of access points for all services related to final form.

Furthermore, the plan recommends office spaces that have the minimum subdivision to accommodate the maximum population possible and use the space in the most economical way. It excludes the traditional corridor plan that was popular in the British government offices in the past and provided high privacy, but a limited variety of internal arrangements and communication. The report doesn't specify if the open plan is going to take the form of a Taylorist open plan, of a Bürolandschaft or of a combination of the two as it was used in American and British corporate offices at the time. These forms of open plan space, based either on Taylor’s theories of industrial scientific management or on
Elton Mayo’s experiments on human working relations, aim to provide clerical space that is flexible in its use and allows the uninterrupted flow of work and communication to achieve the maximum efficiency. Indeed, later efforts to house departments of the civil service used landscaped working environments that promoted a flexible rather than a rigid arrangement and a horizontal rather than a vertical hierarchy. Martin notes in the report: “It becomes questionable in fact if buildings tailor-made to the needs of special departments should any longer be built [...] the overriding need is for buildings which are flexible in use and provide good and lasting standards of space, lighting, outlook etc.” Thus, the office plan here, takes the form of a well calculated neutrality, a sort of a typical plan that operates as “the graph paper to a mathematical form”. Its neutrality contains and records performances, events, flows, changes, accumulations, deductions, disappearances, mutations, fluctuations, failures, oscillations, deformations. The adoption of the open plan layout although, it allows for flexibility and adaptability, is not a random choice, but rather a calculated one. It is the outcome as we shall see, of a series of numerical investigations made by Martin and his colleagues.

These investigations are clearly presented by Martin and his team in their report. The report resembles a scientific report both in its content and format. It is structured based on the methodology, which is systematic and rational (Fig.49). The design methodology includes assumptions, developed based on clear objectives, accumulated and examined data and conclusions after thorough analysis and experimentation. This is a clearly scientific approach to a design problem. Following on this, the report begins with the presentation of the “basis of design”, where the existing conditioning factors and objectives are set.


288 As Lionel March recalls, the team had discussed the office plan with Frank Daffy that in his research related organizational structures to specific office layouts. Officials of the M.P.B.W. felt very enthusiastically about this and aimed to develop it further; for this purpose, they conducted visits to the HQ Krupp, Pirelli and Olivetti Information from Sharr, Adam and Thornton, Stephen, Demolishing Whitehall: Leslie Martin, Harold Wilson and the Architecture of White Heat, (Surrey: Ashgate, 2013).
The Whitehall government centre continues with the "components of the design", where all the data and design parameters are examined, analyzed and tested and concludes with the "assembly of the plan" where, the outcome of the previous analysis is presented as the solution to the given problem. This scientific attitude to the design process is also evident in the language and the illustrations used in the report. The words applied are those of "efficiency", "economy" and "systematic approach". The language appears neutral and all the remarks are presented in two hundred and nine bullet points. The key data are illustrated in tables and graphs while, the drawings take the form of rational diagrams. The report communicates this information in a clear and simple way, using black and white colors with red highlights, modern sans serif letter font and a legible layout. Further calculations, diagrams and a research file of the project exist and are kept at Lionel March's archive. The design process carries in all its expressions the sense of a scientific research.

The Whitehall plan is a well-calculated plan. It is a plan that is based on a scientific methodology that puts forward a design calculus in order to achieve efficiency, optimization and economy of design. This is evident by three elements of the design process. Firstly, by the fact that the different design parameters and accumulated data are measured, quantified and compared against specific standards in order to be scrutinized for their efficiency (function 1 of the design calculus). Secondly, by the fact that specific design parameters are chosen and correlated between them, creating a formula that calculates the optimum building layout (function 2 of the design calculus). The architectural form comes as the result of the optimization of this formula. Thirdly, by the fact that the plan creates a framework to control and contain any possible changes towards a specific final result. It adopts a methodological approach that scientifically analyzes all the parameters so that it can anticipate and accommodate the possible alternatives (function 3 of the design calculus).

At the second part of the report, named "components of the plan", the principles for the development of the government buildings are examined and the accommodation within Whitehall is thoroughly analyzed. After making certain assumptions for the development of the area, the design attempts to rationalize the use of space by measuring the existing capacities and defining the optimum

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289 Information taken from Sharr, Adam and Thornton, Stephen, Demolishing Whitehall, 79.
The Whitehall government centre

ones. Two questions are posed: "What is the present building capacity and how effectively does it meet present-day needs? What is the potential optimum capacity and what are the ranges of choice that may guide decisions?". In order to answer to these questions, a series of data is collected on the net areas, gross areas and the population of the different sites. This information is measured and analyzed in terms of their efficiency. Both the Foreign Office and the Great George Street sites are found significantly inefficient; the first covering less than half of its gross area and the second less than a quarter of it. Using the above information and applying a sixty per cent efficiency and the plot ratio measures, the plan defines the optimum capacities of its site and the available choices between them. Thus, the design problem is quantified, and the design options are made comparable (Fig. 3.28 - Table I). The initial measures of comparison are the percentage of efficiency, the plot ratio and the office population; these are all measures that reflect the optimization of the land use to maximize office capacity and increase human capital and labour. In this part of the design process, the government offices are understood in regard to these elements, as simple containers of office workers. However, as the report underlines this initial analysis can be arbitrary, as the measure of plot ratio can contain many unknowns. The report notes: "Clearly some other measures are necessary in deciding the optimum conditions for the development...They are measures which must bring together a number of factors...". Therefore, the choice of measures is stressed as an important element of the design process. In many ways, measures bring in the design process the factors that reflect design priorities.

The report designates five factors to be considered in the design process; the size of plot, the office depth, the floor to floor height (these two factors are related to the effect of daylight), the building size, the percentage of efficiency of the floor space and the population. Expressed in dimensions and percentages, these are all quantifiable and calculable factors. These factors correlated between them, create the formula that will calculate the optimum building layout. The relation of just three of the factors is summarized in a graph (Fig. 3.29 – Graph)

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291 Ibid. 49.
292 Ibid. 50-51.
293 Ibid. 50-51.
that is presented in the report. This relates site area, floor area, plot ratio and building population. "When all these factors are examined in their variables and in relation to each other (for instance by computer methods), a recognizable pattern emerges". This pattern shows buildings of eight stories height and 3:1 plot ratio that allow for significant populations gains, high efficiency and an agreeable office space with minimum subdivision. By relating these factors to the organizational patterns of the office’s operations and networks, a series of ideograms were prepared. When these results are brought together with the organizational elements of the main gallery, the courtyards, the diagram of services and the standard unit of administration, a series of ideograms can be drawn (Fig.3.30). These ideograms adapted to the specific sites are used to explore and define the optimal architectural form. Consequently, the architectural form is the result of a calculus that is based on a defined relation between predefined parameters. This creates a formula that can be managed and optimized. Through this formula and its methodological and calculated approach that is based on assumptions, principles, examinations, experimentations and measurements, the plan attempts to anticipate change. It aims to minimize and contain arbitrariness. Operating through the use of benchmarks, standards, formulas and thorough analysis, it produces a framework that can contain possible changes and in parallel control the final result. "Fundamentally, it is a question of assembling an overall framework to guide decisions and choices" notes Martin in the report. In that sense, the plan presents a calculus as its fundamental design tool. The calculative logic presented in Whitehall plan starts prevailing many architectural projects of the British welfare state from the late 1960s onwards. The use of a calculus establishes a logic in the practice, perception and use of architecture and it is directly linked to the adoption of a scientific thinking in the practices of the welfare state. For this reason, the thesis considers the Whitehall plan as both an attempt to promote the welfare provisions for the social citizens, and a calculated plan that is characteristic of the technisization and scientification of the welfare state. In the next part we are going to investigate how this relates to a similar tendency that appears in the practices and discourses of government at the time and how these calculative mentalities and operations have transformed the design process and production of welfare state architecture aligning them to those of neoliberal governance. First, though, we are going to consider what constitutes a calculus and the ways
it functions within a project such as the Whitehall plan, activating it as an apparatus. As we will see the principal definitions of calculus correspond to the three functions of the design calculus above.

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**TABLE I**

<table>
<thead>
<tr>
<th>Site</th>
<th>Net clerical sq ft</th>
<th>Population</th>
<th>Net clerical area at 60% efficiency</th>
<th>As developed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2:1</td>
<td>3:1</td>
</tr>
<tr>
<td>A</td>
<td>260000</td>
<td>1880</td>
<td>252 000 435 000 584 000</td>
<td>2 440</td>
</tr>
<tr>
<td>B</td>
<td>315000</td>
<td>1980</td>
<td>314 000 471 000 628 000</td>
<td>2 600</td>
</tr>
<tr>
<td>C</td>
<td>Only limited Government use</td>
<td>302 000 452 000 603 000</td>
<td>2 510</td>
<td>3 770</td>
</tr>
<tr>
<td>D</td>
<td>232500</td>
<td>2060</td>
<td>245 000 368 000 490 000</td>
<td>2 000</td>
</tr>
<tr>
<td>E</td>
<td>464000</td>
<td>4070</td>
<td>484 000 725 000 968 000</td>
<td>4 000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9 890</td>
<td>13 560</td>
</tr>
</tbody>
</table>

**TABLE II**

<table>
<thead>
<tr>
<th>Site</th>
<th>Net clerical sq ft</th>
<th>Population</th>
<th>Net clerical sq ft</th>
<th>Population</th>
<th>Net clerical average sq ft</th>
<th>Plot ratio 3:1</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>290000</td>
<td>1880</td>
<td>435 000</td>
<td>3 630</td>
<td>462 000</td>
<td>3 700–4 000</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>315000</td>
<td>1980</td>
<td>471 000</td>
<td>3 900</td>
<td>522 000</td>
<td>4 200–4 500</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td>452 000</td>
<td>3 770</td>
<td>396 000</td>
<td>3 300 – space for Parliamentary building</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>232500</td>
<td>2060</td>
<td>368 000</td>
<td>3 900</td>
<td>390 000</td>
<td>3 000–3 500</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>454000</td>
<td>4070</td>
<td>725 000</td>
<td>4 000</td>
<td>810 000</td>
<td>6 500–7 000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 271500</td>
<td>5990</td>
<td>2 451 000</td>
<td>20 300</td>
<td>2 580 000</td>
<td>20 700–22 300</td>
<td></td>
</tr>
</tbody>
</table>

Add for sites unaffected by building: 660 000 4 800 660 000 4 800 660 000 4 800 4 800–4 800

Totals: 1 931 500 14 790 3 111 000 25 100 3 240 000 25 500–27 100

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Figure 3.28 - Quantitative analysis of the existing and optimal office spaces at the different sites, depending on area, population and efficiency ratio.
Figure 3.29- Graph relating typical site areas and plot ratio, yielding possible gross floor areas, which then related to efficiency factors, yield possible net clerical areas. The net clerical areas, when related to densities of people can provide results about the population and efficiency percentage. The interrelation of these parameters leads to the optimization of the Whitehall government offices layout.
Figure 3.30 - Ideograms for the development of the government buildings form according to calculations. The layouts follow the principle of open courts of the existing buildings but vary both on their size and shape. They investigate the possible layouts according to the height and density of the buildings following the design calculus.
3.3 The architectural calculus (of the Whitehall plan).

At the beginning of chapter two (2.1), the thesis traced a genealogy of governmental practices and rationalities that carried a calculative logic. In this part, the thesis will dwell briefly on the mathematical and philosophical definitions of calculus in order to draw a parallel between government and architecture and reflect on the interconnections and effects that these calculative practices create between these two fields. These definitions are employed in the analysis of the calculative processes that were developed in the Whitehall plan in order to explain how calculations both mathematical and governmental, are implicated in the formation of the plan as an apparatus of governance and define the ways that the proposed architecture inscribes the subject.

The word calculus derives from the Latin word *calx* or the Greek κάχληκας, a gravel in English or a small stone used for counting. An initial definition of the calculus would be that of counting, which most often involves the act of measuring and results in quantification (definition 1). The assignment of a number through counting, to objects, events, or phenomena turns the qualitative characteristics of an object, event, person, etc. into quantifiable ones and makes it possible to measure and compare them against standards and expectations. The choice of a measure or of a standard of comparison entails a decision or an agreement to be made. This decision or agreement is explicit of the historical and political context in which it has taken place. Measures and standards carry a political significance regarding who decides on the adoption of the measure and the implications that the appropriation of this measure might have on different practices. Often this decision or agreement unveils conceptions of what is considered normal or ideal.

These small stones were later replaced by stones of various sizes that represented different orders of units. Thus, the first counting board, the abacus was produced. Codex Madrid I, by Leonardo da Vinci in 1493, is considered to be the first mechanism designed for calculating purposes. In the 1614, John Napier introduced the logarithm, a method that could calculate complex arithmetical operations as multiplication, division and roots by means of addition and subtraction. He also invented several mechanical methods for simplifying multiplications, most notably a system of rods, best known as Napier’s bones. Thus, the use of numerical tables was introduced in order to save time and labour in calculations. Some years later, in 1623 Wilhelm Schickard, created the Rechenuhr, the first calculating machine and in 1645, Pascal, built the Pascaline, the first digital calculator and ancestor of the contemporary ones. Stepped Reckoner was built by Leibniz in 1694 and is considered together with Pascaline, the originators of the computer that opened the path for the creation of Analytical Engine by Charles Babbage in 1821, the first digitally programmable computers ever designed.
The architectural calculus (of the Whitehall plan)

Georges Canguilhem in his book on The Normal and the Pathological\textsuperscript{295}, explains the notion of the normal in two ways: one that conceives normal from a quantitative point of view, characterizing as abnormal anything that stands outside certain statistically defined limits and another one that understands normal as an ideal state that can come to be a prototype. This way, the calculus through the act of quantification and measurement can set the requirements of what to be considered normal or ideal in general and in architecture specifically. Returning to our initial analysis of the design calculus of the Whitehall plan, this definition of the calculus clearly corresponds to its first function (1), which measures, quantifies data, and compares them against standards of efficiency.

This ability of the calculus to transform information to mathematical objects is a particularly important one. The calculus, in order to operate, converts objects and information into a form of abstract signs. By doing so, it bares them from their qualitative characteristics and makes possible their manipulation through common rules. Alfred North Whitehead in the Treatise on Universal Algebra defines calculus as "the art of the manipulation of substitutive signs according to fixed rules, and of the deduction therefrom of true propositions."\textsuperscript{296} Here Whitehead refers to the substitutive sign in relation to the expressive and the suggestive one, as this "that in thought it takes the place of that for which it is substituted...The signs of a mathematical calculus are substitutive signs."\textsuperscript{297} "In order that reasoning to be conducted by means of substitutive signs, it is necessary that rules be given for the manipulation of the signs."\textsuperscript{298} Therefore, the calculus can be defined as a deliberate process through a system of rules that employs signs and grants distinct results (definition 2). Of course, a system is always exclusive because, in order to constitute itself, it selects specific elements and omits others. So, when architecture is designed through the application of calculus and becomes a system that can be managed according to specific rules, it is important to investigate the nature of that system, the objectives of its manipulations as well as what has been included or not in it. Considering the design calculus of the Whitehall plan, the above definition, explains how specific

\textsuperscript{296} Whitehead, Alfred North, Treatise on Universal Algebra, (Cambridge: The University Press, 1898), Book I, Chapter I, 3-4.
\textsuperscript{297} Ibid.
\textsuperscript{298} Ibid.
parameters are chosen and interrelated, in order to create a formula that through the imposition of specific rules calculates the optimum building layout (function 2).

In mathematics, most importantly, the calculus refers to the study of change (definition 3). Invented by Gottfried Wilhelm Leibniz\(^{299}\) and Isaac Newton\(^{300}\) in the seventeenth century, the calculus (integral and differential) was developed from an existing study on indivisibles and infinitesimals created by Bonaventura Cavalieri and Pierre de Fermat, while its origins can be traced to Archimedes The Method \(^{301}\). The calculus addressed the problems of calculating the tangents of curves, the areas of an object with curved boundaries, the maxima and minima of functions, and in its Newtonian configuration the relations between fluxions (meaning the velocity of increasing). The mathematical calculus focuses on the measurement of change. Understood as such and thought in the context of architecture, the calculus, could be described as the systematic speculation and anticipation of change (spatiotemporal, geometrical, or other). In the case of the architectural calculus of Whitehall, this relates to its ability to provide a framework for future change (function 3). Most often, architecture uses the calculus in order to anticipate and contain change and by providing a structure for it, it attempts to guide and control it. However, it needs to be noted that this is a Newtonian understanding of the calculus, which has been dominant in architecture, especially in the use of differential topology. Tal Bar in her Ph.D.

\(^{299}\) Gottfried Wilhelm von Leibniz, Nova methodus pro maximis et minimis, itemque tangentibus, quae nec fractas nec irrationales quantitates moratur, et singulare pro illis calculi genus, in Acta eruditorum, Lipsiae, 1684. In this book Leibniz defines the rules between infinitesimal calculus that govern the calculation of second and higher derivatives and establishes the infinitesimal calculus.

\(^{300}\) Isaac Newton, Philosophiae naturalis Principia mathematica, (Cambridge: Cambridge University 1713) - (first edition 1687).

\(^{301}\) Archimedes, The Method of Mechanical Theorems, (Περὶ μηχανικῶν δευτερημάτων πρὸς Ερατοσθένη Ἐφοδόκον) takes the form of a letter from Archimedes to Eratosthenes. The method of Archimedes recently discovered by Heiberg; a supplement to the Works of Archimedes, (Cambridge: Cambridge University Press, 1912) (translated by Thomas Little Heath).
thesis, Digital Architecture and Difference: A theory of ethical transpositions towards nonrepresentational embodiments in digital architecture (2017), stresses that: The Leibnizian infinitesimal differential calculus is positioned as an alternative to the Newtonian interpretation of the calculus, which took centre stage throughout the eighteenth century and found its way into the topology that underlies current parametric software. The Leibnizian process of acquiring perspective is significant because it articulates a process of relationality that is entirely generative that is to say, none of the traits that identify a point of view is there at the beginning of the process. The relationality is acquired via a process of differentiation, which is unique to the position of the entities in question, understood bodily as stemming from a non-cognitive, non-rational, which is nevertheless non-emotional, perception.\textsuperscript{302}

Leibniz regarded that our conscious perception is constituted by minute unconscious perceptions that are constantly shifting. Thus, our perception of the world is based on a differential relation. For Leibniz, the differential calculus was a mechanism that appealed to both the mathematical and psychological. This understanding of the calculus could inform the spatiotemporal aspects of architecture in a completely different way. Daniel Smith explains: "Space and time here cease to be pure a priori givens (as in Kant), but are determined genetically by the ensemble or nexus of these differential relations in the subject. Similarly, objects themselves cease to be empirical givens and become the product of these relations in conscious perception.\textsuperscript{303} Apart from the calculus, Gottfried Leibniz put forward in his writings also the idea of calculus ratiocinatus, a concept for a universal logical calculation on which, the development of modern logic was based.\textsuperscript{304}


\textsuperscript{304} According to Ivor Grattan-Guinness, the modern logic has an algebraic and a mathematical tradition. The first one presented in The Mathematical Analysis of Logic (1847) of George Boole and the second one by Gottlob Frege’s Begriffsschrift (1879) and Charles Sanders Peirce in the Logic of Relatives (1870). The development of the computer software programs was based on this mathematical logic and the concept of calculus ratiocinatus.
The architectural calculus (of the Whitehall plan) form of calculation. In his short text Fundamenta calculi ratiocinatoris\textsuperscript{305}, Leibniz stresses that all human reasoning is based on the use of signs or characters\textsuperscript{306}. Hence, it is essential to see how in calculations, signs can avoid representation and grasp the infinitesimal and invisible continuum of the world.

Felix Guattari has proposed a semiotic theory that crosses the limitations of human language and the structuralist distinction between signifier/signified, expression/content\textsuperscript{307}, or subject/object. Instead, it suggests moving from the molar to the molecular, from models to processes, focusing on the assemblages of the different semiotics, on multiplicities, and their affects. Guattari distinguishes semiotics into a-semiotic encodings and signifying semiologies. A-semiotic encodings refer to natural encodings such as genetic encodings and other material intensities that formalize but are not translatable. Signifying semiologies, on the other hand, are based on sign systems and semiotically developed substances. They consist of symbolic semiologies that put into play several types of substances; such as the gestural and ritual semiotics of archaic societies, and semiologies of signification that are centered on a single signifying substance and bring together the signifier and the signified. Finally, and most importantly, Guattari defines a-signifying semiotics as post-signifying semiotics that produce no significations or representations, but function as diagrams on a molecular level\textsuperscript{308}. A-signifying semiotics operate as machines and convey expressions that could be characterized as non-human. Machines here have to be understood beyond the technical or the technological and rather as multiplicities of elements creating assemblages. Francisco Varela defines a machine as “the set of inter-relations of its components independent of components themselves”\textsuperscript{309}. Thus, a machine exists beyond its materiality, it constitutes what Guattari calls ‘incorporeal universes’, ‘fluxes’, ‘existential territories’, and ‘phylums’. “Examples of a-signifying semiotics would be a machine

\begin{itemize}
\item \textsuperscript{305} Leibniz, Gottfried, ‘Fundamenta calculi ratiocinatoris’, Academy Edition, Series VI, Vol. 4, No. 192.
\item \textsuperscript{306} Peckhaus, Volker, ‘Calculus Ratiocinator vs. Characteristica Universalis? The Two Traditions in Logic Revisited’ in History and Philosophy of Logic 25 (1):3-14 (2004).
\item \textsuperscript{307} Louis Hjelmslev’s work of the late 1960s and early 1970s on categories of expression and content.
\end{itemize}
of mathematical signs which lacks the vocation of producing significations; or an artistic, musical, economic, scientific technicosemiotic complex.\footnote{Ibid. 150.}

Taking the above into consideration, one could argue that the calculative practices in architectural design and in government operate exactly in this way. The introduction of measurement and the quantification of the design parameters substitute qualitative elements to mathematical signs and abstract them from their context. This way, they are “no longer things, as they were in the past, but rather semiotic assemblages, which may consist of human beings, mechanical or electronic devices, and incorporeal elements.\footnote{Maidan, Michael, https://marxandphilosophy.org.uk/reviews/7947_signs-and-machines-review-by-michael-maidan/, accessed 3/7/2019. See also: Lazzarato, Maurizio, Signs and Machines, Capitalism and the production of subjectivity, (New York: Semiotext(e) foreign agents series,2014).} Indeed, calculations have the ability, operating through a-signifying semiotics, to form abstract machines that are at the same time, technical and social, scientific and economic, that transverse and connect diverse entities through their defined arrangements (definition 4). Abstract machines explain Deleuze and Guattari operate within concrete assemblages opening them to something else. They know nothing of forms and substances. “They consist of unformed matters and nonformal functions. Every abstract machine is a consolidated aggregate of matters-functions. This is evident on the technological plane, for example, such a plane is not made up simply of formed substances or organizing forms, but of a composite of unformed matters exhibiting only degrees of intensity and diagrammatic functions exhibiting only differential equations.\footnote{Deleuze, Gilles and Guattari, Felix. “Abstract Machines (diagram and phylum)” in A Thousand Plateaus, Capitalism and Schizophrenia, (London: Bloomsbury Academic, 2013), 593. See also: Rauning, Gerald. “Abstract Machines”. A Thousand Machines, (New York: Semiotext(e), M.I.T. Press, 2010). 91-120. For the definition of an abstract machine see also notes on terminology in part 1.2 of the thesis.} Abstract machines as informal diagrams differentiate from concrete machines such as the assemblages of a school, prison, hospital, or office. The abstract machines that calculations can put forward, determine and expand the concrete machines of architecture to meet and connect with other assemblages, operating on an invisible level. This way, the concrete machine of the architecture of the Whitehall plan for example, through the abstract machines of its calculations, operates as an apparatus. The architecture of the Whitehall government centre,
as the thesis will demonstrate at the next part, comes to meet through the abstract machines of calculations, the technological knowledge assemblages of scientific research, the state-industrial complex, and technocratic practices, becoming an apparatus of governance. As Deleuze explains machines are social before being technical or architectural in this case. "The material machines have to be chosen first by a diagram and taken up by assemblages" 313.

Taking into account the function of semiotics as analyzed above, let us expand on our previous analysis of the Whitehall plan. This time, we will attempt to understand it in terms of the economy of the subject 334 in order to demonstrate its potential to direct the subject and thus function as an apparatus. The Whitehall plan registers the subject on multiple levels. Firstly through the representational ability of the architectural form, the plan produces meaning and symbolism on a social level, which as we examined in more detail in the previous part (3.2) partakes in the formation of the individual as an equal subject of rights within the state and as a social citizen of the modern welfare state. The architecture that is put forward by the Whitehall plan presents the modern welfare state as an agent of social consensus by addressing all individuals (visitors, politicians, and employees) as equal members of it and by registering a clear figure of the social citizen that is part of the operations of the centre. In regard to the emergence of the figure of social citizen, Nikolas Rose observes that "in the middle decades of the twentieth century, one sees the invention of the social individual, whose character was shaped by social influences, who found his or her satisfaction within the social relations of the group. This was not an abstract event in knowledge or a cultural shift in meaning. The new images of the individual were elaborated within specific institutional sites, in relation to specific problematizations of conduct and through the new systems of visibility, identification, classification, assessment, and judgment that they established" 325. These systems of visibility and conduct are put in place in the national government centre of Whitehall. They are realized through the ways that the


The architectural calculus (of the Whitehall plan) plan shapes its architecture and addresses the citizens, by providing access and space for social interaction and recreation. The formalization of the state-citizen relation through the representational capacity of the architectural form and the treatment of public space, allows for a clear delineation (subjectification) of the individual as a social entity, as a social citizen of the welfare state that is partaking in the institution of society as a whole. However, at the same moment, the calculative logic of the architecture permits also modes of de-subjectification to be put forward. The architecture planned for Whitehall attempts to define the social subject through the representational signification of an inclusive social institution of government, while, the internal calculative logic of the project and its buildings, is explicit of a design rationality that addresses the subject as a component within a calculated system. This way, the plan bares, divides, and diffuses that same subject that it in first place attempts to compose. In this sense, it is telling of the changes that take place in the 1960s and that the thesis will examine in the next part, where the developed and well calculated British welfare state is diffused and transformed by the calculative and scientific logic and practices that it employed. While the project tries to put forward a well calculated plan for the welfare state, this is undermined and contested by its own internal calculative logic.

Indeed, the synthesis of formulas that provide architectural solutions, transforms the design process into a mathematical operation. This way, the architectural design of Whitehall functions also on an operational and diagrammatic rather than solely representational level. Reinhold Martin in The Organizational Complex Architecture provides an expanded elaboration on how architectural design can not only be representational, but operative by forming machines that include objects, images, and discourses. Luciana Parisi has shown in her book Contagious Architecture that calculations by forming algorithms can spatialize data and implement spatiotemporal structures. Calculations organize the

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The architectural calculus (of the Whitehall plan) space allocation and define the arrangement of activities in space and time. A system is created, which abstracts real entities and engages them in specific operations that are determined by the calculations. The signs and operations of the calculus no longer distinguish between human and non-human, between subject and object. As the calculus transforms qualitative information (regarding the users’ characteristics, spatial and geometrical qualities, etc.) into mathematical signs, it bares them from any subjective characteristics, particular attributes, or signification. Hence, it engages them in an abstract spatial and quantitative relation, governed by specific rules. The connections that emerge relate these a-signifying elements (mathematical signs) between them, producing material affects and spatiotemporal rationalities that cannot be understood on a representational level. The calculus creates ‘incorporeal universes’ in the form of assemblages that address people and other systems (economic, scientific, etc.) through abstract machinic processes within and beyond the concrete architectural apparatus of the government centre. It transforms matter, quality, and subjects into coded flows of data interrelated through immaterial formulas that recognize only elements of input and output and that can exist in diverse systems. These assemblages do not distinguish between human and non-human. This way, the a-signifying semiotics of the calculus, orchestrate movements, flows, intensities, vibrations, and rhythms. They activate actions, reactions, behaviours, and attitudes. The subject becomes a component part of this abstract machine, indiscernible from non-human elements. The a-signifying semiotics of the calculus engage the individual on a machinic level transforming the employee - worker to a calculated occupier of the office space that performs specific tasks based on inputs and outputs, to a numerical component within the megastructure of data. Moreover, the citizen is transformed into a calculable part of information, the visitor and consumer of its leisure and infrastructural facilities into market sample data. The actions and operations of subjects have in fact been anticipated within the design calculus put in place. This way, one could say that the subject becomes diffused and desubjectified. The social citizen is turned into a component of codes and calculations that can be incorporated in the planning and development of governmental policies. It becomes divided and transformed.

338 This is one of the ways, that one could say, following Deleuze and Guattari that smooth (nomad) space is be captured and transformed into striated (State sedentary) space. See: Deleuze, Gilles and Guattari, Felix, “1440: The Smooth and the Striated”, A Thousand Plateaus, (London: Bloomsbury, 2013), 551-581.
The architectural calculus (of the Whitehall plan) into a dividual. Gilles Deleuze proposes this term when he describes the crisis of enclosed environments (hospitals, schools, factories) that takes place after World War II and the transition from disciplinary societies\textsuperscript{319} to what he names as societies of control. He notes that in the latter, control is exercised through modulations within open spaces rather than disciplinary mechanisms within closed ones. One could say that this is also the case at the Whitehall government centre, where an open public space is to be controlled by a specific calculus. This way, Deleuze adds, the “individuals have become dividuals and masses (have become) samples, data, markets, and banks”\textsuperscript{320}. Dividuals are not characterized by signatures as the individuals do, or by numbers as the masses do, but by codes “as the numerical language of control is made of codes that mark access to information or reject it”\textsuperscript{321}.

This divided subjectivity depicts a formation of subjectivity that is part of extra-linguistic and non-human elements and processes. The calculus of the design, functioning through a-signifying semiotics, produces affects and spatial rationalities that engage the subject on a machinic level. As Maurizio Lazzarato suggests this also reveals the twofold cynicism of capitalism: “the humanist cynicism of assigning us individuality and pre-established roles (worker, consumer, unemployed, man/woman, artist, etc.) in which individuals are necessarily alienated; and the dehumanizing cynicism of including us in an assemblage that no longer distinguishes between human and non-human, subject and objects, or words and things”\textsuperscript{322}. This new economy of the subject operates on both molar (perceptible) and molecular (imperceptible) level, traversing the subject. The individuals become dividuals as they are barred from their subjectivity and transformed into calculable pieces. The abstract machine of calculations captures processes of consumption, production, and citizenship

\textsuperscript{319} For a definition of disciplinary power see part 1.2.

\textsuperscript{320} Deleuze, Gilles, “Postscript on the Societies of Control”, October, Vol. 59. (Winter, 1992), 5.

\textsuperscript{321} Ibid.

A thorough analysis and genealogy of the term is provided by Gerald Rauning in his book Dividuum., where he traces the term from the translations of Epicurus and Plato by Cicero to the present algorithmic applications. See “The philosophy of In-/Divisibility” and “Partition, participation and division” in Rauning, Gerald, Dividuum, Machinic capitalism and molecular revolution, (Cambridge: Semiotext(e) M.I.T. Press, 2016), 39-43 and 73-82.

The architectural calculus (of the Whitehall plan) within space and hence shapes, in many ways, the behaviour and actions of the subject / user. The (architectural) calculus manages to control desires and rationalities by imposing measures, connections, rhythms, and flows. A form of government is thus deployed that binds “more than human communication. it implicates as well, an entire complex of “extra-human semiotic machines”\textsuperscript{323}. This has become even more evident in the contemporary world, where the collection, distribution, and use of data, has the ability to direct the actions, desires, and practices of people based on algorithms, establishing what is named algorithmic governmentality.

This is also noticeable by the fact that architecture nowadays takes the form of fully automated environments and machinic landscapes, as for example is the case with the contemporary data centres and distribution warehouses (usually designed by engineers rather than architects), that function based on a logic of absolute calculability. In parallel, architecture is materialized as elaborate and thoroughly calculated forms that aim to produce affects and promote “spatial communication”\textsuperscript{324}. In these processes, it is the calculative practices that have the ability to define and create absolute, relative, and relational spaces. David Harvey understands space through this tripartite division of absolute, relative, and relational space. Absolute space is “fixed and we record and plan events in it, this is the space of Newton and Descartes that is represented through standardized measurement [...].Socially this is the space of private property and other bounded territorial designations.” Relative space can be considered as “a relationship between objects which exist only because objects exist and relate to each other.” This space is associated with Einstein and the non-Euclidean geometries of the 19th century. Here “the spatial frame depends upon what is being relativized and by whom.” It designates a foregrounding of spatio-temporality. Finally, relational space is “associated with Leibniz who, in a famous series of letters to Clarke (effectively a stand in for Newton) objected vociferously to the absolute view of space and time [...] There is no such thing as space and time outside the processes that define them [...] Processes do not occur


in space but define their own spatial frame. The concept of space is embedded and in or internal to process...it is impossible to disentangle space from time [...] An event or a thing cannot be understood by appeal to what exists only at that point. It depends upon everything else going on around it[...] A variety of disperse influences swirling over space in the past, present, and future concentrate and congeal at a certain point to define the nature of the point.” 325. These three understandings of space can be respectively related to the material, conceptual and lived space and when one attempts to relate these definitions of space to the practices of calculations, one observes that absolute space is primarily measured and calculated (definition 1 of calculus), relative space is defined by a system of rules and processes (definition 2 of calculus), and relational space can be formed by abstract machines that are technical and social, scientific and economic, and can accommodate change (definitions 3 & 4 of calculus). Hence, for some architects, the employment of technologically engineered and precisely calculated tectonic articulations enables the semiological - informational ability and phenomenological legibility, so the affective impact of the building form, and constructs a communicative frame between the building, its user and the urban context. Interestingly, one notes that both the affective and the machinic attributes of contemporary architecture rely upon complex calculations and the processing of extensive data collections. This is an approach in architectural design that as we will examine in the next part, emerged in the late 1960s and affected the practice of architecture thereafter. The Whitehall plan was one of the first projects that were designed according to such logic.

Returning to our initial investigation and considering these observations in relation to the operations that the Whitehall plan proposed, one can now conclude that the formation of the project is such that while on one hand, it attempts to constitute the subject as a social citizen and to promote the development of the welfare state, at the same time it captures the subject, in an abstract machine of calculations that transforms it into a dividual, implicating it in a form of calculative government. This way, the operations of the centre are contained by a calculative logic that undermines and contests the efforts to form a space of participation and welfare. The subject transformed into a dividual does

not anymore carry any social purpose, significance, or orientation. It becomes a component within a larger assemblage of calculations. In this sense, one could note that architecture operates as an apparatus. Not an apparatus that attempts to form a social citizen, but as one that contains the subject in an abstract machine of calculations that transcend it. This way, it makes possible what Bruno Latour names as an action at a distance, "a complex mechanism that makes it possible to link calculations at one place with action at another, not through the direct imposition of a form of conduct by force, but through a delicate affiliation of a loose assemblage of agents and agencies into a functioning network." Hence, it becomes possible for political and economic mentalities and strategies to affect architecture and its subjects, through the calculative practices that dictate and produce it.

In this part, the thesis examined how the calculative logic of the architectural design can form calculative spaces and calculated subjects. Moreover, through the mathematical and theoretical analysis of the calculus, the thesis determined the ability of calculations to relate architecture with strategies of government, activating architecture as an apparatus of governance. As the thesis will demonstrate in the following part, the calculative logic in the practices and production of the architecture of the welfare state has become dominant through the adoption of a scientific mentality in architectural design. This approach has a long history but has strongly affected the practice of architecture of the welfare state from the 1960s onwards. In the next part, the thesis is going to investigate how similar calculative practices were telling of a scientific way of thinking both in architecture and government. It will attempt to draw a parallel and demonstrate that they were the result of a specific political economy and mentality that was under formation in Britain at the time. This way, it can become apparent that the calculations employed within the architectural project of Whitehall were part of an abstract machine of calculations that achieved to constitute architecture as an apparatus that mediated between political economy and the economy of the subject. These affiliations are not only formed because of the dependency of one agent to another, but also by their common direction. Thus, the thesis will try to demonstrate how these calculative

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The architectural calculus (of the Whitehall plan) mentalities and practices transformed the design process and production of the architecture of the welfare state, aligning them to those of neoliberal governance.
B. The architecture of neoliberal technocracy.

The second moment (operation) that the thesis analyses, is the role and application of calculations within the process of technisization and managerialisation of the welfare state's governmental machine, following the transformation of the British civil service into a modern techno-bureaucracy. The thesis investigates how these practices and discourses, appear both in the administration of the state and in the considerations of architecture at the time. The thesis positions the Whitehall plan of 1965 in the context of an architecture of science that developed from 1960s onwards, mainly in Britain and the USA and problematizes it in relation to the technocratic mentalities and calculative practices that were being realized in government and politics at the time.

Calculations allow for optimization, time, cost, and labour control and efficiency to enter the design process transforming it into an inherently economic action. While the thesis appreciates the importance of calculations as an analytical and scientific tool, it aims to underline the way in which this tool has been employed by neoliberalism in order to neutralize its policies and most importantly to facilitate a non-visible connection between public institutional architecture and financial processes. The thesis examines how these calculative mentalities and practices have transformed the design process and production of architecture and enabled the transition from an architecture of science to an architecture of neoliberal technocracy. The thesis argues that this has been achieved through the trojan horse of technocratic thinking and scientific management that became the vehicles via which the neoliberal calculative practices developed in the 1960s. These same technologies spread as modes of thinking and achieved a transformation within many different disciplines in parallel aligning them to neoliberal forms of governance. The thesis claims that it is precisely through these practices that a form of governance that has no political appearance becomes possible. This form of governance, that operates though means and mechanisms that are practical rather than political. They do not function through political processes or institutions but instead through the management of the people’s rationalities and practices.
3.4 The white heat of scientific revolution and the rise of neoliberal technocracy in Britain.

This part of the investigation begins with the examination of the scientific processes and mentalities that develop within the British welfare state in order to unravel how they contributed to the development of neoliberal technocratic practices. Two years before the publication of the Whitehall project report, in October 1963, Harold Wilson, the future British Labour Prime Minister\textsuperscript{327}, addressed the Labour Party in its annual conference by stating: “In all our plans for the future, we are re-defining, and we are re-stating our socialism in terms of the scientific revolution. But that revolution cannot become a reality unless we are prepared to make far-reaching changes in economic and social attitudes, which permeate our whole system of society. The Britain that is going to be forged in the white heat of this revolution will be no place for restrictive practices or for outdated methods on either side of industry”\textsuperscript{328} (Fig.3.31). With his speech, Wilson attempted to create a new image for socialism and propose the formation of a New Britain based on scientific modernization and professionalism that would influence the recently formed critical electoral population of affluent white collar workers. The speech reflected a growing scientific and technocratic mentality in British politics and eventually in the country’s government during the 1960s and 1970s. According to it, the modernization of Britain would be achieved through the application of scientific management\textsuperscript{329} in the practices of government and by a form of planning that would pursue growth through the development of science and technology. Economic calculations, factors of efficient performance, and accounting for quantifiable results were at the very core of this governmental logic that aimed to reform the existing bureaucratic structures of the British welfare state.

\textsuperscript{327} Elected on the 15\textsuperscript{th} of October 1964. Wilson was the first Labour Party Prime Minister since 1951.

\textsuperscript{328} Labour Party Annual Conference Report, 1963, 139-140.

\textsuperscript{329} For the history of management and how it was transposed as a term from the administration of the domestic space of antiquity to the operational supervision of railroad infrastructure and factories in the 19\textsuperscript{th} century, as well as its initial distinction from the government of autonomous people, read: Le Texier, Thibault, Le maniement des hommes, (Paris: La Decouverte: 2016).
Fig. 3.31 - Harold Wilson arriving in Downing Street after the elections of 1964 that he won by proposing a scientific modernization of the state.

When Wilson became Prime Minister in 1964, he put forward a series of initiatives based on these principles, intending to modernize the state, increase industrial production, and exports and achieve economic growth. He established the Department of Economic Affairs (D.E.A.) that aimed to develop policy making and economic planning through the application of quantitative techniques and spatial modeling in industry. This way, the Labour government wished to avoid an unregulated economy and to control the economic growth in a socially purposive way, making use though, of specific calculative practices. The D.E.A. developed the National Plan of 1965 (Fig. 3.32) that foregrounded four major

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Scientific revolution and the rise of neoliberal technocracy in Britain

objectives: the correction of the existing imbalance in payments, the speeding up of the rate of growth, the securing of a better regional balance of development and ensuring that future growth is used in accordance with the needs of society.\textsuperscript{331} Within this program, scientific and technological development was to play a major role in reorganizing the industrial production. Britain would employ scientific and technological resources under a national plan towards industrial applications that would revolutionize its economy and allow for social progress. For this purpose, Wilson proposed expanding higher education in order to train scientific and technical professionals that would be able to work within an institutional framework for the industrial development of the country. He also underlined the importance of nurturing economic growth through government sponsored civilian rather than military scientific research, that would be applied in the under-development state industries. Most importantly, he prioritized the establishment of the Ministry of Technology\textsuperscript{332} (MiniTech) that was formed in 1964 to bring scientific and technological knowledge into the industry. The MiniTech was responsible to address all government military and civil interests (private and nationalized) in science and technology, energy, aerospace, and all manufacturing industry. In addition, it initiated and shaped the development of the British computing industry. As it will explained later, within this framework, the Ministry of Public Works and Buildings, under the Directorate of Research and Information, initiated expanded research for the development of the construction industry and more specifically the application of computers in architectural design. The Whitehall plan being one of the initial projects of this initiative.

\textsuperscript{331} The plan was launched on the 16\textsuperscript{th} of September 1965 by George Brown, the Secretary of State for Economic Affairs (1964 – 1966) and was discussed in the Parliament in November of 1965. For more details see: House of Commons, Debate 03 November 1965, vol. 718, cc1041-1063 in https://api.parliament.uk/historic-hansard/commons/1965/nov/03/national-plan (accessed 03.04.2019)

\textsuperscript{332} The Ministry of Technology that was established in October 1964 by the Wilson government, was built upon the existing work of the Department of Scientific and Industrial Research that existed in British government from 1915 till 1965.
This scientific mentality in government was reflected not only in investments and research but also in its own formation and operation. In February 1966, Wilson announced the launch of a departmental committee under the chairmanship of Lord Fulton, consisting of academics, MPs, civil servants, and representatives of the industry, that would examine the structure, recruitment, and management within the civil service. The results of this enquiry were published in 1968 in a
report for the civil service identifying five major problems and making a hundred and fifty-eight recommendations. The main conclusion of the Fulton Committee report (Fig.3.33) was that the British civil service was a product of the nineteenth century, built upon a hierarchical structure, relying on the administrative and bureaucratic management of the generalists rather than the scientific expertise of specialists. According to the report, there were very few skilled managers, while engineers, scientists, and specialists were given little responsibilities. Some of the report’s recommendations were put into practice directly, while others took longer time to implement. In any case, the initiative reflected a change in the administrative mentality of the civil service that in combination with the new technologies introduced in the practice of administration, put into action a series of changes that were meant to alter forever the administration of the British government.

The bureaucratic form of management within the administration of the British state relied on the Weberian model of rational-legal authority. It followed strict rules, a rigid hierarchy that allowed for little flexibility and specific sets of guidelines that although often rational, they were not informed by any specialized scientific knowledge. The Wilson government attempted to renew the operations of the British welfare state, moving from a bureaucratic to a scientific model of organization and management within the civil service, but also in the wider governmental structure. This model aimed to replace civil servants by experts that could use new technologies and employ scientific methods in their work. Scientific management examines, distributes, and standardizes work practices by implementing precise processes and applying scientific knowledge on them. Work and production results are calculated, and outputs measured.


335 The principles of scientific management were published by Frederick Winslow Taylor in 1911 proposing a mode of management that relies on the development of a science for each type of work replacing empirical knowledge with scientific. Work would have to be practiced according to these principles and there is a shared responsibility between managers and workers. Scientific management or Taylorism was employed extensively during the 20th century in both private enterprises and public bureaucracies.
in detail through data. Managers overview the process, and skilled workers and experts concentrate on the attainment of specific tasks. Both models, bureaucratic and scientific, build and depend upon calculability and rationalization. The main objective of scientific management though is to improve economic efficiency and especially labour productivity using scientific knowledge rather than simply follow rules.

Fig.3.33 – The report on the civil service published by the Fulton Committee in 1968.
One of the ways to increase efficiency and institute new methods of work in the civil service was through the introduction of computers. The British government and civil service started computerizing their processes throughout the public sector during the 1960s. Computers were to be used even by generalist civil servants and automatic data processing programs were introduced in most governmental departments. Between 1963 and 1965, following the American example, the first databank, the Social Science Research Council Data Bank (S.S.R.C.) was established in Britain at the University of Essex. The databank used information from many government departments and industrial market researchers forming a private-public entity. Interestingly and this is something to underline here, the first data bank was formed for social research that would serve both the operations of the market and the state. In parallel, the work on these new operations and fields of government gave rise to a class of technology specialists and managers, that gradually transformed the bureaucratic processes of government to technobureaucratic ones. This was an effort supported by both the Labour and the Conservative Party during the 1960s and 1970s. It aimed to modernize the civil service and the wider mechanisms of the welfare state, as well as to support the growing computer British industry and economy.

The efforts to modernize the British welfare state based on scientific knowledge and technological expertise were common in the political programs of both the Labour and Conservative Party, although expressed more explicitly in the rhetoric of the first one. As Adam Sharr and Stephen Thornton note “there were plenty of examples of proto-white heat conservative policies”:

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337 The Data Bank has today taken the form of U.K. Data Archives and holds the largest collection of population data from over 50 years. See: https://www.data-archive.ac.uk/ (Accessed on 30th August 2019).


339 “This experts’ movement, named Organization and Methods, was formed by a centre in the Treasury extending through the Ministry of Transport, the Ministry of Aviation, the Ministry of Technology, the hospitals and nationalized industries and even to large private firms, such as Shell.” Ibid., 333.

of the National Economic Development Council\textsuperscript{341} (N.D.E.C.1962) prior to the D.E.A (1964), the Trend Committee on civil research and development (1963) before the Fulton Committee (1966), a new industry ministry (1963) and the first Minister of Science (1960)\textsuperscript{342}. It was also the Conservatives in 1963, that took the decision to demolish Gilbert Scott’s Foreign office building and asked Leslie Martin to build a modern government and national centre in Whitehall. While in the same year they reinitiated the efforts for research in the construction domain that had started in 1949 under Attlee’s Labour government. In a way, Wilson’s rhetoric on the scientific revolution was an attempt to address the Conservative Party’s prior initiatives for economic growth through modernization and scientification. At the same time, Wilson expressed ideas that existed for a long time within the Labour Party and were first formulated in the cabinet’s papers A Labour Government and Science\textsuperscript{343}. In these papers, Patrick Blackett, the Nobel-prize scientist and president at the time of the Association of Scientific Workers (A.Sc.W.) first proposed the establishment of a Ministry of Technology and Charles P. Snow\textsuperscript{344} nurtured the idea for an increase in technical and scientific expertise and research. David Horner explains that “In the context of post-war reconstruction the A.Sc.W. produced a comprehensive blueprint for the reformation of Britain’s science in Science and the Nation (1947) (Fig.3.34). This prefigured many of the ideas and themes that re-emerged in Wilson’s modernization policies in the early 1960s”, while it built upon a Marxist-socialist idea of science as an agent of social and economic planning\textsuperscript{345}

Wilson through this rhetoric aimed to reconcile the division between traditionalists and revisionists within his own Party. Revisionists considered that

\textsuperscript{341} Margaret Thatcher downgraded the influence of N.E.D.C. till it was finally abolished in 1992.

\textsuperscript{342} Lord Hailsham was appointed Minister of Science in 1960 and Edward Heath as Secretary of State for Industry in 1963.

\textsuperscript{343} Interestingly, this is a priority that Jeremy Corbyn has recently put back into the Labour’s Party campaign. In the Labour’s Party manifesto of 2017, he writes: “Labour has always been the party of science. From Clement Attlee through Harold Wilson’s ‘white heat’ of technology to the unprecedented levels of funding received by universities under the last Labour government, our party has always championed science as an engine of social and economic progress.” Retrieved 30th August 2019 from:  http://www.sciencecampaign.org.uk/resource/letter-labour-jeremy-corbyn-2017.html


\textsuperscript{345} Ibid.49.
the Party should adjust to the desires of the affluent, white-collar professionals that were nurtured by the welfare state and were rising as the new middle class in Britain. These ideas were represented by the Fabian Society\textsuperscript{346}, Hugh Gaitskell\textsuperscript{347} (the previous Labour leader) who had proposed the withdrawal from the socialist principle of nationalization and the public ownership of the means of production in favor of a mixed economy and Anthony Crosland, that proposed focusing on matters of personal freedom, cultural development, and entrepreneurship instead of economic ones. In his book, The Future of Socialism, Crosland writes: “We need not only higher exports and old age pensions, but more open air cafes, brighter and gayer streets at night, later closing hours for public houses, more repertory theatres, better and more hospitable hoteliers and restauranteurs, brighter and cleaner eating houses, more riverside cafes, more pleasure gardens, better design...”\textsuperscript{348}. One cannot but notice that these are all elements and programs that Leslie Martin and his colleagues incorporated in their proposal for the new government centre in 1965. The centre combined governmental offices with shops and cafes addressing people as costumers as well as citizens, mixing government operations with commerce and leisure and reflecting a more open and flexible image of government based on economic affluence and personal choice.

One can argue that Wilson and the Labour Party, through the adoption of a technocratic and scientific approach to government, took a reformist turn, which reinforced and sustained capitalism rather than promoted socialism. Taking into consideration the above, one can suggest that both the Conservative and the Labour Party during the 1960s were swept by a technocratic ideology that although it carried different roots (American Taylorism and Soviet scientific socialism), it was eventually expressed in political practices and rationalities that were similar to each other. The main difference between the Conservative and Labour Party on these matters consisted in their disagreement on the degree of state intervention and planning in industry and technology. The Conservatives supporting the ideas of classical liberalism that promoted individual initiatives,

\textsuperscript{346} A socialist organization founded in 1884 to promote reformist rather than revolutionary practices in socialism.


\textsuperscript{348} Crosland, Anthony, The Future of Socialism, (London: Jonathan Cape, 1956), 520-524.
private capital and a free market as the major factors in progress, while the Labour Party considered that the primary role on this, should be played by the state as an institution that represented and acted on behalf of society. Nonetheless, they both prioritized science and technology as the major factors of economic and social growth and developed discourses and initiatives that were based on a rational and calculative logic, foregrounding the importance of scientific expertise. This way, this thesis argues that they managed to reform the British welfare state by proliferating and applying such practices and rationalities within it.

Fig.3.34 - Science and the nation was the blueprint for the reform of Britain based on science (1947).
In reality, the technological and scientific rationality has proliferated since modernity in parallel to the development of bureaucratic administration and capitalism. However, it is important to note, that science and technology were not always interdependent. Science started informing the technological development after the scientific revolution of the early modern period when science was professionalized and institutionalized and the gradual development of capitalism could finance technological experimentation and innovation.\(^{349}\) From the eighteenth century onwards and especially during the nineteenth century, science and technological development started being directly linked to industrial utilization, supported by state intervention or by private capital. Capitalism requires and builds upon this purposive rational action of technology and science, the expansion of which, has led to the administration of societies by it. This rationalization of modern society is characterized by the mathematization of knowledge and of social experience through quantification, measurement, and the prioritization of efficiency, by the insistence on rational evidence and the use of reason both in scientific knowledge and the conduct of social life. This way, normativity is replaced by performativity, as Jean-Francois Lyotard explains. "The production of proof falls under the control of a game in which performativity is the goal: the best possible input/output equation...An equation between wealth, efficiency, and truth is thus established...Scientists, technicians, and Instruments are purchased not to find truth, but to augment power."\(^{350}\) In reality, science and technology provide justification and legitimization for the application of political power. Yet, a long debate exists on the objectivity of technology and the degree in which it depends upon social, political, and economic aspects, or it is independent of them. Actor-network theory understands society and technology as being linked to each other, connecting human and non-human elements. For Marxism, technology and innovation are essential elements in the development of capitalism; "technological decisions are also economic decisions"\(^{351}\) and cannot but exist within society. It is not within the objective of the thesis to expand on this specific

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\(^{349}\) For many analysts, technological innovation is considered one of the major instruments of capitalism through its ability to expand the existing markets by the invention of new commodities.

\(^{350}\) Lyotard, Francois, The Postmodern Condition: A Report on Knowledge, (Manchester University Press: 1984), 45-46. In the same text Lyotard distinguishes between objective truth and social justice; between what is objective truth and socially agreed.

issue, however, the approach developed here is based on the position that although technology and science rely on objective laws as closed systems, their application and direction is dependent on the institutional and economic framework of society, which eventually affect the evolution of the principles of these closed systems.

The technocratic mentality considers that science and technology are and should become the objective criteria for government. Decision making has to rely on scientific and technical knowledge and social problems can be solved following scientific methods. In its extreme form technocracy aims to a government formed by scientists and technology experts, where governmental decisions would be technical rather than political. Walter Armytage in his book The rise of technocrats traces technocracy back to Francis Bacon and his New Atlantis, Enlightenment and the rise of reason, the transformation of physiocracy to physicism, the Polytechnicians that equipped the European governments from the 19th century onwards, the utopian socialist ideas of Henri de St. Simon, the positivism of his student Auguste Comte, the scientific socialism of Engels, the Soviet project under Lenin and finally the application of the scientific method in the industrial management by American Taylorism (the last two developing an interesting interrelation). The term technocracy first

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353 The New Atlantis was written in 1622 envisioning a society where the research scientist would rule. The book expressed the historical importance of science and technology. Previously, Bacon developed an inductive investigative in his book Novum Organum (1620) that influenced the formation of scientific method in the 19th century.

354 Physicism developed a materialist conception of the world.

355 Comte developed ideas in favor of scientific planning and against the natural law of the market advocated by classical liberalism as he claimed that: “from science comes prediction; from prediction comes action.” And that “Nothing can excuse the metaphysical school of economics for systematically resisting the intervention of human wisdom in the various departments of social action”. In addition, he suggested an evolution of society towards a more positivistic form of thinking and organization. His ideas on social evolution resemble to a certain degree those of Karl Marx and Engels in Armytage, Walter H.G., The rise of technocrats, a social history, (London: Routledge, 1965), 74.
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appeared in 1919 in the USA by the engineer William H. Smyth, and became a movement aiming to replace capitalism during the 1920s and 1930s.\textsuperscript{357}

Forty years earlier, in 1880 Friedrich Engels had published Socialism: Utopian and Scientific,\textsuperscript{358} describing a form of socialism that is based on scientific method. The politico-economic theories of Engels and Marx were tested in the newly formed Soviet Union after the 1917 revolution. Marxism-Leninism aimed to redirect through planning and the development of technical intelligentsia, science, technology, and innovation, the productive forces of capitalism, in the service of the people. From the perspective of this bold alternative to capitalism, technocracy can be considered as the western response to these socialist efforts. During the 1920s and 1930s, American scientists visited the U.S.S.R. and as it was accounted: ‘The great laboratory of Russia provided American engineers with the opportunity to see large scale social engineering in action’.\textsuperscript{359} The engineers and scientists returning to the USA from these visits made the realization that “the ideals conceived by the Soviets are precisely those of the Taylor Society and that it is their aim to put them into practice on an unprecedented scale.”\textsuperscript{360} The Soviets had also been applying the principles of scientific management. In the USA though, these technocratic ideas gradually lost power due to the reformation of capitalism after the Great Depression and the influence of New Deal (1933), which reformed capitalism internally.

Britain had also started implementing a series of liberal welfare reforms (the first ones between 1906-1914 and they continued up to the 1930s as we saw in section 2.2) so the potential threat of socialism was existing but limited. In the general elections of 1931, the Labour Party campaigned in favor of socialist planning. Its manifesto explained that “A decisive opportunity is given to the nation to reconstruct the foundations of its life. The capitalist system has broken down

\textsuperscript{356} William H. Smyth described technocracy as “the rule of the people made effective through the agency of their servants, the scientists and engineers” in ‘Technocracy: National Industrial Management’, National Management 57, (March 1919): 208-212.

\textsuperscript{357} Technical Alliance the group founded by Howard Scott and the writings of the economist Thorstein Bunde Veblen, were that the heart of the technocratic movement in USA.

\textsuperscript{358} The term scientific socialism had been previously used by Pierre-Joseph Proudhon in 1840 to describe a society ruled by a scientific government.


\textsuperscript{360} Ibid.
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even in those countries where its authority was thought to be most secure” and proposed that “The Labour Party...reaffirms its conviction that socialism provides the only solution for the evils resulting from unregulated competition and the domination of vested interests. It presses for the extension of public-owned industries and services operated solely in the interests of the people. It works for the substitution of coordinated planning for the anarchy of individualistic enterprise. Labour insists that we must plan our civilization or perish”361. The same year a National Planning Commission (with a Bureau of Statistics), a Planning Centre for each Industry, and a ten-ministers cabinet was proposed by the Political and Economic Planning (P.E.P.) group362. After the first world war and during the Great Depression (1929-1933) British scientists visited the U.S.S.R. and were impressed by the Soviet technological advancements, while at the same time the Soviets were influenced by the efficiency that the new American companies presented. These experiences informed the proposal for a Parliamentary Science Committee that was put forward in 1932 by several scientific societies. These proposals were not realized until much later within the formation of the post-war welfare state. However, in the following decade, in order to address the demands of the war and the needs of post war reconstruction, the British government demonstrated an unprecedented series of planning initiatives and orchestrated its national actions under a cross party consensus. These efforts employed the industrial and scientific resources of the country and resulted in impressive technological progress and innovation. The post-war rationality of planning prepared the ground for the technocratic proposals of the 1930s to be revisited and partly implemented within the welfare state by the government of Harold Wilson in the 1960s,

The political discourse in the 1960s and 1970s in Britain was swept by the “white heat of technological revolution” and moved the focus on the benefits of science to society rather than on issues of planning and nationalization. As we saw, this discussion was promoted and sustained by both the Labour and the Conservative Party. Within the Labour Party, Wilson by foregrounding the discourse on


362 Aldous Huxley and Sir Basil Blackett were among the members of this think tank.
technology rather than the problem of nationalization and prioritizing the development of scientific expertise to achieve economic growth permitted a reformism that one can characterize as an abandonment of the principles of socialism and the initiation of the preliminary principles of Thatcherism and eventually neoliberalism. The technocratic practices of the 1960s and 1970s by prioritizing economic growth through technical innovation rather than wealth and material redistribution as it was the case with the postwar welfare reforms, prepared the ground for the neoliberal policies of the 1980s.

Technocratic practices in the form of calculative techniques became gradually integral in the operation of the British welfare state through the application of mathematics, statistics, and accountancy in the fiscal and bureaucratic procedures of the state. The Report for the Control of Public Expenditure (Plowden Committee Report)363 of 1961 promoted the application of these calculative techniques and the demonstration and evaluation of quantified evidence through the establishment of appraisal procedures for the governmental policies. The Fulton Report of 1968 proposed scientification and accountability in practices of the civil service and public administration. Hence, from the 1960s onwards a series of techniques were employed by public administrators to control the government expenditures of welfare provisions, while financial calculations were used to record, rank, compare and evaluate the welfare projects according to their economic and investment aspects364. These practices were built upon the existing welfarism365 of the British state, the existing structures, and technical programs of the welfare state. This way, as Nikolas Rose and Peter Miller, explain “personal judgment was to be replaced by the rationality of economic-financial calculation”366. Financial worth and economic growth became the objectives by which to evaluate what was essential and beneficial for society. The administrative structure of the welfare state became dominated by


365 For a definition of welfarism and the role it played in the realization of the welfare state see section 1.2 The construction of a milieu.

calculative and techno-bureaucratic techniques that aimed to manage, quantify, and monetarize the governmental operations following the business-like model of a private enterprise. In reality, these strategies and acts of government were to be decided and realized not by government, but by a multitude of centres of calculation transforming political decisions to technical ones\textsuperscript{367}.

The scientific redesign of the production processes relied on measuring outcomes based on a monetary rather than a social impact and allowed for the development of a calculative logic that promoted quantification and economic efficiency within the welfare state rather than envisioned specific improvements in people’s lives. This way, the public sector started to operate as an enterprise and to adjust to the performative demands of the market. In addition, the scientific expertise in Britain, although initially developed within the state, ultimately benefited the private sector, reinforcing capitalism rather than realizing socialism. The research developed by MiniTech during the 1960s but also by the other ministries relied on alliances (formed by research contracts) between large corporations and the state. This characterizes according to Miller a techno-corporate state\textsuperscript{368} and was a new politico-economic system that emerged from the scientific-military-industrial complex that was developed within the British postwar welfare state. Most of the technological research developed by the state was sooner or later taken over by independent enterprises. This was for example the case for most of the research in computer applications in the construction and architecture that although they were funded by the state, they circulated in the market by private enterprises. Similarly, the technical expertise that had become necessary to the practice of government had started to develop independently based on their own rules of operation, so it became eventually very easy to outsource them to private companies (when the cost of the state operations had to be shrunk). Moreover, following the positivist approach of separation between judgment of value and fact, decisions started to be justified, based on the impartiality of scientific objectivity\textsuperscript{369}.

\textsuperscript{367} Ibid.

\textsuperscript{368} Arthur Selwyn Miller, Toward the Techno-Corporate State, Villanova. Law Revie, Vol14, (1968), 1.

\textsuperscript{369} This is a non-cognitivist view according to which, ethical propositions do not express statements and thus cannot be true or false.
These practices and rationalities were eventually crystallized in the New Public Management\textsuperscript{370} practices put forward by Margaret Thatcher’s governments in the 1980s that prioritized economic efficiency and accountability in the public sector. In 1979 the Efficiency Unit was formed under the direction of the Marks & Spencer manager, Derek Rayner to perform economical scrutiny on the governmental operations. In parallel, the Piatzky Report that was published in 1980 underlined the large number of public bodies and proposed the abolition of some of them. Under this light, the civil service department was abolished in 1981 and its responsibilities were distributed in other departments. In 1982, the white paper on Efficiency and Effectiveness was published and the Financial Management Initiative was put forward requesting from civil servants at all levels to measure and securitize outputs, performance, and value of money as well as to pursue effectiveness through expertise\textsuperscript{371}. The practices of government started carrying the characteristics of an enterprise and the operations of the state to be based on managerial models of the private sector. As these managerial goals were not achieved by 1987 and aiming to a better value for money as an objective, the Next Steps Initiative proposed that the civil service needs to be reduced to a small group of policy makers, with other officials being transferred to work under free-standing agencies\textsuperscript{372}. In reality, the creation of the Next Steps Initiative opened the path to the eventual outsourcing and privatization of these services and departments.

After the elections of 1970, the Ministry of Technology was also incorporated into the new Department of Trade and Industry, which had a much more business driven rather than research or planning orientation. The same year, the Ministry of Public Buildings and Works dissolved\textsuperscript{373} too and many of its functions regarding the building and management of public buildings were outsourced to an external agent, the Property Service Agency (P.S.A.)\textsuperscript{374}, that was active from 1972 till 1993.


\textsuperscript{372} Paragraph 72, Public Service Committee Report, 1997-1998, House of Lords.

\textsuperscript{373} Only a part of its responsibilities was transferred to the Ministry of Environment.

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This was part of a general effort to limit the size of government. The P.S.A. was responsible to "provide, manage, maintain, and furnish the property used by the government, including defense establishments, offices, courts, research laboratories, training centres, and land"\textsuperscript{375}. In 1993 the P.S.A. was eventually privatized, and the management of the government properties was given to private companies. In 1992, the Private Finance Initiative (P.F.I.) introduced by the Conservative government, began to deliver public services by putting in use the financial mechanisms of the private sector. Private companies would start managing through competition contracts, public projects. P.F.I. companies undertook the construction, maintenance, and management of many the buildings of the public institutions; among them some of the government buildings of Whitehall. In order, for these private companies to achieve their contract profit goals, the construction quality and design of the buildings was compromised, while their management and maintenance would be poor. Eventually, many of these public buildings were sold to the private sector. Paradoxically, the state had in several cases to lease back these buildings from the private sector\textsuperscript{376}.

This way, the initial capacity of the post war welfare state to form policies, to plan the social and built environment, and to construct public buildings that would address the needs for welfare provisions had disappeared. The governmental machine was fragmented to smaller pieces and an extensive network of private-public entities was formed to replace the central state governmental bodies. The practice of government was managerialized and compartmentalized. Policy making was diffused from the state into external bodies. The government started relying on experts and independent agents. Thus, one could argue that since the late 1960s and more evidently since the 1980s there has been a transition from a (centralized state) government to a diffused form of governance. "Governance is seen as implying a move away from the previous government approach (a top-down legislative approach which attempts to regulate the behaviour of people and institutions in quite detailed and compartmentalized ways) to governance

\textsuperscript{375} The ministry dissolved in 1970.

\textsuperscript{376} For more details on this see "More managers than dreamers" in Sharr, Adam and Thornton, Stephen, Demolishing Whitehall, (London: Ashgate, 2013), 267-270.
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(which attempts to set the parameters of the system within which people and institutions behave so that self-regulation achieves the desired outcomes)\(^{377}\). Thus, governance extracts political power from the state and bestows it to private agents and interests\(^{378}\).

Although state government and bureaucracy have always been presented as the opposite to the market, Max Weber had already argued in the early 20\(^{th}\) century about the similarities between public bureaucracy with private enterprises. Ludwig von Mises on the other hand, in his book Bureaucracy\(^{379}\) distinguishes between two different ways of management, a bureaucratic and a profit based one. On this, he opposes Weber’s proposal that bureaucratic management is centered on economic calculations and carries a similar root for both private and public enterprises. In contrast, Mises considers that bureaucracy can only achieve social outcomes, that are politically subjective but, have no monetary objective value\(^{380}\). He considers efficiency in bureaucratic and profit management to be very different. “Within a bureaucracy, efficiency means subservience to the regulations, not to the consumer, and grants no harbor to deviation, innovation, or creativity...Business efficiency, on the other hand, depends upon economic calculation”\(^ {381}\). For Mises, only the market and profit output can be decisive measures of efficiency\(^ {382}\). David Graeber in his recent book The Utopia of the Rules, explains that in reality, state and government have historically made the market possible through military or government operations. Most importantly, Graeber demonstrates how markets create and need a


\(^{378}\) It is characteristic for example, that from the 1990s onwards through the process of the contracting out information-technology, the private sector overtook the state regarding the personal information it held and the expertise it developed regarding the analysis of data. Agar, Jon, The Government Machine, (Cambridge: M.I.T. Press, 2003), 373.


\(^{380}\) In this sense, Deleuze and Guattari understand bureaucracy as a form of anti-production that aims to decelerate capitalism and, in a way, to sustain its production circle agree with Von Mises idea that bureaucracy is necessary but destructive to capitalism.

\(^{381}\) Von Mises Ludwig, Bureaucracy (New Haven: Yale University Press, 1944), 18-19.

\(^{382}\) Von Mises’s ideas influenced the American neoliberalism and especially the writings of Friedrich Hayek that was his student.
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bureaucracy to exist. He names this the Iron Law of Liberalism, which "...states that any market reform, any government initiative intended to reduce red tape and promote market forces will have the ultimate effect of increasing the total number of regulations, the total amount of paperwork, and the total number of bureaucrats the government employs." So, in reality, he argues that markets do not regulate themselves, and require extensive administration in order to be formed and sustained. Taking the above into consideration, one can view the transition of the British welfare state and civil service from a bureaucratic to a scientific form of management during the late 1960s and 1970s as a way by which the governmental machine reformulated itself as an enterprise concentrating on issues of profit and market output. In parallel, as Graeber explains, through the gradual transfer of many of the operations of the state to the private domain and eventually to the individual, the model of the enterprise started to be cultivated within the private lives of individuals, who are transformed from social citizens of the welfare state with social and political rights to human enterprises with specific bureaucratic responsibilities of managing domains of their lives that in the past were in the care of the state. This way, risk, and responsibility are transferred from the state to the individual. This transformation took place through the expansion of the technocratic practices and rationalities both in the public and in the private lives of the individuals. Neoliberalism as envisioned by the tradition of the Austrian school of economics puts forward an enterprise society that operates beyond and in parallel to the market on the level of personal ideas, values, and culture. These ideas and rationalities are initially of technocratic character.

The philosophers of the Frankfurt School addressed the issue of the expansion of technical rationality within society and politics in diverse ways. Herbert Marcuse in his article Some Social Implications of Modern Technology (1941) and later in his book One-Dimensional Man: Studies in the Ideology of Advanced Industrial Society (1964), demonstrates how technical rationality has been utilized within capitalism as a productive and ideological force of control and

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domination. For Marcuse, not only technical reason, but technology itself is a
form of ideology and domination of the social ruling interests upon nature and
men. It has altered the practices of government and labour, but most
importantly, it has affected our sense of rationality. Rationality has transformed
from a critical force to one of adjustment and compliance to pre-given external
standards. Marcuse explains that: "This rationality establishes standards of
judgment and fosters attitudes which make men ready to accept the dictates of
the apparatus... Everything cooperates to turn human instincts, desires, and
thoughts into channels that feed the apparatus [...] The free economic subject
has developed into the object of large-scale organization and coordination, and
individual achievement has been transformed into standardized efficiency. The
latter is characterized by the fact that the individual's performance is motivated,
guided, and measured by standards external to him... The efficient individual is the
one whose performance is an action only insofar as it is the proper reaction to
the objective requirements of the apparatus, and his liberty is confined to the
selection of the most adequate means for reaching a goal which he did not set." Technological rationality becomes an instrument of administrative and
economic expediency, of profitable efficiency by quantifying qualitative features
and measuring individual performances, as well as an ideology that is an integral
part of one's sociocultural life and consciousness.

In the essays The Scientization of Politics and Public Opinion (1964) and
Technology and Science as Ideology (1968), which is a response to Marcuse's
previous analyses, Jurgen Habermas also addresses the issue of the effect of
science and technology upon society and politics. In contrast to Marcuse, he
considers that the essence of technology is not socially conditioned, but neutral
and his critique concentrates on the problem of the overdevelopment of
technical rationality and of the scientific thinking over other forms of language
and communicative actions. What he calls "the absorption of the institutional
framework of society (guided by social and cultural norms) by the sub-systems of

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He presents three distinct models through which science and politics can relate to each other, a decisionistic model of politics in which, politics dominate and are very little informed by science, a pragmatic model, which politics and science work together informing each other and finally, a technocratic model, in which political decisions are taken based on scientific criteria and experts become key political agents as they are responsible for them. The expansion of technological rationality into politics that is described in this last model started being realized in the late 1960s. It relies on the independence and objectivity of scientific knowledge, on the need for scientific assessment and technological expertise. These become the main justifications for the transposition of political decisions to scientists, technologists, and experts and for the elimination of the distinction between technical and political. This way, previously political matters are depoliticized, while important public tasks are outsourced to policy-experts. Hence the new ideology severs the criteria for justifying the organization of social life from any normative regulation of interaction, thus depoliticizing them. It anchors them instead in functions of a putative system of purposive-rational action.

This technocratic mentality permuted previously political decisions with technical and scientific ones, that were now delegated as specialized and limited tasks to experts; “political issues were restructured to conform to the requirements of technical decision.” This way, many political decisions were depoliticized “either by re-locating them as private matters to be resolved by individual market transactions, or by transforming them into technical, professional, or administrative matters to be resolved by the application of rational knowledge and professional expertise in relation to objective and apparently neutral criteria.” For Pierre Dardot and Christian Laval, it is exactly

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here that lies the great ideological victory of neoliberalism. They underline that “...neo-liberal policies were implemented in the name not of the ‘religion of the market’, but of the technical imperatives of management, in the name of the effectiveness, even ‘democratization’, of systems of government action”\textsuperscript{393}. Therefore, one could argue that during the 1960s a techno-bureaucracy emerged within the British welfare state, that carried neoliberal characteristics since it was based on principles of performativity, self-regulation, and competition that regarded both the state and the citizen as forms of enterprises that needed to operate according to such principles.

Through these initiatives, public servants were transformed to managers prioritizing efficiency, objectives, and value for money solutions rather than forming public policies (as Beveridge did in 1942). The measurement of individual performance, valuation, and self-control has become an imperative process of normalization aligning the political rationalities of neoliberalism with the regulation and management of the self as another form of enterprise\textsuperscript{394}. In parallel, the citizens started to be viewed as customers carrying the risk and responsibility for their choices. It becomes evident that by the 1980s responsibility has been transferred from the state as the representative body of society to the individual, either as a worker or a customer. The individuals became responsible for their choices and accountable for their effectiveness, efficiency, and performance. Thus, the calculative rationalities and practices of neoliberal technocracy eventually invaded all the aspects of one’s life and have installed technologies of government in the form of efficiency and performance criteria. It is a total techno-bureaucratization of life that has expanded through the imposition of calculative rationalities and practices beyond private enterprises to the state and eventually to the individual lives of people. In the following part, the thesis will examine how this was also realized in architectural design and production.


\textsuperscript{394} Performance based payment was initiated in December 1984 in the public sector.
3.5 The architecture of science at Cambridge University and the state-academic-industrial complex.

In this part, the thesis will examine how the rationalities and practices of technocracy also became part of architecture and affected the design and production of architecture in the welfare state. During the 1960s, the logic of scientification and technicization, which started prevailing the operations of the British welfare state, also became dominant within the discipline of architecture, affecting the design and production. The building programs of the welfare state that were by then focused on the construction of hospitals, universities, and offices, were based on scientific rationalization and research in regard to the use of space, the analysis of patterns, the arrangement of rooms and facilities, and planning considerations, the latter relying on information data. In fact, in the late 1960s, architecture in Britain tried to constitute itself as a science. Before we embark on this investigation, it is worth reflecting if briefly on the relation of architecture to science, as outlined by Antoine Picon. Picon discusses three major types of use of scientific references in architecture. In the first one, scientific knowledge is to convey an objective description of order though arithmetic and geometrical laws for example in the use of proportions. Another type of scientific reference in architecture is that of science as a metaphor or poetic inspiration, which he relates to the ways in which thought is organized around concepts that constitute imaginary social significations. Lastly, but most importantly, scientific methods and procedures have been used on many occasions to rationalize design processes. This is the case with the architectural research initiatives that were developed in the context of the welfare state and were supported by it.

The efforts of the scientification of architecture as a way of rationalizing design can be traced earlier in the 1940s. These efforts were part of a general designation of science as an essential factor of progress. For example, the Report

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on Scientific Manpower (Barlow report) (Fig. 3.35) that was published in 1946, linked the welfare of the nation to the exertion for scientific achievements. It stated: "Never before has the importance of science been more widely recognized or so many hopes of future progress and welfare founded upon the scientist... If we are to maintain our position in the world and restore and improve our standard of living, we have no alternative but to strive for that scientific achievement without which our trade will wither, our Colonial Empire will remain undeveloped and our lives and freedom will be at the mercy of a potential aggressor." In this context, architectural education too was affected by the strong belief in science and technology. Joan Ockman and Avigail Sachs, describing the postwar conditions in architectural education (merely in the USA, but also in Europe) underline that the postwar period could be characterized as "the dawn of the engineering age" since architectural education started to be directed towards the applications of science and technology instead of being preoccupied with philosophical or artistic inquiries. Such an influence was also evident in most social sciences and humanities and was partly the result of the war period when technology and science were employed for both national planning and military purposes. Most importantly, science and technology were considered essential in the reconstruction of the nation after the war and its economic progress. The large-scale planning and building programs of the British welfare state were materialized in their majority through the implementation of new technologies (especially prefabrication, standardization, and the use of new structural systems). This was the case for a large proportion of the building production in the period between the mid-nineteen forties till the late sixties. Architecture, aspiring to participate in these wider developments had not only to collaborate with other disciplines but also present itself as a realistic, practical, and technologically advantageous field. For this reason, architectural education in many universities at the time was positioned within the wider field of environmental design and the discipline of urban design. Thus, both architectural education and practice started during that period to adopt a positivistic approach.

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The architecture of science and the state-academic-industrial complex and employ scientific methodologies and extensive mathematical elaborations to justify and materialize their ideas.

Figure 3.35 – The Barlow report published in 1946.

The split between sciences and humanities in intellectual life that Charles P. Snow suggested in his Cambridge lecture on The Two Cultures (1959), was tilting
The architecture of science and the state-academic-industrial complex

in architecture towards the prominence of sciences. Three years earlier, in 1956, Leslie Martin left his position as a chief architect at the L.C.C. (1948-55) to take up the chair of the Cambridge architecture department. Martin, while in Cambridge, put his efforts into developing an architecture based on objective foundations and scientific methodologies that would lead to a new science of architectural form. This was partly an influence of the constructivist ideas of the beginning of the 20th century that called for a unity between science and art that Martin had expressed in the CIRCLE. According to Altino Joao Rocha, this was also an influence of the ideas of the physicist John Desmond Bernal that Martin had met and worked with. Desmond Bernal had published an article in the CIRCLE that proposed the fusion of arts and sciences. After the war, he was involved together with Martin at the Architectural Science Committee of the R.I.B.A., and in 1946 he presented a paper at R.I.B.A. entitled Science in Architecture. Martin in the 1958 R.I.B.A. Oxford Conference on Architectural Education presented some similar ideas suggesting that different types of knowledge should inform architectural education and research. This approach became evident in the research that Martin developed at Cambridge University in the following years.

The end of the war had also brought the invention of the first computer. The three lines of development that had grown from the early calculating machines, statistical machines, and logical automata converged to the invention of

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399 Martin was part of the 1937 publication CIRCLE that expressed these constructivist ideas for the first time in Britain. See footnote no.30. This was also an important influence in the design of the Whitehall plan. This is briefly discussed in section 3.2.


401 Eames, Charles and Ray, ed. Fleck, Glen, A Computer Perspective: Background to the Computer Age, (Cambridge: Harvard University Press, 1972. This publication by Charles and Ray Eames in 1971-72 was one of the first to examine the development of the computer from 1890 to 1950 and discuss its applications in architecture based on an exhibition they designed for I.B.M. More recent historical accounts of the evolution in the use and applications of computers in architecture and how they have affected the architectural design and practice have been given in several publications the last few years. More specifically in: Archeology of the Digital (2013), A Second Modernism (2013), Builders of the Vision: Software and the Imagination of Design (2015), When is the digital in architecture? (2017).
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E.N.I.A.C., the general electronic calculator that was used for ballistic calculations during the war. The first modern computer, the E.D.S.A.C., was constructed by Maurice Wilkes at the Cambridge University mathematical laboratory in 1949. Apart from the military, it was only the university departments of engineering and mathematics that were developing computer technology research at the time, especially at Cambridge University and M.I.T. In 1952, the first numerically controlled milling machine was developed at the Servomechanisms Laboratory at M.I.T., solving the problem of codifying machine movement by deriving point coordinates through drawing and calculating the movements of the machine. The concept and technologies of numerical control emerged from military U.S. Air Force sponsored research at M.I.T. labs “to improve the production of components for military components such as airplane wings.” The Computer Aided Design (C.A.D.) project was a research project between electrical and mechanical engineering departments led by Douglas Ross and Steve Coons that started in 1959. It was within this context, that Ivan Sutherland in 1963 as part of his Ph.D. thesis at M.I.T., invented the Sketchpad, the first computer graphic interaction software that is considered the predecessor of contemporary C.A.D. systems. Cardoso Llach underlines that it was actually the development of this first Computer Aided Manufacturing processes that gave rise to C.A.D. systems as these systems of man-machine graphical communication developed to facilitate the manufacturing process. The C.A.D. project was later put under the umbrella of Mathematics and Computation (M.A.C.) that expanded the research on graphic interfaces such as the S.A.G.E. (Semi Automated Ground Environment) and was sponsored by the U.S.’s government Advanced Research Project Agency (A.R.P.A.). This kind of research eventually, gave birth to the M.I.T. Laboratory of Computer Science and Artificial Intelligence that was formed in 1975 and to the Architecture Machine

402 Ibid.

403 These first-generation computers were based on vacuum tubes and batch processing and used machine code as the programming language. In the late 1950s vacuum tubes were replaced by transistors and the first commercial computers were made possible much smaller in size.

404 Although, it was initiated by the vice president of Parsons Corporation, John T. Parsons.

Group established by Nicholas Negroponte and Leon Groisser in 1967, later becoming the M.I.T. Media Lab.

In Britain, as we saw in the previous section, the efforts of modernization based on the use of scientific and technological knowledge were intensified in the 1960s and were common in the political programs of both the Conservative and the Labour Party during and after the war. Within the British government, a Department for Scientific and Industrial Research existed since 1915, and a Directorate General of Research and Development was established within the Ministry of Public Buildings and Works. The reform of the ministry in 1962 took away many of the authorities that the ministry had to plan and construct building projects, but the task of overseeing the construction industry became one of its new responsibilities. In 1963 an urgent need was expressed, and an initiative began to review the field of research in the construction industry and to establish an advisory body. The Robbins Report on Higher Education that was published the same year recommended the expansion of universities, the rise of university students, and open access to higher education based on meritocratic criteria. This was a response to the increased demand for higher education and the welfare state's policy to foreground equality of educational and work opportunities. This strategy expressed a clear political will for the expansion of technological research for market purposes within the universities and for an increase in the training of experts and white-collar workers, that needed to address the demands of the changing economy. Indeed, the British economy from the 1960s onwards started to be directed towards the informational and communicational services based on new technologies rather than on heavy

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406 Negroponte had taken classes on analytical geometry by Steve Coons, who also co-advised his thesis.

407 The department existed in British government from 1915 till 1965, when its responsibilities were resumed by the Ministry of Technology.

408 This is the ministry that through the centuries was responsible for the government building projects and that initiated the construction of most of the buildings at Whitehall, was the Ministry of Works that was established in 1378 as Office of Works and named Ministry of Works and Buildings in 1940, playing a significant role in the reconstruction of Britain after the war. In 1962, it was renamed Ministry of Public Buildings and Works (M.P.B.W.) and became also responsible of overseeing the construction industry.

409 See archival document 1 (AD1) in the appendix. From National Archives Work 78/176 or RC 51151.
industry and manufacturing\textsuperscript{410}. The change of government in October 1964 and the establishment of the new Ministry of Technology intensified the efforts for the expansion of research in the construction industry especially, regarding the use and application of the new technology of the electronic computer. These efforts were aligned with the objectives set by the National Plan of 1965. The same year, and after a series of meetings, an official paper was produced by the M.P.B.W., defining the main uses of computers in the construction industry as those of research (by universities and associations), design, production, accountancy, and communication. The design applications of computers at the time consisted in the practical use of computers for structural and other calculations (for example in the optimization of works), the use of computable models as an aid to design analysis or testing alternative solutions (for example regarding space allocation) and computers used in conjunction to operational research and statistical survey to analyze users requirements and assess the performance of buildings as well as cost planning, rationalization, and standardization of building processes\textsuperscript{411}. There were between three to four hundred computers in Britain at the time from which only ten to fifteen were within the construction industry. Since the industry could profit from making wider use of the computers, the M.P.B.W. paper expressed the need for the formation of a body to carry out relevant and focused studies and to guide these developments. Thus, the launch of preliminary studies by specialists and industrial consultants was proposed\textsuperscript{412}. Government departments, local authorities, universities, professional institutions and practices, research associations, and large contractors were to be involved in this initiative. In May 1966, the Directorate General of Research and Development of the M.P.B.W. established the Committee on the Application of Computers in the Construction Industry (Fig.3.36 - AD5)\textsuperscript{413} in order to coordinate the research and activities of

\textsuperscript{410} For many analysts, during this period the transition from industrial to post-industrial economy took place. This involved changes in the quality and nature of labour, from material to immaterial labour, turning many blue-collar workers that produce material commodities to white-collar workers that would produce the informational or affective content of commodities. For a further analysis on this see; Hardt, Michael and Negri, Antonio. ‘Postmodernization or The Informatization of Production’. Empire, (Cambridge, MA: Harvard University Press, 2001), 280-304.

\textsuperscript{411} See archival document 2 (AD2) in the appendix. From National Archives Works 78/ 112 & 78/ 113.

\textsuperscript{412} See archival document 3 & 4 (AD3 & AD4) in the appendix. From National Archives Works 78/ 112 & 78/ 113.

\textsuperscript{413} See archival document 5 (AD5) in the appendix. From National Archives Works 78/ 112 & 78/ 113.
the use of computers in the different sectors of the construction industry. One of the aims of the committee was to study Computer Aided Architectural Design (C.A.A.D.) and for this purpose, it formed three working groups dedicated to the production of working drawings, the development of systematic and mathematical methods in solving design problems using appraisal, optimization, simulation techniques and finally to heuristic programming with the use of computer design languages. The committee aimed to promote the use of computers in the construction industry although, the financial limitations for the small firms were recognized. As an alternative, it proposed the initial use of computer centres established in different regions and the education of professionals. The Ministry of Technology established in 1969 in Cambridge among other places a Computer Aided Design Centre. It was linked to the University of Cambridge and carried many of its computing requests. In parallel, the Ministry offered a series of grants and research contracts to universities, institutions, and consultants to conduct related studies. There were at least thirty-eight contracts offered between 1965 and 1969 by the Directorate of Research and Information of the M.P.B.W. (Fig.3.37). This way the state promoted and sustained the research for the modernization of the construction industry.

414 See archival document 6 (AD6) in the appendix. From National Archives Work 78/135.
415 The centre operated till 1983.
416 See archival document 7 (AD7) in the appendix. From National Archives Work 78/161/1.
Image removed for copyright reasons.

Fig.3.36 - Proposal for the formation of the Committee on the Application of Computers in the Construction Industry (May 1966).
Many of the projects of this initiative were related to programs of the welfare state. The research on the government buildings and offices produced for the Whitehall plan that we examined in the previous part, was one of the initial projects that were included in this initiative. In August 1966, there was a meeting with Leslie Martin at the M.P.B.W. Martin explained the work that Cambridge University had developed for the Whitehall scheme regarding the techniques that could help an architect to assess the results of interplaying and varying factors in the setting of a building of a given total area, on a site of a given area, mainly in regards to patterns to be adopted. Many ranges of choices could be taken into consideration such as grid dimensions, spans, and divisions within a building. Martin underlined that “further development of these techniques with the employment of a computer, would enable an architect to bring together a multiplicity of factors and to reach conclusions on the basis of a rational appraisal of the relationships between wide ranges of alternative solutions”⁴¹⁷. Initially,

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⁴¹⁷ Note on the meeting of Tuesday 9th of August 1966 – Archival document 8 (AD8), From National Archives Work 78/161/1
these techniques were to be tested on Whitehall (Bridge offices) scheme using the computer of the quantity surveyors Monk and Dunstone, while later by employing the new Titan Atlas computer that the school of engineering was about to acquire\textsuperscript{418}. Martin on behalf of the department of architecture of the University of Cambridge requested a grant by both M.P.B.W. and MiniTech to employ initially one expert on computers as a director of studies and later to expand the team to six to eight people on a research project that could span over three years. The University’s contribution would be the services of Professor Leslie Martin and Lionel March, the accommodation, and the use of the Atlas computer with the collaboration of the school of engineering\textsuperscript{419}. The grant given to the University of Cambridge in March 1967 was to be the largest offered by the Directorate of Research & Information at the time\textsuperscript{420} (Fig.3.38). Another resource from which research grants were secured, in order to develop research on urban studies, was the Centre of Environmental Studies, which was formed in 1967 by the Wilson government to promote environmental research and was partly funded by the Ford Foundation\textsuperscript{421}. The Ford Foundation would at the time also fund a big part of the urban, environmental, and computer research taking place at M.I.T. The Centre funded research on environmental urban studies mainly through contract grants.

To develop the research and work for this and a couple of other research projects the Land Use and Building Form Studies centre (L.U.B.F.S) was established at the Department of Architecture at Cambridge University in October 1967. Some of its principal figures were Leslie Martin, Lionel March that both served as its directors, Dean Hawkes, Phillip Steadman, Marcial Echenique, and Nicholas Bullock among others. L.U.B.F.S. centre turned into the Martin Centre for Architectural and Urban Studies in 1974 and expanded its research objectives. The centre was involved for the first three years (1967-70) in three major research projects; the Office Study, initiated by the Whitehall project and sponsored by the M.P.B.W., the University Study sponsored by the Ministry of

\textsuperscript{418} An small Elliot 803 computer.

\textsuperscript{419} See archival document 9 (AD9). From National Archives Work 78/161/1.

\textsuperscript{420} See archival document 10 (AD10). From National Archives Work 78/161/1.

\textsuperscript{421} See archival document 11 (AD11). From National Archives Work 78/161/2.
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Education and the Urban Systems Study funded by the Centre of Environmental Studies. It is important to underline here, that the research was derived from projects of the welfare state and investigated issues of building typology, form, and construction that would be employed in the architecture of buildings such as government offices, public universities, and housing. All the studies were related to the use of land by buildings employing mainly quantitative methods that examined possible patterns and solutions. In the introduction of the Architectural Design magazine of May 1971 (Fig.3.39) that was co-edited by Lionel March, Peter Dickens, and Marcial Echenique, the practices and concerns of the L.U.B.F.S. centre are stated in detail. Architecture and in this specific case, the architecture (of the welfare state) in the 1960s is to find adequate theoretical foundations in mathematical methods and be based on a new awareness of systems and structures.
Image removed for copyright reasons.

Fig.3.38 - The research contract between the architectural department of the University of Cambridge and the Directorate of Research and Innovation of the M.P.B.W.
The work of the centre was characterized by its initiators as scientific and consisted of creating mathematical models that would take into consideration diverse requirements and information to generate the physical form of buildings and urban areas. They would analyze them using behavioural simulations and patterns of activities, measuring and evaluating the performance of the different designs. This kind of research had begun with the Whitehall plan, where floor space needs and density requirements were described in mathematical terms and diverse building forms were explored using computer techniques.\textsuperscript{422} In the

\begin{footnotesize}
\textsuperscript{422} See archival documents 12- 15 (AD12-AD15). From National Archives Work 78/ 161/2.
\end{footnotesize}
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Whitehall study, the arrangement of the tower street, and courtyard forms were scrutinized. This process that involved gathering information, forming mathematical models that presented the diverse properties, analyzing, and experimenting with them through the use of computers, allowed for the evaluation of the different results. This is a process of analysis, decision making, and synthesis in which measurement, analysis, and rationalization play an important role\textsuperscript{423}. There was an integration of planning and building science through the representation of the relationships between the use of land and the built form. In addition, in many of these research projects, a behavioural simulation that would include users’ studies would help evaluate the architectural forms following different behavioural scenarios, while the environmental performance or other performance demands of the building would also be considered.

An extensive bibliography on the topic characterizes these architectural practices as constituting an architecture of science\textsuperscript{424}. Kenneth Frampton in his text The mutual limits of architecture and science underlines that the work produced in the L.U.B.F.S. centre is an “effort to reconstitute architecture as an applied science”\textsuperscript{425} and considers it together with other similar efforts such as the work of the Ulm School of Design (Hochschule für Gestaltung Ulm) in the 1950s and the earlier studies of Hannes Meyer. More specifically, Adam Sharr and Stephen Thornton in Demolishing Whitehall analyze the work of the L.U.B.F.S. centre in relation to the rise of the modern scientific university and the pursuit of a science of architectural form within the wider frame of city planning\textsuperscript{426}. Antoine Picon, on the other hand, positions it within the history of digital architecture, underlying its importance regarding both code writing and the use of computers in architecture. He considers that this kind of work should make us

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\textsuperscript{423} According to Joan Ockman this form of thinking carries a military logic; information is gathered, analyzed, clarified, compared, evaluated in order for the optimal solution to be provided.

\textsuperscript{424} Lionel March would distinguish between architectural engineering and architectural science considering the second a wider problem of design methodology.

\textsuperscript{425} Frampton, Kenneth, “The mutual limits of architecture and science” in Galison, Peter and Thompson Emily eds., The Architecture of Science (Cambridge: M.I.T. Press, 1999), 353-375

The architecture of science and the state-academic-industrial complex rethink the emergence of postmodernism as not only an aesthetic phenomenon but as one that was formed by these new ways of thinking and working. Altino Rocha in his doctoral thesis Architecture Theory 1960-1980, Emergence of a Computational Perspective provides an extensive presentation of the work developed in the L.U.B.F.S. centre as well as three other research institutions and he also positions it within the emergence of computational architecture in the late 1960s. Rocha proposes that this research needs to be understood as part of the structuralist revolution of the time, which in his opinion took both the form of architecture as a sign, and the form of information as mathematization and pattern formation. Though the work produced at L.U.B.F.S. centre does carry structuralist influences, its primary preoccupation is, the thesis argues, the development of a scientific method of design whether the latter was realized through the use of computers or other techniques of calculation. Therefore, it is useful to focus on these aspects, and especially on their implications in architecture.

The rigorous quantification and mathematization, two of the main characteristics of the research at L.U.B.F.S. centre, aimed to provide among other a common language with other fields and practices such as computer science, economics, administration, and geography. This inclination toward mathematical methods is considered by Andre Witt as “the quantification turn” in architectural design. For Witt, this tendency towards mathematization and quantification was an integral part of the architectural design before the actual development of digital tools and signals an evolution in disciplinary thinking. This evolution as the thesis demonstrates is not independent of the political and social context of the postwar period and its demands. Two mathematical tools employed in these mathematical explorations were set theory and Boolean algebra. Information data and design requirements would be quantified, building forms would be described using the true/false binary system of Boolean algebra (Fig. 3.40) and

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429 Witt, Andrew, “Networks and the Quantification Turn” in When is the digital in architecture?, (Berlin: Sternberg Press, 2017).
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set theory analysis would schematize the underlying relations of forms and data. These representations (modelings) of architecture in algebraic mathematical forms and sets; presented a schematic version of reality but were more easily calculated by computers. Hence, computation and modeling through formulas, graphs, diagrams, and codes started replacing drawings, sketches, or physical models.

Fig. 3.40 - The Seagram building’s form expressed in Boolean algebra by Lionel March.
Architectural design was then to be defined programmatically based on data processing and performance evaluation. As the process was to be rationalized rather than relying on the arbitrariness of concept or intuition, the subjects (users) and the objects (building outcomes) of the design would relate to each other through a systematic process that aspired to be neutral. This method of primarily setting and solving architectural problems through a step by step procedure was also characteristic of the work of Christopher Alexander, Cambridge graduate who like Lionel March had studied mathematics, and both had pursued their Ph.D. research at the Harvard – M.I.T. Joint Centre for Urban Studies and were particularly influenced by the scientific research that took place there. Alexander published in 1964 the Notes on the Synthesis of Form, where he describes the process of design through specific stages of analysis and synthesis which follow, and to an extent, determine logical patterns and relations between entities. A couple of years before, he had participated in the first Conference on Design Methods that took place in London (Fig. 3.41). The Design Methods Movement proposed the use of methods that break to pieces any design problem and solve it to achieve an optimal result that would fit in the best possible way the set requirements. Design Methods were heavily influenced by organization and methods management as well as from operation research techniques, which as discussed in previous parts, were practices that became essential to the management of the British state. Although the research that took place at L.U.B.F.S. centre differentiates from the techniques used in design methods, mainly in the ambition of the latter to achieve an optimal architectural solution, they both carry a common scientific rigorousness in their processes. That said, Lionel March had expressed his criticism of Alexander’s methods. As an alternative, he proposed in The logic of design and the question of value, his own design methodology that would allow for the unforeseen parameters of the design process to be included through a cyclical evolutionary design process of induction deduction and production, of which architectural form would be the end result (Fig. 3.42).

Fig. 3.41. The first Conference on Design Methods took place in London in 1962 with the participation of Christopher Alexander.

Fig. 3.42. The processes of induction, deduction and production proposed by Lionel March.
Sean Keller in his Ph.D. thesis and in later publications considers that the work of Lionel March produced at the L.U.B.F.S. centre together with that of Christopher Alexander did indeed attempt to “apply mathematics and computation to the analysis of architectural problems in the hope of formulating a scientific method of design that could proceed (semi)-automatically from data-needs, costs, site conditions, material properties – to design”\(^{431}\). He positions their work together with that of Frei Otto and Peter Eisenman, who had also developed his Ph.D. thesis\(^{432}\) at Cambridge University in 1963. The work of these architects although it differentiates significantly\(^{433}\) constitutes according to Keller an attempt “to propose a design method that would be rigorous, well-regulated and objective, that would be in some significant sense, automatic.”\(^{434}\) These design strategies being syntactic, anti-semantic, and iconoclastic attempted to overcome the problem of authorship and meaning in architecture. With their underlying systems and forms, captured in mathematical formulas, they could be considered as systems aesthetics\(^{435}\) that would operate beyond the invention of images and appearances, based on deep mathematical relations and processes.

Philip Steadman, one of the main researchers at L.U.B.F.S. centre, in a recent account of the research that took place in Cambridge, responds to Keller’s argument clarifying a lot of the aspects and premises of the work at L.U.B.F.S. centre\(^{436}\). He underlines that the intention was not to mechanize or make automatic the design process and that the processes differentiated significantly from those of Design Methods. Instead, the aim was to support architectural design with science and provide a method through which a range of choices could


\(^{433}\) Lionel March’s and Christopher Alexander’s work being data-driven, while Eisenman’s more linguistic and neo-platonic, while Otto’s relying on natural models and form-finding strategies.

\(^{434}\) Keller, Sean, Automatic Architecture: Motivating form after modernism, 2.

\(^{435}\) The term was initially used by Lionel March (1972) and analyzed by Keller, Sean in his Ph.D. thesis, Systems aesthetics: architectural theory at the University of Cambridge, 1960--1975, (Harvard University, 2005).

be examined and considered. Indeed, the methodologies employed in L.U.B.F.S. centre did not aim to automatize the architectural design process, and this is something that comes across in the writings of both Leslie Martin and Lionel March. Rather the research aspired to play a consulting role in the design process. Steadman claims that these studies had a didactic purpose, however, and this is what is mainly of interest to this research, the studies did present architecture through calculable formulas and representations that were reductive, quantifiable, and abstract. These processes as Keller rightly points out would “naturalize design: to shift architectural design from the realm of culture and politics to the realm of objective fact”\textsuperscript{437}. This reliance upon objective facts and scientific methods aimed to legitimize the architectural design process and justify its premises to external entities (the industry, the state, the private clients) that considered science and technology as the bases of economic development.

By presenting itself as a hard rather than a soft science architectural research in the late 1960s, aimed to connect directly to industry and the market. Most importantly, by producing calculable and quantifiable results and presenting clear scientific methods of work, architectural production could be both understood and managed in economic and operational terms. Moreover, by addressing issues of performance and optimization, architectural designs could be evaluated, assessed, and shaped as the input and output of quantity surveys and operational processes taking into account construction costs, occupation, labour conditions, and contracts. The measures and processes of these evaluations were eventually to be determined by the market. The marketability of the architectural product, its ability to raise investments, or satisfy user and client needs could be justified by its quantified characteristics and effects. Architecture by presenting itself as science and by using scientific methods and complex calculative practices aimed to be legitimized as a discipline that is able to solve problems and provide answers to wider social problems. By framing the architectural practices in this way, it was possible to attract funding for research and to be included in the decision-making processes especially regarding the planning of the urban environment. As Keller explains “mathematics and computer science would give architecture not just a sound epistemological base

\textsuperscript{437} Keller, Sean, Automatic Architecture: Motivating form after modernism, 5.
but greater practical standing [...] Architecture would be reconstructed as a serious business with a legitimate, and fundable, role for advanced research.438

A series of initiatives were taken to disseminate the work produced by the L.U.B.F.S. centre to the private and public domain through seminars, conferences, and publications. These efforts also aimed to form larger and better coordinated data research structures, with the participation and collaboration of industry partners, associations, and firms. A letter by the ministry to Lionel March in 1969 underlined that it was important that not only the results of the centre’s work but also the techniques and methods involved to be made available to the wider industry.439 Applied Research of Cambridge (A.R.C.) Ltd. was formed in August 1969 by some of the members of the L.U.B.F.S. centre. The company was directed by a board formed by Lionel March, Dean Hawkes, Kevin O’Sullivan, and the lawyer Peter Soar, while its equal shareholders were members of the L.U.B.F.S. centre. The work carried out by the company was not research, but commercially oriented. The computer applications that it offered, involved the computing of urban forms and layouts for housing and hospitals, traffic prediction and transportation planning as well as the environmental evaluation of buildings. The company targeted to set up computer aided systems, urban models, and data banks for ministries, local authorities, and town development corporations440 so, for the main authorities and agents of the welfare state. One of the major clients of A.R.C. was the Ministry of Housing and Local Government (M.H.L.G.) for which it tested different solutions for housing layouts. The company eventually started selling similar applications to private clients. Issues of ownership and payment of royalties for these applications were raised as they had been developed through state research contracts on projects of the welfare state (government offices and public universities and housing), offered by the M.P.B.W., M.H.L.G. or MiniTech and carried out by the University of Cambridge (L.U.B.F.S. centre)441. Their marketing and commercial exploitation, however, was undertaken by private


439 See archival document 16 (AD16). From National Archives Work 78/161/2.

440 See archival documents 17 & 18 (AD17 & AD18). From National Archives Work 78/161/2.

441 See archival documents 19 & 20 (AD19 & AD20). From National Archives Work 78/161/2.
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cOMPANYs such as A.R.C. Ltd. forming a complex network between state and
corporations, between academia and industry. In 1978 another company for the
commercial use of MEPLAN software, which simulated the land use/transport
relations, was established by Marcial Echenique, another member of the L.U.B.F.S.
team. In 1984, McDonnell Douglas Corporation, one of the first major C.A.D.
software vendors, acquired A.R.C.\textsuperscript{442}. Cambridge Architectural Research (C.A.R.)
Ltd. was also formed in 1987 by researchers from the Martin Centre (previously
L.U.B.F.S.) as an independent consultancy to provide specialist advice and
connect academic research to architectural practice.

These entrepreneurial initiatives exist within the development of what came to
be known as the Cambridge phenomenon\textsuperscript{443} a term first used by Peta Levi in a
Financial Times article in November 1980 to describe the explosion of
technology, life sciences, and service companies that occurred in the city of
Cambridge since 1960 and in fact lasts till today (Fig.3.43). The Cambridge
Science Park was founded in 1970 by the Trinity College to host science and
technology related businesses and the area has been referred to as the Silicon
Fen. This cluster of businesses formed by the commercial satellite companies
marketized research which was developed in the labs and research centres of the
University of Cambridge. As Tim Eiloart and David Southward, the founders of
Cambridge Consultants have underlined, these companies “put the brains of
Cambridge University at the disposal of the problems of British industry”\textsuperscript{444}. A
publication in 2012, The Cambridge Phenomenon celebrated the fifty years of this
phenomenon and was forwarded by Bill Gates, the founder of Microsoft\textsuperscript{445}.

These entrepreneurial phenomena need to be considered as the results of a
state-academic-industrial complex that had been initiated during the war and
developed in the post-war period through the expansion and support of the

\textsuperscript{442} Rocha, Altino Joao Magalhaes, Architecture Theory 1960-1980. Emergence of a Computational

\textsuperscript{443} Wicksteed, Segal Quince, The Cambridge phenomenon: the growth of high technology industry

\textsuperscript{444} \url{https://www.cambridgeconsultants.com/about-us}, accessed 19\textsuperscript{th} of June 2019.

\textsuperscript{445} See: Kirk, Kate, The Cambridge Phenomenon: 50 Years of Innovation & Enterprise, (London, Third
Millennium: 2012).
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welfare state. A large amount of funding for research would be directed by
governments, and military to the universities. Apart from Cambridge University,
which we examined in detail, this was also the case for other universities in Britain
and the USA. The M.I.T. for example, as we saw at the beginning of this part
developed extensive research on computer science and its applications in design
and the urban environment, sponsored by the American military, I.B.M., the Ford
Foundation and Parsons Corporation among other agents. Mary Louise Lobsinger
in Two Cambridges: Models, Methods, Systems, and Expertise draws an interesting
parallel between the post-war development of research at Cambridge University
and M.I.T.446. She identifies both of them as institutions with expertise in science
and technology that collaborated with the industry and the government on
research. The results of the research were initially to provide practical solutions
and technological innovations for the war and later for the technologically
growing post-war welfare state societies that aimed to boost their economies
through technological and scientific research.

Although the boundaries of these complexes are hard to define, the relationship
between private enterprise and government interests in the funding, purpose,
and use of these research projects is interesting to untangle. The private sector
has often relied on research developed in the universities and the state to test
technological innovations or invent new products and methods of practice.
Lobsinger notes that these complexes resulted in “a technological transfer with
public and political enterprise” and indeed there was an explicit transfer of
knowledge and technology through these initiatives, from the public to the
private sector. In addition, the entrepreneurial risk of innovation although taken
by the state would eventually benefit the operations of the market. This way, one
could note that the state by funding the research in universities, indirectly
supported the expansion of the market and the development of innovative
technologies and practices within it. In parallel, it nurtured a market oriented
entrepreneurial attitude in research and education, often taking itself the role of
the entrepreneur. This is what the economist Mariana Mazzucato names as the

446 Lobsinger, Mary Louise, “Two Cambridges: Models, Methods, Systems, and Expertise”, A Second
entrepreneurial state. The state through the funding of research indirectly intervened in the market in order to promote entrepreneurship through technological innovation. In this sense, it played the role of the enabler not in micro, but rather in a macro level by promoting the research in specific industries. It would indirectly intervene in the factors of economic development in order to assure the growth of the market. Nevertheless, the profits of these enterprises were to be collected by the shareholders of the companies rather than the citizens of the state. However, as the economist Milton Friedman has claimed, the purpose of a company is the increase in its profit, and it carries no responsibility to the public or society. Taking this into consideration, one is led to question the purpose of these research initiatives regarding the benefits they provided primarily to consumers and entrepreneurs rather than towards each of the citizens of the welfare state and their wellbeing. The benefits of these efforts were mainly economic rather than social, but they were not equally distributed or returned to the citizens. One could also argue that these practices by opening up the universities to market purposes and orienting the academic research toward market applications, transformed the universities from institutions for the acquiring and pursue of knowledge to nodes in larger networks of entrepreneurship in the service of the private profit. This way, these projects contributed to distributing agency from the state to the individual and the market. Finally, and most importantly, we need to consider the way these practices oriented the architectural thinking and production towards performance and efficiency demands that depend on economic rather than social factors of welfare. These issues are to be examined in the next and final part of this section in order to demonstrate how the politics of calculations facilitated the transition from an architecture of science that was developed

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447 Mazzucato in the homonymous book exposed how in reality it has been governments and not private companies that have funded and been the source of the most radical innovations and technologies by undertaking the entrepreneurial risk that private initiatives would avoid as not profit secure. “Unlike in a developing economy, where the technology is already available elsewhere in the world, an entrepreneurial state does not yet know what the details of the innovation are, but it knows a general area that is ripe for development, or where pushing the boundaries of knowledge are desirable. The state welcomes and engages with Knightian uncertainty for the exploration and production of new products which lead to economic growth.” Mazzucato, Mariana, The Entrepreneurial State, (London: Anthem Press: 2013).

Also see: Le Texier, Thibault “L’État une entreprise manageriale?” in Le maniement des hommes, (Paris: La Decouverte: 2016).

The architecture of science and the state-academic-industrial complex within the welfare state to an architecture of (neoliberal) technocracy that would eventually undermine the architectural production of the welfare state.

Fig. 3.43-The Cambridge Phenomenon explained by Segal Quince Wicksteed in his homonymous book.
3.6 The politics of calculations: from the architecture of science to the architecture of neoliberal technocracy.

In order to demonstrate how the architecture of science mutated into an architecture of technocracy, the thesis will need to examine the practices and politics of calculations in their detail and note their alterations. The calculative practices in architecture originate from the very beginning of the practice. The traditional arithmetic and geometric tools employed by engineers and architects always included forms of counting and measurement. They merely relied on the use of proportions and their rules of application. These rules were based on conventions of appropriateness. The shift from geometry to numeracy in architectural design is located according to Mario Carpo in the Renaissance theory and practices. These practices were challenged further with the expansion of scientific knowledge and the use of new forms of calculations (such as the calculus), while significant changes took place after the Enlightenment through the application of more complex mathematics. This is for example evident in the work of Claude Perrault regarding the use of positive (universal) and arbitrary proportions. Indeed, Alan Colquhoun, underlines that rationalism has been prevalent in architecture from Enlightenment onwards. He traces its history in architecture in his essay Rationalism: a Philosophical Concept in Architecture and provides a general definition of rationalism in architecture, as an architecture that is "the result of the application of general rules, established by the operation of reason". The spread of calculative practices in architecture should be considered in the light of these historical processes,


450 Alberto Pérez-Gómez in Architecture and the Crisis of Modern Science (Cambridge: M.I.T. Press, 1983) provides an in depth account of how architecture was profoundly altered by the scientific revolution.

451 For, example with the Introduction to Analysis of the Infinite by Leonhard Euler (1748).

452 See: Perrault, Claude, Ordonnance des cinq espèces de colonnes selon la méthode des Anciens (1683), https://archive.org/details/ordonnancedescin00perr/page/n17

The greater use of calculative logic in architecture was facilitated by the increasing autonomy of scientific thinking, which once separated from metaphysics and human values could have further applications. In 1797, the Réflexions sur la Métaphysique du Calcul by Lazare Carnot, by proving the self-efficiency of the infinitesimal calculus, established for the first time the idea that technical and scientific actions could be separated from human values and be applied to any discipline. Joseph-Louis Lagrange’s Mécanique Analytique (1788) was the first treatise on mechanics that developed the solution of specific problems to general formulas that could apply to different problems and therefore was transferable. Thus, by the late eighteenth century mathematical and scientific principles became autonomous and applicable to different disciplines.

That facilitated efforts to introduce methods of calculations that were based on scientific knowledge and accuracy in engineering and architecture. Following on the application of quantification and mathematization in engineering and architecture. Great attention was drawn to analysis, to the methodical decomposition of the dynamic problems of nature, machines, buildings, engineering, economy, and even society into distinct elementary parts and operations and their re-composition into complex entities and processes. It is this kind of analysis that engineers employed into construction processes that also led to a systematic analysis of architecture as put forward by Jean Nicolas Durand in the Précis des leçons d’architecture données à l’École Polytechnique in the early nineteenth century. This analytical approach was applied in many diverse fields from science and engineering, to economy, philosophy, and history. It carried a clear scientific character and introduced a rationalization that was later also employed in government and economy in the form of scientific management and Taylorism. In fact, the method provided a common system and continuity among different disciplines, especially between


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engineering, government administration, and economy. In parallel, it put forward a rationalism that would erase any form of prejudice and instead foreground problems of utility and efficiency.

Efficiency in the building following the Vitruvian tradition had been related till then to the appropriateness of proportions. In eighteenth-century science, engineering, economy, and government turned towards the dynamism of nature and movement to exemplify efficiency. Engineers with the use of calculus could define the dynamic flows and movements in nature, goods, materials, vehicles, people, and attempt to regulate them. At the same time, as we saw at the beginning of the thesis (2.1) the physiocrats or les économistes as they were called, exemplified the “laissez-faire” approach regarding the government of economic activities, proposing that natural laws should prescribe them. While scientists sought to define natural laws, engineers attempted to imitate and regulate them, economists to foreground them in the operations of the market and society. This way, engineers and architects were not focused on the truth of natural laws as scientists did, rather on using, adapting, and regulating nature towards social orders and needs. Engineers and architects looked for the utility of natural laws rather than their objective truth. It is important to distinguish between objectivity and efficiency. Antoine Picon very clearly underlines that: “The scope of calculation is different depending on whether the aim is objectivity or efficiency. Data and mathematical tools are treated more instrumentally in the second case than in the first. It is well known that the first quality of an engineering formula is to ‘work’ rather than to be scientifically accurate.” Therefore, calculations in engineering and architecture directed towards efficiency to serve the solution of problems that are externally defined rather than the internal truth of scientific laws.

In the previous part, we examined how the architectural practice and research had started during and after the second world war to rely more extensively on

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458 This signals the beginning of liberal forms of government which are accompanied by the formation of apparatuses of security.

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sciences and calculations in order to address and solve diverse needs and problems. The architecture of science, as it was characterized, was developed in Cambridge University and in other places during the 1960s and 1970s, carried exactly this logic of problem solving. The architectural practice started to develop calculative rationalities and methods that would contribute to scientifically justified decisions regarding the form, use, and production of architecture. Architecture was represented mathematically through statistics, formulas, and algorithms. It was calculated, simulated and modeled through computers and required an increased technical aptitude. This way, it became part of an overall epistemological transformation of the studies of the built environment towards quantification and scientification.

To understand the effects of these methods, we will need to look into the processes of calculations and examine what they actually do and most importantly, to analyze the rationalities they develop. Calculations as we described in part three (3.3), have the ability, first of all, to count and quantify (definition 1). They abstract the qualitative characteristics of things and represent them through numbers or other signs. One of the definitions of mathematics, for example, is that of “the abstract science of number, quantity, and space, either as abstract concepts (pure mathematics) or as applied to other disciplines such as physics and engineering (applied mathematics)”⁴⁶⁰. In this case, we examine the second ones. Quantification also provides the object of measurement and evaluation of things. Calculations connect entities between them, forming relations and links between diverse entities that become dependable and interrelated (definition 2). They dictate the rules and conditions of these relations through equations and formulas that can be manipulated and optimized. Finally, calculations have the ability to capture changes and dynamic processes, to adapt to limits and predict future outcomes (definition 3).

The architecture of science, through the mathematization of architectural form and the quantification of architectural properties, started transforming architecture into a set of calculable data. It put forward an act of counting and measuring that presents architecture and its experience through quantities. Space occupation, lighting, materiality, connectivity, and many other parameters, are presented through numbers that are possible to be included in

calculations. This way, architecture, its properties, and experiences, are abstracted from their qualitative characteristics and presented as quantities that could be measured. One could say that these quantities indirectly reflected aspects of the designed architecture, however, this form of representation could not but be one-dimensional, communicating only specific aspects, while excluding qualities that are not measurable. Architecture by being stripped from its qualitative characteristics is emptied in many respects from its capacity to signify and delineate experience; to incorporate semantics beyond syntactics. This is a function that has been essential in the formation of the social role of institutional architecture throughout history.

Moreover, when the parameters of design and are explicitly defined through numbers, the outcome can be easily turned into a commodity. Marx defines a commodity as "an external object, a thing which through its qualities satisfies human needs of whatever kind"461. "Every useful thing may be looked at from two points of view of quality and of quantity"462, he adds. So, architecture through its ability to satisfy human needs in an explicit and measurable way is addressed as a commodity. Nevertheless, commodities carry a use-value and an exchange value. The use-value of a thing is related to its usefulness that is constituted by its qualities and conditioned by its physical properties. One could propose that the use-value of an architecture exceeds functionality and includes all the qualities produced by its material and immaterial properties. Commodities, however, as objects that can be sold on the market, hold also an exchange-value, which is the foundation upon which their value in money in the form of price, is determined. Marx clarifies that "as use values commodities differ in quality, while as exchange-values they can only differ in quantity [...] Exchange value appears first of all as the quantitative relation, the proportion, in which use-values of one kind exchange for use-values of another kind"463. Taken this into consideration, an argument can be formed that the mathematization and quantification of things and services, in this case of architecture and its characteristics, facilitate and promote its quantitative and therefore its exchange value. As architectural properties are abstracted into quantities, it becomes easier to include them and


462 Ibid., 125.

463 Ibid., 126
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adapt them to processes of exchange\(^{464}\). Marx writes: "Let us now take two commodities [...] Whatever, their exchange relation may be, it **can always be represented by an equation [...]** What does this equation signify? It signifies that a common element of identity magnitude exists in two different things [...] Both are therefore equal to a third thing, which in itself is neither the one nor the other. Each of them, so far as it is exchange-value, must, therefore, be reducible to this third thing[...]This common element cannot be a geometrical, physical, chemical or other natural property of commodities[...]the exchange relation of commodities is characterized precisely by its abstraction from their use-values\(^{465}\). This common factor in the exchange of commodities is their economic value, which according to Marx is measured in labour-time\(^{466}\).

However, a thing, an architecture can be useful (a use-value) and an object of labour without being an economic value. As architecture is produced through labour, this can happen when the use-value produced is not being commodified but carries another form of social value\(^{467}\). So, when it is produced and consumed by the same person or group from which is consumed and does not participate in a process of exchange. If we draw a parallel with the public institutional architecture produced by and for the British welfare state, this architecture,

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\(^{464}\) For David Harvey, everything that pertains on use value lies in the provenance of absolute space, while everything that pertains to exchange value lies in relative space time. The circulation and accumulation of capital occurs in relative space-time. Harvey, David. "Space as a key word", in Spaces of Global Capitalism, Towards a Theory of Uneven Geographical Development, 141.

\(^{465}\) Marx, Karl, Capital, Volume I, 127.

\(^{466}\) Deleuze and Guattari affirm and expand this: "Even before the capitalist production-machine is assembled, commodities and money effect a decoding of flows through abstraction. But this does not occur in the same way for both instances. First, simple exchange inscribes commercial products as particular quanta of a unit of abstract labour. It is abstract labour, posited in the exchange relation, that forms the disjunctive synthesis of the apparent movement of commodities, since the abstract labour is divided into qualified pieces of labour to which a given determinate quantum corresponds. But it is only when a "general equivalent" appears as money that one enters into the reign of the quantitas, which can have all sorts of particular values or be worth all sorts of quanta. This abstract quantity nonetheless must have some particular value, so that it still appears only as a relation of magnitude between quanta. It is in this sense that the exchange relation formally unites partial objects that are produced and even inscribed independently of it. The commercial and monetary inscription remains overcoded and even repressed by the previous characteristics and modes of inscription of a socius considered in its specific mode of production, which knows nothing of and does not recognize abstract labour."

\(^{467}\) David Harvey underlines that value is relational concept, which is immaterial but objective. Value is a social relation that is measured by its effects and it is referent is relational space. Harvey, David. "Space as a key word", in Spaces of Global Capitalism, Towards a Theory of Uneven Geographical Development, 141.
being produced by the state and serving the needs of its citizens, escaped its exchange-value and became merely a use-value; through its qualities, it satisfied the human needs of the citizens for housing, education, and healthcare. It was towards this end that the initial controls on land and construction enterprises were established by the British state. This way, the architecture of the welfare state carried an unquestionable social value rather than an economic one. By starting to quantify and calculate the properties especially of public architecture, as it was the case with the government centre of Whitehall for example, as well as with the universities and housing estates that were studied at L.U.B.F.S. centre, the exchange value and eventually, its economic value is prioritized. This way, it becomes much easier, as it happened with many of the public state owned buildings in Britain from the late 1970s onwards, to include them as commodity assets into processes of economic exchange and monetization that would eventually lead to their sale to the private sector. One could say that this was possible, exactly because their architecture was presented as a quantified commodity that was manageable through calculations. Thus, substantial architectural social use-values that were part of welfare provisions and served the de-commodification of certain domains of life, became eventually possible to be subtracted from the British citizens. Instead, they started to participate in the exchange processes of the private domain. Of course, all these would not have been possible if the relevant neoliberal government policies and laws were not put in place, initiating and legalizing these transfers from the public to the private domain. Nonetheless, it is essential to demonstrate how the application of certain calculative practices, operating as invisible technologies of government both in public administration and in architecture, contributed to these changes.

The outcomes of these calculative processes can be planned, but also assessed and evaluated based on specific standards or demands. This way, the architectural design is described by how well it performs specific functions or achieves certain standards. Hence, the design process easily becomes a process of optimization in which the maximization or minimization of certain outputs most often defined by the market, is pursued and determines the parameters (architectural or not) that are selected for the design. The selection of the best values of these components in order to achieve the desired outcome becomes part of this process. So, architectural design is driven by this logic of optimization rather than any other, aesthetic, political, or social attributes. Of course,
processes of optimization raise questions of efficiency, of achieving an objective in a way that makes the best use of the resources. Efficiency is evaluated based on whether the outcome of a process (of architecture, a method or research for example) is useful, profitable, or beneficial; so, whether it provides an advantage, or a benefit to a person, a group, or a society. Efficiency is to achieve the best possible use in order for an objective to be fulfilled. In that sense, efficiency aims for the optimum. What are these objectives and who decides on them, though? It is something that requires a thorough examination. Objectives are dependent on definitions of value, so on the denotation of what is important. A profit, benefit or value can carry diverse characteristics. It can be economic or social, individual or common. For example, social profit is a benefit, a good or service provided to society or a social group often serving its well-being. Knowledge profit is a benefit regarding the advancement of knowledge and truth. What an architectural profit could be, is essential to define. Does an architecture that addresses one’s needs, by employing spatial, urban, and architectural qualities provide a profit? What kind of profit is this and to whom? Jeremy Bentham’s empirical philosophy of utilitarianism, for example, evaluated merely the utility of things in relation to their consequences and the overall happiness, pleasure, or pain a thing or action produces. Should the utility of architecture in this sense, be evaluated regarding the happiness it provides to its users or to the general public? Economic profit, on the other hand, is the financial gain that an economic agent acquires from a good or service and is usually measured in currency. This is independent of the fulfillment, happiness, or pleasure it provides, as it is defined by the conditions of exchange. Since the eighteenth century, neoclassical economics started relating the exchange value of a product to its usefulness (utility) rather than its cost of production. This way, it was the market and the processes of exchange that started to be the spaces of veridiction of utility and therefore of the effectiveness of something (either that is an action, a service or a governmental policy), rather than the actual satisfaction of a certain need (which is related to the use-value of something). Thus, the understanding of efficiency started to be directed by the logic of

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469 On which many of the economic principles of neoliberalism have been based.
maximization of economic profit within the market rather than any other form of profit or benefit, social or political.

Evaluating architecture through economic standards merely means evaluating how it can become an element of economic wealth, a valuable commodity that would maximize one’s profit (this being a corporation or the state’s). Ironically, nowadays, this is often achieved by minimizing production costs. So, by reducing the material and technical qualities of architecture or by exploiting and devaluing the required labour. Other times, the economic profit is pursued through the direct projection of wealth into formalistic and ornamental embellishments that would justify the architectural artifact as an object of luxury and therefore as a commodity to be traded at a high price. Sometimes, other forms of evaluation are employed to assess the efficiency of architecture, but these expressions of efficiency are also quantified so that they can be easily translated into economic data. Usually, they are directly related to the framework or the conditions of the operations of the economy. For example, environmental assessment is linked to the use of material and energy resources, which do have an economic value. One could say that architecture gradually, became contained into a system that is self-referential, that of the capitalist market economy and its principles and it is governed by its market performativity. As Alberto Perez-Gomez argues in Architecture and the Crisis of Modern Science, the algebraization or instrumentalization of architectural theory through the use of science and mathematics that started in the eighteenth century in parallel to the development of the capitalist market, “…implies its transformation into a set of operational rules, into a tool of an exclusively technological character.” And “Its main concern becomes how to build in an efficient and economical manner while avoiding questions related to why one builds and whether such activity is justified in the existential context.”

I would argue, as this thesis has demonstrated that the expansion of calculative practices and rationalities within the welfare state, presented through the

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470 In this context for example one needs to consider the contemporary development of robotic construction and 3D printing methods, but most importantly the working conditions and renumeration of the architectural workers.

pretext of scientification, adapted the priorities of the state to those of the market establishing the processes of quantification, efficiency, and optimization. This way, many of the processes in the administration of the welfare state, as well as in the production and research of its architecture, became economic rational actions. Through methods of standardization, processes of optimization, and the abstractions of quantification, public architecture also became tradable between different economic networks. Therefore, it could be argued that architectural design was transformed into what Max Weber calls an economic rational action, directed by managing resources and deliberately planning itself towards economic ends. According to Weber, economic rational action is an “action which is rationally oriented by deliberate planning to economic ends”\(^{472}\). It is a conscious orientation of actions and of actor’s control over resources to economic considerations and ends. Distinguishing between political and economic means, Weber underlines that rational political action can be economically oriented in order to provide for the necessary or serve certain interests (such were the actions that formed the British welfare state). In contrast, an economic action is not inherently political. Actually, many economists considered that it can only serve economic interests and profits. Nonetheless, it can implicate political means.

Most importantly, Weber attempts to distinguish between actions of economy and technology. He considers both as rational actions, but “technology is applied to an action and refers to the totality of means employed as opposed to the end to which the action is oriented. Rational technique is a choice of means which is consciously and systematically oriented to rationality and scientific knowledge. Technical efficiency may be the least action for the achievement of the optimum result with the least expenditure of resources[...]. Technology is concerned with the means to achieve the end[...] Given this end is a matter of choice of the most ‘economical’ means is taken into account[...].”\(^{473}\). Thus, Weber underlines that as soon as technical decisions and actions need to consider economic elements, are no longer purely technical, but also economic. As soon as technical questions start involving issues of alternative use of means, of disposition of resources, of


\(^{473}\) Ibid.160-163.
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cost and scarcity they involve economic aspects that affect the decisions of ends. The technical decisions affect and are affected by economic decisions since issues of equipment, resources, and labour are part of the exchange economy. This way, Weber connects technology to economy. In fact, he notes that "[...] what is called the technological development of modern times has been so largely oriented economically to profit making, that is one of the fundamental facts of the history of technology. There has been an economic determination of technological development."\(^474\) In this perspective, technical issues, decisions, and practices need to be considered in relation to their implications in regard to the exchange economy, the contractual relations they form, the control over the means of production, and of the services of labour that they facilitate.

Architecture, despite its claims for autonomy always existed between technical, aesthetic, social, and economic considerations. This has been ever more evident since the late 1960s\(^475\) that the influence of economic considerations has been defining architecture merely as a commodity. This has influenced architectural design in many aspects, from the tools it employs and the means of representation it uses to the actual economics in the construction of a project and the assessment of its performance. Jeremey Till in his editorial text on The Economies of Architecture underlines the urgency of bringing back other values (social, cultural, environmental) in architecture as there has been for a long time dismissal of any other form of value beyond the economic\(^476\). This domination of economic values in the design and production of architecture "reduces all the complexities of spatial production down to a spread-sheet over, which only quantity surveyors and outsourced subcontractors have control... Where once the architect oversaw the entire process, now they are left swinging in the wind of economic forces controlled by others"\(^477\).

As we examined in the previous part, these forces were evident in architectural research and education too. The formation of state-academic-industrial complexes in many universities in Britain during the 1960s would employ

\(^474\) Ibid. 163.

\(^475\) I am using this date as during the postwar period between 1945 till the late 1960s there were still many public building programs taking place that would foreground merely social priorities.


\(^477\) Ibid.
technological innovations and scientific methods produced and tested in the universities for the development of applications and products that were to be commercialized and used in the market. This way, the state through the funding of academic research attempted to stimulate the economic development of the construction industry and the formation of enterprises. It promoted architectural research that is applicable and has clear economic effects. In parallel, as architecture presented itself in a positivistic way, both the state and the privately funded research would focus on the production of tangible, quantified results that have direct applicability in the industry. Thus, architectural research and education started to be directed by the pursuit of economic development and the boost of entrepreneurship rather than experimentation and freedom of thinking. Deleuze and Guattari in their Treatise on Nomadology distinguish between state or royal science and minor science, the first one is a scientific method of “reproducing”, the other of “following”. “Following is not the same as reproducing. Reproducing implies the permanence of a fixed point of view that is external to what is reproduced: watching the flow from a bank...” the second is in search of the singularities of a material and not out to discover a form.” ⁴⁷⁸ Minor science is appropriated by the state, they claim. In this sense, the architectural research within the state-academic-industrial complex can be considered as a form of state science in which the fixed view of the economy would direct the research looking for concrete applicable forms of practice and knowledge. Architectural research would seek legitimization through its economic impact and market applicability. So, it would be bound to its economic performativity.

This way, one could argue that architectural research started taking the form of an enterprise, aiming to achieve economic profit through the transfer of knowledge and expertise from universities to the market. The state and the private corporations played the roles of the entrepreneurs that use and direct the means of production for the creation of economic profit and partake in the formation of the future conditions of the market. This way, during this transitional period, the state took the risk of these enterprises and facilitated the expansion of the market within the public domain of the universities. It is characteristic for example, that many of these research initiatives led to partnerships formed

between universities and businesses with the aim of commercially exploiting the findings and products of academic research for the economic development of the corporations. The introduction of innovations or the improvement of services and products would provide them with a competitive advantage to other enterprises. Thus, these initiatives initially funded by the state opened up the public universities to the demands of the market and contributed to the multiplication of enterprises, the nurture of entrepreneurship, and the increase of competition, aligning the construction industry with the main principles of the neoliberal market. This can be seen as an in-between step in the transition from liberalism to neoliberalism during the 1960s and 1970s. It needs also to be considered as the beginning of the development of the knowledge problem⁴⁷⁹, presented by Friedrich Hayek as the basis of the neoliberal economic approach. Hayek considered that planning from the state was impossible as no one can actually have access to total knowledge that was necessary for it. For him, the fragmentation and distribution of knowledge could help the development of many different individual enterprises that had access to different forms of knowledge. Through the multiplication of enterprises, economic competition would advance. Pierre Dardot and Christian Laval in The New Way of the World, explain that “The problem of knowledge is not peripheral to economic theory, but central...The economic object par excellence is the problem of coordinating specialist tasks and allocating resources [...] The market economy is an economy of information that makes it possible to mobilize this information and communicate it to others through prices [...] Hence, the importance of the decentralization of decision-making, so that everyone can act on the information they possess⁴⁸⁰. This decentralization of decision making also realized a distribution and a transfer of responsibility from the state to the individual. This is an issue that we will examine in more detail in the next part of the thesis in order to investigate its implications in distributing knowledge and regulating the conditions of employment through the control of educational institutions. Nonetheless, it is important to outline here how the formation of these state-


academic-industrial complexes paved the path for the changes that took place in the architectural profession and education in the following years.

In this context, architects and researchers started to take not the role of technicians, but of technocratic managers that through the use of technology and scientific knowledge develop products and working methods according to the requirements and demands of the market. They organize, streamline, and administer the architectural production while planning and employing systems, methods, and procedures of design that promote the efficiency and optimum performance of their designs and buildings. Using technical expertise and knowledge, they aim to apply science and technology to solve problems and control the outcome of their work in order to satisfy social and economic demands. This attitude towards architectural design was promoted by both architectural education and the universities’ state or privately funded research programs to make architectural design and its methods explicit, easily measured, and assessed. This technocratic approach would request the development of professional accountability by architects and researchers and therefore, of calculative rationality towards design that is characteristic of technocrats. It would take different forms in practice, but its aim would be to legitimize and justify architectural decisions through calculations and the use of scientific methods. “Accountability is a surrogate for trust and is a necessary condition for exchange between disparate interests.” 481 explains Arindam Dutta. One could indicate that this demand for accountability in architectural processes, became necessary exactly because architecture started to be evaluated based on explicit economic criteria and through processes of exchange. Indeed, this demand for accountability becomes essential in many professions from the 1960s onwards. One of them, as we saw at the beginning of this part (3.4), was that of the civil servants and government officers482. Hence, one can draw a parallel of similar calculative technologies of power governing diverse fields of work and production within the welfares state.


In Britain, industrial and office spaces were transformed by the work of private architectural practices that implemented new ways of management and of organization of labour since the 1960s. Young British architects building upon the work of Buckminster Fuller and the cybernetic visions of Cedric Price and Archigram started to apply high technologies and to implement a calculating logic in the design of industrial and office spaces. Speaking the language of science, they introduced systems of design that would facilitate the invisible networks of communications and services that had become essential in the working environments. As Murray Fraser explains: “the goal was to revolutionize and modernize the labour conditions inside and to transform British working practices in holy conjunction with the manufacturing spaces they housed them.”

The first of such examples is the Reliance Controls electronic factory (1966), which specialized in the production of precision electronic equipment, and was designed by Team 4. It was a well calculated, but generic and flexible space without hierarchies that could adapt to the needs of production, eliminating any distinctions in hierarchy. The design of IBM offices by Foster Associates in the 1970s and of Patscentre building by Rogers and Partners were other such examples. Initially, through the work of Team 4 and later through their independent practices Norman Foster and Richard Rogers were instrumental in introducing in Britain the application of computers in the work environment and in altering the modes of work through the design of space.

According to Andrea Mennicken and Peter Miller, these calculative instruments have the ability to transform personhood, developing a form of self-government to people. Most relevantly, though, they have the ability to construct calculable spaces that individuals inhabit. These calculable spaces often take the form of striated spaces, which are grided, linear, and metric, but most recently have also taken the form of smooth spaces that are topological and vectorial. Striated

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484 Team 4 was formed by Richard and Su Rogers, Norman Foster and Wendy Cheeseman in 1963.


486 I am here referring to striated and smooth space as defined by Luciana Parisi in Contagious Architecture. Parisi explains that, “a prefixed, grid-like architecture derived from postulates based on discrete sets of algorithms through which optimal forms can be constructed. This is the striated space of the city, the urban planning deduced from the exact relation between points, which
spaces can be traced back to the disciplinary institutional spaces of panopticon prisons, the school, the factory, and the modern hospital that were formalized in the eighteenth century and that Michel Foucault describes in his writings. They also took the form of modern office spaces such as the Taylorist open plan office spaces or the office landscapes (burolandschaft) that Reinhold Martin analyzes in the Organizational Complex and Louis Mozingo in Pastoral Capitalism, A History of Suburban Corporate Landscapes. Smooth spaces have proliferated in the last few decades through the expansion of computational design in architecture and as Douglas Spencer demonstrates in The Architecture of Neoliberalism are characteristic of the current neoliberal ways of governance. Spencer analyzes different recent formations of such spaces like factories, offices, cultural centres, and universities and explains how they affect the processes of labour, learning, citizenship, consumption, and ultimately influence the constitution of subjectivity within them.

As we saw at the end of the first part of chapter three (3.3) when examining Whitehall, calculations have the ability to form spatiotemporal structures and to define their performance. They prescribe space, regulate and affect the actions and behaviours of the people who occupy and use the space. Thus, calculations have the capacity to territorialize and deterritorialize, to constitute and organize space and people. Following Deleuze and Guattari, we could indicate establishes an infrastructural grid that predetermines movement. In the last twenty years, however the digital mapping of space has been intersected by a new tendency in digital design that has more fully embraced the power of computation to generate new architectural forms or smooth surfaces...the topological curves of smooth space (or blob architecture) starts from the generative power of a point, the meshing and folding of which becomes the condition for the emergence of a new form. Between the two she proposes meretopology as the space of the relation between discrete parts that are semi-open, that are finite segments and actualities in relation to each other. See: Parisi, Luciana, Contagious Architecture, Computation, Aesthetics, and Space, x-xii.

This definition of striated and smooth spaces differentiates from that of Deleuze and Guattari. For them, striated spaces are controlled and instituted by the State apparatus in opposition to smooth spaces that are nomad and in which war machine develops. However, smooth, vectoral space can also be captured by calculations and transformed into striated. See: Deleuze, Gilles and Guattari, Felix. "1440: The Smooth and the Striated", A Thousand Plateaus, (London: Bloomsbury, 2013), 551-581.

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Also: "Deterritorialization" and "Abstract machines", A Thousand Plateaus, 591-597.
that they can (functioning as abstract machines) form territorial assemblages, they can organize "a collection of things which have been gathered together or assembled"\textsuperscript{490} and create territories. In parallel, calculations work at the edges of these territories and are able to expand and connect them through specific rules to other entities. This way, they manage to code space and behaviours while opening them up to external forces. Mennicken and Miller indicate two principal ways in which calculations territorialize. "First, it does so by making physical spaces calculable. This could mean a factory floor, a hospital ward, an office, a shop, or even a sub-area of a shop, and much else besides. Second, it does so by making abstract spaces calculable. Examples here could be a "division" of a firm, a "profit centre" or a "cost centre" of an organization." Also "time is at the heart of so much of the calculative repertoire"\textsuperscript{491}, they note.

Hence, calculations prescribe certain types of performance within space, of movement, timing, and physicality and make architecture operative. Architecture determined by calculations, in its physical or abstract form influences the behaviour of its users and operates as an apparatus of governance, prescribing specific behaviours, and participating in the formation of the subjects. Architecture activates actions, reactions, behaviours, and attitudes. It constructs the calculable spaces that individuals inhabit, in which they live, work, and breath, and this way, they affect the formation of their subjectivities. As "our writing tools are also working on our thoughts"\textsuperscript{492}, our spaces are also working on our thoughts. Through the organization of space and the effects produced in it, calculations direct and shape human labour and life. Through the quantification and rationalization of work and living spaces, but most importantly of the public spaces and institutions, merely for reasons of efficiency and economy that were explained previously, space carries a calculative logic that leads to forming a calculating subconscious and to constitute calculative and quantified selves\textsuperscript{493}.

\textsuperscript{490} Ibid., “Assemblage”, 585-587.

\textsuperscript{491} Mennicken, Andrea and Miller, Peter, “Accounting, Territorialization and Power” in Foucault Studies, No. 13, (May 2012), 20.


Aiming to attain economic efficiency in all the aspects of our lives, we manage ourselves and our spaces towards this end, turning into the calculated human enterprises that neoliberalism requires. Peter Miller, in a number of his writings, investigates this calculated management of life and how it produces an "alignment between the accumulation and distribution of persons and their capacities on the one hand and the accumulation and distribution of capital on the other." More recent literature and research on the quantified self and the computational unconscious continues these investigations taking into consideration the effects of the application computer technology to users and spaces as part of the development of algorithmic governmentality that conducts them into becoming-management themselves for the production of pure data.

Reviewing the above analysis of the calculative practices of the architecture of science as these developed from the 1960s, we can summarize their effects as follows: Firstly, the promotion of exchange value and the commodification of architecture through the extensive practices of quantification. Secondly, the transformation of architectural design into an economic rational action through the processes of optimization. Thirdly, the operation of the architectural profession and research as an enterprise that seeks economic profit. Fourthly, the transformation of architects from designers to technocratic managers, as they became experts that use processes of accountability and scientific legitimation. Fifthly, the production of calculated spaces and territories. Finally, they


Rouvroy puts forward algorithmic governmentality as a form of purification of neoliberalism, which differs from that of Foucault regarding the management of human capital. She considers it as continuation of the definition of capitalism by Deleuze and Guattari as a process of decoding that operates without subjects, without world or life.

contribute to the formation of a calculative self or unconscious at the users and the producers of these spaces. It becomes evident, that these are all practices and rationalities of architecture that facilitate and multiply the neoliberal principles of enterprise, performativity, and competition that are oriented towards economic profit rather than social profit. This way, we can contend that it was through these practices and rationalities that the mentality and principles of neoliberal technocracy started to become part and eventually prevail in the architectural profession and production.

The architecture of science that was nurtured within and due to the calculative practices of the welfare state, was eventually transformed through the prevalence and modification of these calculative practices into an architecture of neoliberal technocratic management. I would like to suggest that this kind of architecture in the form of technocratic managerial practice emerged in the architectural discipline during the late 1960s and 1970s through the tendencies of scientification of the architectural design and the emergence of an architecture of science. This form of architectural practice and research was nourished within and by the calculative practices that were in place at the mature British welfare state. We examined these calculative practices and rationalities unfolding and changing both within the structure of the state and the operations of the civil service as well as in the architectural practice, research, and education. These kinds of practices prepared the ground for the advent of neoliberalism during the late 1970s and 1980s. Most importantly, and this is what the thesis tried to demonstrate is that these practices as they do not carry a distinctly political character, they function invisibly and are incorporated in the administration of lives, spaces, and institutions, establishing new rationalities regarding the priorities and role of the state, the market and the individual. This way, they can act as technologies of government, which make possible the implementation of market-oriented policies and the deployment of a form of government that has neoliberal characteristics. This is not an argument to dismiss the welfare state and its significance in bridging inequalities through planning. On the contrary, it is an attempt to map and understand its transformation and the transition that took place a bit later, building upon and expanding on existing practices of liberal capitalism within the welfare state. It is also telling of how neoliberal governmentality operates from within, administering, and managing people and practices. By developing technologies of
government, such as the calculative ones, neoliberal governmentality started to transform the practices of work, of production, of institutions, and most importantly to change people’s mentalities, long before the actual neoliberal policies and measures were put in place. We can look briefly on the effects these changes had in the wider architectural discipline.

Manfredo Tafuri in the last two parts of Architecture and Utopia already discusses these issues and the results of the applications of mathematics and computing in architecture in relation to the development of capitalism. He observes: “Connected as they are to capital’s extension of the use of science and automation, these languages are systems of communication that come into being from a plan of development: function is to articulate with the maximum efficiency, a project of global planning of the productive universe. In this respect, the creation of such ‘artificial languages’ is connected to the development of techniques of scientific prevision of the future and to the use of the ‘theory of games’ in the realm of economic programming. That is to say, we are witnessing the first-still Utopian-attempt at capital’s complete domination over the universe of development”. Tafuri in this text foresees the time that capitalism will function through computer and calculating signs. At the same time, he denounces the operations of the avant-garde as operating through empty signs that are barred from any social or political purpose. “The only utopia that the art of the avant-garde was able to proffer was the technological utopia.”, he writes in Architecture and its Double. Thus, the two realities of architecture by the 1970s for Tafuri were either the manipulation of empty signs completely detached from any social or political meaning or the full compliance to the capitalist production through the pursuit of technological and scientific applications. Within this context, he rightly questions the historical and political role of architecture: “Viewed in this light, what remains of the role played historically by architecture? Up to what point does architecture’s immersion in these processes render it a

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Antoinette Rouvroy in more recent writings also stresses this complete domination of capitalism that has been made possible through the abstract and emptied language of computer signs.

500 Ibid. 153.
pure economic factor? And to what extent are decisions taken in its own specific sphere reflected in larger systems?"\textsuperscript{501}, he writes.

Even if architecture was not yet completely transformed into a pure economic action in the welfare state of the 1960s, by becoming focused on technical and specialized practices of mathematical problem solving, was presented as a neutral discipline directed by objective facts and the pragmatics of reality. It was taken over by the technocratic ambitions of economic and organizational efficiency, directed towards producing quantifiable results and assisting the realization of the managerial decisions of the technocratic British state\textsuperscript{502} and of other technocratic institutions and corporations. Within this context, as we saw, architects started to operate as technocratic managers and experts, characterized by the neutrality of scientific methods rather than the pursuit of social or political plans. This way, architecture was barred from any political or social purpose and became once again depoliticized. Its role was not to change the built environment in order to achieve better living conditions and the welfare of citizens as it was the initial purpose of the welfare state architecture, but rather to manage and administer them within the existing operations of the capitalist economy.

In this depoliticization of many of the domains of life, Slavoj Zizek sees the beginning of post-politics. In \textit{The Ticklish Subject}, he notes: "In post-politics, the conflict of global ideological visions embodied in different parties which compete for power is replaced by the collaboration of enlightened technocrats (economic, public opinion specialists...) and liberal multiculturalists: via the process of negotiation of interest, a compromise is reached in the guise of more or less universal consensus. Post-politics thus emphasizes the need to leave old ideological divisions behind and confront new issues armed with the necessary expert knowledge and free deliberation that takes people’s concrete needs and demands into account....The ultimate sign of post-politics in all Western countries is the growth of a managerial approach to government: government is reconceived as a managerial function, deprived of its properly political

\textsuperscript{501} Ibid. ‘Problems in the Form of a Conclusion’, 176.

\textsuperscript{502} This is further developed in 3.1.
The politics of calculations

dimension\textsuperscript{503}. This is something that we examined emerging clearly in both British architecture and government during the 1960s. Japhy Wilson and Erik Swyngedouw affirm this orientation of government towards issues of consensual policy as characteristic of post-politics. They describe it as follows: “In post-politics, political contradictions are reduced to policy problems to be managed by experts and legitimated through participatory processes in which the scope of possible outcomes is narrowly defined in advance. ‘The people’ – as a potentially disruptive political collective – is replaced by the population – the aggregated object of opinion polls, surveillance, and bio-political optimisation. Citizens become consumers, and elections are framed as just another ‘choice’, in which individuals privately select their preferred managers of the conditions of economic necessity”\textsuperscript{504}. In contrast, Zizek underlines: “authentic politics is not simply something that works well within the framework of existing relations, but something that changes the very framework that determines how things work”\textsuperscript{505}.

Nadir Lahiji elaborates this understanding of post-politics in architecture based on Zizek’s ideas in parallel to those of Jacques Rancière in his text The critical project and the post-political suspension of politics. He considers the separation of the discourse of architecture from the critique of contemporary capitalism and the disappearance of the critique, against the technocratic abuses of architecture, as central problems in the depoliticization of architecture. He observes that this negation of politics comes in the form of the consensus politics that have transformed politics into management\textsuperscript{506}. Douglas Spencer agrees with this understanding of post-politics, which he investigates in detail in his book The Architecture of Neoliberalism and in a number of other texts. He explains the operations of the architecture of neoliberal managerialism through the

\textsuperscript{503} Zizek, Slavoj, The Ticklish Subject: The Absent Centre of Political Ontology, (London: Verso, 2009), 198.


\textsuperscript{505} Zizek, Slavoj, The Ticklish Subject: The Absent Centre of Political Ontology, 199.

examination of a series of architectural examples from the 1970s till recently that he relates to the emergence of a post-political period in architecture\textsuperscript{507}. More specifically, Spencer in this book elaborates on what he names as architectural Deleuzism as an essential characteristic shift of architectural theory and design. He relates, the formalistic mistranslations of the Deleuzian vocabulary in architecture and its theory to the affective turn of architecture which, he accurately links to the operations of neoliberal governance. The book describes the architecture of neoliberalism in the last decades of the twentieth century and the beginning of the twenty-first when these practices were well established. Indeed, by the late 1970s, as this research shows the scientification and technocratization of architecture had already significantly contributed to the managerialization and depoliticization of architecture by presenting issues that were political as technical and administrative.

The depoliticization of architecture is a phenomenon that was in place by the 1960s and was further facilitated by the architecture of science that emerged and developed in a series of places during that time. Ockman positions this phenomenon in the USA much earlier, during the 1950s and even pinpoints its beginning at the exhibition of International Style of 1932 that put forward a stylistic modernism stripped from any social or political purpose. She observes that: “In this context, the affinity of both the profession and the academy for technoscientific thinking, may also be seen at least in part, as an alibi against riskier political entanglements. Architects, like the universities in which they taught, increasingly hewed to the political centre. What Daniel Bell would celebrate in 1960 as the "end of ideology" was really the ascendency of an ideology of liberal consensus, as Godfrey Hodgson has suggested. The process of depoliticizing modern architecture that Philip Johnson and Henry-Russell Hitchcock had commenced in 1932 with their International Style exhibition now


Spencer in this last text draws on the concept of managerial governmentality as put forward by Thibault Le Texier in his text “The Uses and Misuses of Foucault for Thinking Management A Case for a Theory of Managerial Governmentality”. Accessed on the 21st of July 2019: \url{http://www.letexier.org/article.php3?id_article=115}. Although, the concept of managerial governmentality in Le Texier does stress more the managerial and administrative aspects of governmentality, which is useful, it also seems to rely on an initial reading of governmentality as the government of the self rather than to the government of others, which was not so much the case in its definition by Foucault in Security, Territory, Population.
became institutionalized in the schools which embraced modernism on specifically 'American' terms. What the U.S. government demanded from its intellectual elites during the early Cold War was 'a maximum of technical ingenuity with a minimum of dissent'\textsuperscript{508}.

Arindam Dutta seems to agree with this position and he names this form of modernism as second modernism\textsuperscript{509}. He relates it to a research-oriented and technologically based formation of the architectural discipline focused on scientific design expertise similar to the ones we examined at Cambridge University, but in this case, he and his co-writers, rely on the work and research developed at the M.I.T. during the 1950s and 1960s. According to him, this was a techno-social moment of architecture, which configured architectural design and research as a form of administration that employed technological constructs and social protocols towards performance. Dutta drawing on Francois Lyotard’s definition of postmodernism as the shift from epistemological truth to performativity considers this second modernism or techno-social moment of architecture as part of the post-modern transformation, which shifted the interest from the grand narratives to the pragmatics of architecture and knowledge\textsuperscript{510}. In this sense, he asserts some of the points that were raised in this research. Most importantly, he underlines that 'this turn of events was in fact a culmination of the processes which they (the architects and researchers of second modernism) had themselves been party to'\textsuperscript{511}. So, he confirms, the thesis’s understanding of these practices as transformative ones. This change was especially evident at the universities and altered significantly their operation. Another important change that this postmodern / post-political turn brought was the gradual disappearance of planners and the emergence of a “cadre of professionals who would step to the beat of the economists and bankers and real


\textsuperscript{510} See: Lyotard, Jean-Francois, The Postmodern Condition, (Manchester: Manchester University, 1984), Chapters 11 & 12, 41 – 53.

estate developers in parallel to a gradual pursue of economic efficacy and the exploration of creativity as another form of capital. "If practical reason would retire truth, creativity would kill art", notes Dutta. Antoine Picon stresses this change even further and believes that a performative turn has taken place and architecture has started to be considered as a form of action, as a performance. He regards that we are currently experiencing a further destabilization of the notion of representation in architecture, which on one hand, has to do with the questioning of the architectural form, but most importantly, with the fact that form is not anymore the final product and the predominant aspect of the design process, but an occurrence within the dynamic world of information and computers, which produces affects and is based on calculations. Thus, one could observe that both the post-political and post-modern turn in architecture, are rooted in the foregrounding of this performativity which has taken diverse forms. One of them being the architecture of technocracy as we described it in the previous part, that was developed through the calculative practices of the architecture of science in the 1960s and 1970s. Another being the empty formalistic excessiveness of architectural postmodernism, which took a digital turn in the last decades. This relation between the depoliticization of architectural practice and discourse and the rise of postmodernism is an issue that we will discuss in more detail in the last part of the thesis. At this point, we need to briefly summarize the effects of the calculative practices of technocratic architecture and the depoliticization that it cultivated, in the realm of architectural practice.

As we examined, through the proliferation of scientific in form but economic in praxis calculations, the architectural practices that in the past were employed towards the social and political purposes of welfare and equality, were transformed and depoliticized. They were oriented towards the pragmatics of the economy rather than the agonistics of politics and social change. The calculations of welfarism allowed for issues of optimization, time, cost, labour, control and economic efficiency to become the main focus of the architectural

512 Ibid.
513 Ibid.
design processes. This way, the expansion of neoliberal practices of economic profit was possible, undermining the political and social base of the public welfare architecture that was in place and preparing the ground for the monetarization and eventual privatization of these architectures. The technocratic architecture that emerged within the operations of the late British welfare state facilitated and put forward a way of working and living according to economic profit and entrepreneurship that worked towards the dissolution of the previous social and economic planning efforts by the welfare state. The thesis does not dispute the importance of calculations as an analytical or scientific tool, what it aims to underline is the way this tool has been employed by neoliberalism as a technology of government in order to neutralize its policies, but most importantly to facilitate the interchange between different domains of immaterial and material production, political economy and the economy of the subject in order to eventually foreground perceptions of value that carried an economic rather than a social significance. Thus, the operations and the territory of the neoliberal entrepreneurship could expand to every molar and molecular level of the British citizens. Human subjects, tools, architectures, and environments were directed towards a gradual managerialization and depoliticization in order to open towards their eventual entrepreneurial and financial modification. The calculative practices and rationalities in architecture, science, economy, and government that the thesis examined, allowed for a common language to develop between these different fields and contributed to the transformation of the welfare state. As we saw at the end of part three (3.3) calculations operate as abstract machines that are able to connect these diverse fields. The calculative practices of architecture function both on the level of political economy and the economy of the subject. This way, the proliferation of calculative processes facilitated a form of governing at a distance that had no political appearance and the calculative operations of architecture formed an apparatus of governance within the architectural practice.

In this part, the thesis investigated how architecture and the state through the proliferation of calculative practices started to carry the mentality of enterprise and of economic action and to become depoliticized. In the next part, we will examine how these transformations of the welfare state, were reflected and realized through important changes in the social policies of the state and the
production of public architecture for welfare. This way, new socio-economic conditions and forms governance were eventually established.
TRANSITION
The thesis concludes by examining the crisis of the welfare state from the late 1970s onwards and the changes that have taken place, altering the welfare policies of the state and the role that architecture played in them. Initially, it outlines the political and economic changes that started in the late 1960s and 70s and developed further during the 80s and 90s. It focuses on the effects that these changes had on the production and nature of the institutional architecture in Britain. Most importantly, it analyzes the ways that the state started addressing people not as social citizens, but as responsible consumers and entrepreneurs. The thesis reflects on the role that some of the previously analyzed operations and rationalities, played in this transition and argues that their proliferation within the welfare state, contributed and realized some of these changes. These changes in policies, became possible exactly because previous alternations in the rationalities and practices of both architecture and government had already transformed the ways people and the state functioned, aligning them to the forthcoming neoliberal policies. The operations examined in the thesis established a form of neoliberal governance, that is self-regulating and is applied not from above but from within. Subsequently, the thesis extracts conclusions on the function of architecture as an apparatus of governance within this neoliberal context by drawing information from the previous analysis, it reflects on the examined operations as constituent to the formation of the new modulations. Finally, the thesis questions the political possibilities and potentials of architectural apparatuses.
4.1 British architecture from the welfare state to the state of workfare.

In this final part, the thesis presents the effects of the above changes in the rationalities and practices of the welfare state. These effects are reflected in the transformation of the policies of the state and the production of public architecture. Through the establishment of the policies that are presented below and which built upon the existing technocratic and managerial practices, the transformation of the welfare state into a state of workfare is fully realized, making possible new forms of governance to be established. By the end of the 1960s, the provisions of the British welfare state had achieved to limit the economic and social inequalities significantly and to provide access to consumer goods and opportunities to a large number of citizens. The decommodification of certain domains of life (medical care, education, etc.) improved the absolute living standards of people. By the 1970s, there was a significant demographic change in the British population. The workforce was increased by the baby boomers, as it was the affluence of the population. Most importantly, there were essential changes taking place in the nature of work and the operations of the economy. The new technologies of communication, computerization, and information together with the development of faster transportation and technological systems allowed for more flexibility in manufacturing and supply that could adapt to demand. This way, production was adjusted to risk taking and fluctuating demands, while industry increased its reliance on communications, information management, and services, transforming significantly the labour market. In parallel, the increased circulation of people and goods across national boundaries established a transnational globalized and unrestricted market economy that intensified capital accumulation and limited the control of states over regulations and policies. While the British financial system was previously regulated by rules that protected it from the extremes of competition, it became now vulnerable to international competition. Organizations whose field of action was effectively bounded by the frontiers of their territory like trade unions, parliaments, and national public broadcasting systems, therefore, lost as organizations not so bounded like transnational firms, the international currency
British architecture from the welfare state to the state of workfare market and globalized media and communications of the satellite era, gained. These changes were reflected both on the collapse of the Bretton Woods system in 1971 which was put in place at the end of the second world war to regulate monetary relations between states and on the oil crisis of 1973, where the embargo imposed by the O.A.P.E.C. countries pushed the inflation in Britain to twenty seven per cent that year.

For many analysts, these changes signified an important restructuring of capitalism and for others an evolution of it. Indeed, the 1970s were dominated by an economic slump that was difficult to control. Economic slumps have proved to be structural rather than cyclical in late capitalism. They happened in the 1980s, in the 1990s and most recently in 2008 taking the form of an international financial crisis. During the 1970s in Britain, there was a reduced industrial production and a significant increase in unemployment and inflation, which led to a rise in the costs of welfare provisions. Instability and squalor reappeared after thirty years of economic stability. As the state was unable to extend its welfare income policies, the public sector unions expressed their discontent with extensive strikes during the winter of 1978-1979. In parallel, there was an increased criticism of taxations and the rigid policies of planning by the state that was considered to constrain the freedom of the individuals. The welfare state was accused of being corporatist and bureaucratic from the


526 The collapse of the Bretton Woods permitted the value of the U.S. dollar and of many other currencies to fluctuate, as it was no longer backed by gold reserves. This increased the volatility of the international markets.

527 Organization of Arab Petroleum Exporting Countries. The embargo was imposed as a reaction the Yom Kippur war.

528 Fredric Jameson, following Ernest Mandel theory on the evolution and periodization of capitalism, considers this period as the late capitalism. For David Harvey (in The Condition of Postmodernity), the period after the late 1960s is characterized by the flexible accumulation of capital and internationalism. On this, he agrees with Antonio Negri and Michael Hardt (in Empire) that consider that this period is characterized by the informatization of economy and the rise of immaterial labour. Internationalism is also an important aspect according to Luc Boltanski and Eve Chapello (in The New Spirit of Late Capitalism) that believe that this third spirit of capitalism is dominated by the interests of multinational companies.

529 Joseph Schumpeter expanding Marx’s description of the annihilation of wealth, considered that economic crisis and what he named as ‘creative destruction’ were necessary elements within the development of capitalism, since they drove innovation and sustained the economic cycle. In Capitalism, Socialism and Democracy (1942), Schumpeter argued that these destructions would eventually lead to the end of capitalism.
similar political parties both of the left and the right. This discontent brought the Conservatives back in power with the election of Margaret Thatcher as British Prime Minister in 1979 (Fig. 4.1). Thatcher remained in this position for twelve years and her policies completely altered the economic and social landscape of Britain.

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Fig. 4.1 – Margaret Thatcher became Prime Minister in 1979 and stayed in office till 1990.

Thatcher adopted monetarism\(^{520}\) as an economic policy that could control the amount of money in circulation and reduce inflation. One of the ways to do this was to reduce public expenditures and restructure the welfare provisions. This economic approach signaled the abandonment by the state of the post-war commitment to full employment, as it did not prioritize employment anymore, but would allow for a “natural rate” of unemployment to exist. Later in the 1980s, supply-side economics were also introduced reducing taxation, increasing production incentives, and eliminating any regulative restrictions (such as employment controls by the trade unions or any legal or financial controls) to allow for competition and a free enterprise market to develop\(^{521}\). These

\(^{520}\) Monetarism was introduced through the Medium-Term Financial Strategy of 1985. Monetarism is an economic theory associated to Milton Friedman that relies on the control of money supply.

\(^{521}\) These changes as Luc Boltanski and Eve Chiapello demonstrate in their book The New Spirit of Capitalism, completely altered and dismantled the world of work by allowing for network forms of organization of work to be developed that relied primarily on employee’s self-realization and flexibility.

British architecture from the welfare state to the state of workfare
deregulations affected all of the domains that during the post-war period were
planned and regulated by the state in order to allow for welfare provisions to
materialize. They affected social security, employment, healthcare, education
and housing.

While in the mid-1970s social security acts provided adequate benefits that were
inflation secured and considered within the rights of all citizens, the late 1970s
and 1980s brought a fall in the real expenditures in such provisions. The real value
of benefits was cut, and the number of claimants was controlled and reduced.
The result was a significant rise in poverty during the 1980s. The Fowler Review
and the Social Security Act of 1986 (Fig.4.2) linked tax to benefits522. This meant
people could only claim benefits that were analogous to the taxes they had paid.
This limited the vertical redistribution of income (from rich to poor), allowing for
only a horizontal one within one-person’s lifetime. This approach of deserving
benefits was culminated at the replacement of unemployment benefits and
income support for the unemployed with the Jobseeker’s Allowance (J.S.A.) in
1993, after a fundamental review of public spending523. As Dean Mitchell explains,
in these new schemes “The unemployed person entered into a contract with a
national state that promised access to benefits in return for compliance with the
demand that the unemployed practice their ‘freedom’ in a certain way, that is, as
active job seekers. The national state in effect said: ‘if you make yourself into an
active job seeker, we will support you and provide access to those services and
expertise that will make you job ready’. To put this another way, the state is
constituted by a promise: ‘we will assist you to practice your freedom, as long as
you practice it our way”524. A few years later, all new pension schemes were
privatized and only the old ones remained within the state’s responsibility.
Initially, a series of expenditure cuts and caps were introduced so that in social
security expenditures to stay within budget cash limitations that the monetary
policies required. This had a first direct effect on the operations of local
governments regarding the community care and accommodation they could

522 Retrieved September 12, 2019:
https://publications.parliament.uk/pa/cm199798/cmsocsec/283i/ss0104.htm
524 Mitchell, Dean, Governmentality, 188.
offer. They had to adopt spending assessments and start contracting out services through competitive tendering processes. This way, local governments lost direct control of social policies and became “enablers” negotiating between the central government policies and a market of private providers.

Fig. 4.2 - The Social Security Act of 1986.

In healthcare, the increased cost of expenditures had brought the system at the point of bankruptcy by the 1980s. The healthcare provisions became the responsibility of regional and district health authorities. At these authorities as well as at every hospital, general managers were put in charge to control expenditures and be accountable for the hospital budgets.\footnote{These initiatives were based on the report of the Nuffield Trust in 1985 Reflections on the Management of the National Health Service, by the economist Alain Enthoven. For more on this see: MacKillop, Eleanor, Sheard, Sally, Begley Phillip and Lambert Michael, eds., The N.H.S. Internal Market, (Liverpool: Department of Public Health and Policy University of Liverpool, 2018).} Healthcare budgets
were limited. Procedures of comparative costing and competitive tendering were introduced in the providers of supplies and services. Eventually, in 1989 the Working with Patients\textsuperscript{526} white paper (Fig.4.3) put forward a reform by the government, creating an internal market in healthcare that was based on the “purchaser-provider” division. “The purchasers were initially to be the District Health Authorities. The providers, competing for business and therefore constantly seeking to drive down costs, were either publicly funded hospitals (encouraged to turn themselves into independent trusts) or private ones\textsuperscript{527}. These changes increased the administrative costs and reintroduced commercial principles into healthcare. Most importantly, they created a competitive market in healthcare. Commercial principals started prevailing the provisions in education too. The 1988 Education Reform Act (Fig.4.4) introduced a voucher system into education and transformed education into an internally competitive market\textsuperscript{528}. Parents and students would act as consumers judging and acting according to the quality of educational services provided by the schools. The University Grants Committee was also abolished in the same year. The University Funding Council that replaced it, became responsible for funding and imposed a series of funding constraints toward higher education, while it allocated contracts instead of grants to universities. In parallel, polytechnics that had low operation costs and were market oriented expanded and later gained university status. Education started to be directed toward technical and market-oriented relevant subjects. This way, “the role of universities as independent cultural and academic institutions with unique purposes and justifications [was] thus resolutely eroded\textsuperscript{529}. The gradual reduction in the expenditures of the state

\begin{itemize}
  \item \url{https://www.liverpool.ac.uk/media/livacuk/iphs/researchgroups/governanceofhealth/Internal,Market,WS,transcript,ESM,15.06.2018.pdf}
  \item \url{https://api.parliament.uk/historic-hansard/commons/1989/may/11/working-for-patients}
  \item Lowe, Rodney, The Welfare State in Britain since 1945, 355.
  \item \url{https://www.legislation.gov.uk/ukpga/1988/40/contents}
  \item The act would provide with the parents the choice of their children’s school. The schools needed to compete for pupils in order to acquire indirect funding through vouchers by the parents and to be able to sustain their independent budgets. The Act also reduced the Local Education Authorities (L.E.A.) control on the budget, facilities, and staff of schools, colleges, and polytechnics, while it extended the Local Management of Schools.
  \item King, Desmond and Nash, Victoria, “Continuity of Ideas and the politics of higher education in Britain from Robbins to Dearing”, Twentieth Century British History, Vol 12, No.2, (Oxford: Oxford University Press, 2001), 201.
\end{itemize}
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toward higher education brought the introduction of tuition fees in higher
education at the end of the 1990s based on income criteria. While the later
increase in tuition fees has promoted the formation of a student loan system and
the imposition of debt to young graduate employees. This way, education
became more economically relevant and accountable to its newly formed
consumers rather than an independent provider of knowledge to all citizens.

While, plans to completely privatize the N.H.S. and education failed, in the 1980s,
the deregulation of education and healthcare, formed internal markets, the
operations of which, were gradually outsourced. This way, the state created new
markets and allowed the expansion of private enterprises into previously public
domains. A series of privatizations took place transferring the ownership and
operation of public utilities, infrastructures, and services to private companies.
The "right to buy", the right of the tenants of social housing to buy their homes,
existed since the 1950s but was activated by the Housing Act of 1980 that provided the incentives for this to be realized by offering the houses in a
large discount to their occupants. This provided the opportunity for a large
proportion of the population to own their homes. However, it also reduced the
stock of social housing and increased the social gap between owners and non-
owners. A very large percentage of housing passed from public to private
ownership, altering significantly the housing market, as it contributed to the
commercial speculation on properties, and boosted the financial markets of
mortgage and private debt. The previously publicly owned homes of social
welfare provision were transformed into equities of private wealth. "Buildings,
especially houses, were now investments. In parallel, public expenditure on

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530 These were introduced through the Teaching and Higher Education Act of 1998.

531 British Airways, British Steel, British Oil, British Aerospace, British Coal, British Telecom, Regional
electricity, and water supplies were all privatized. These privatizations were presented as
opportunities given by the state to the people, but in reality, to private companies to buy their share
into the market.


533 This was the largest transfer of wealth from the public to the private domain and the most
profitable privatization that the Conservative governments of the 1980s realized. House of
Commons, Debate January 15, 1980, Vol. 976, cc3443-575 https://api.parliament.uk/historic-
hansard/commons/1980/jan/15/housing-bill

534 Hetherley, Owen, 'How Margaret Thatcher bulldozed over Britain's urban landscape'. The
Guardian, April 9, 2013.
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housing was reduced and the subsidies to local government from the central
government ended. Public housing entered the housing market and the council
 tenants had to pay full rents, competitive to the ones in the market\textsuperscript{535}. The
entitlement to housing transformed from a benefit to a limited and controlled
provision of social security to the ones really in severe need.

Fig. 4.3 & 4.4 – The White paper Working for Patients of 1989 and the Education Reform
of 1988 put forward the formation of internal markets in healthcare and education.

\textsuperscript{535} The local government was to manage the building and allocation of housing than be part of its
construction which was outsourced to either housing associations or to private developers.
Through these acts, the British governments of the 1980s replaced the classic welfare state planning that was at large based on state intervention and the principles of corporatism with policies that promoted individual entrepreneurship and an opening of the state operations to the competition of the markets. A key role in this played the legal control of unions that were forced to operate within stricter regulations. In parallel, as we examined in the previous parts, the civil service that was the carrier of the bureaucratic unity of the state and the coordinator of public services was fragmented, outsourced to executive agencies, and eventually largely privatized. While, professional groups such as teachers, doctors, and academics were excluded from the formation of policies, which relied on managers, private consultants, and technocrats. These new state policies, formed as services, were based on personal responsibility and initiative. Public sector professionals were transformed into technocratic managers that needed to comply with specific performance requirements. While citizens were addressed as consumers of services and self-actualizing entrepreneurs that needed to act according to their interests. They did not have de facto rights to social and economic welfare provisions by the state, but they had to act to gain and realize their education, healthcare, and employment. This approach aimed to end the dependency on the state and promote accountability.

and competition between individuals. Society was ignored as a form of a collective life or as Margaret Thatcher noted in an interview in 1987 society did not exist. “There are individual men and women and there are families. And no government can do anything except through people, and people must look after themselves first. It is our duty to look after ourselves and then, also, to look after our neighbours.” she stated.

Thus, the state was not any more responsible for social welfare and equality of opportunities, but its role was to enable individuals in a space of social and economic competition. This way, it was replacing “the dependency culture with an enterprise culture”. For many analysts, this constituted the dismantling of the foundations of the British welfare state. For others, its restructuring. In any case, the classic welfare state came to an end and a new social and economic condition was established. This new condition moved away from the postwar consensus of full employment and social welfare and prioritized economic growth, the development of private enterprises, and the pursuit of individual interest. These changes that to the largest part of the 1980s brought unemployment and increased inequality, were received with social reactions and unrest. Interestingly, though, these reactions were relatively contained due to four main reasons: the actual welfare provisions that were in place diminished their impact and the changes in the legal framework of the function of unions contained any reactions. In parallel, there was a conversion of the Labour Party to embracing these new policies and most importantly, as the thesis has tried to show the rationalities and practices of the individuals had already altered and aligned with these priorities. This third way brought both (new) Labour and (new) Conservatives into a new consensus that opposed the interventionist welfare state policies. This new condition was a state or a regime of workfare rather than an actual welfare state.

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538 For analysts such as Claus Offe, capitalism cannot exist without welfare policies. The welfare state supports capitalism and modifies its consequences.

539 This became evident with the policies that the new labour implemented in the late 1990s during which, most of these initiatives were prolonged and extended.
Workfare was introduced in the USA by Richard Nixon in the late 1960s\textsuperscript{540}. In Britain, the Conservative governments of the 1980s dismantled the existing welfare policies and gradually introduced a series of labour-market programs that nurtured a workfare approach. However, they did not initially impose any explicit workfare policies to keep public expenditures low. These were established during the 1990s and were supported by both major parties. Workfare can be defined as "the imposition of a range of compulsory programs and mandatory requirements for welfare recipients with a view to enforcing work while residualizing welfare"\textsuperscript{541}. Peck in his book on Workfare States explains that "where welfare stands for the principles of needs-based entitlement and universality, workfare stands for market-based compulsion and selectivity. Where welfare stands for passive income support, workfare stands for active labour market inclusion. Where welfare constructs its subjects as claimants, workfare reconstitutes them as jobseekers\textsuperscript{542}. It aims to increase participation and eliminate dependency. Bob Jessop employs the term Schumpeterian workfare post-national regime in his analysis in order to underline that these policies facilitate a de-statization through the employment of non-state mechanisms. They rely on the development of horizontal networks and partnerships of governance and stress the permanent promotion of innovation and flexibility. This way, for Jessop the workfare policies manage to "subordinate social policy to the demands of labour market flexibility and structural competitiveness"\textsuperscript{543}. The workfare policies keep the workers close to the labour market, but at the bottom of it in order to serve the changing needs of the markets. They promote malleability and flexibility to the workers that have to be ready to work, under whatever circumstances and conditions. They need to earn their welfare by proving that they are ready to enter the labour market under any conditions. This way, workfare promotes a mode of existence that relies on risk, it is unstable,

\textsuperscript{540} Nixon mentioned workfare as part of his speech on public welfare reforms on the 8th of August 1969.

See: "Introduction" and Chapter 7 "Another New Deal. Workfare United Kingdom Style".

\textsuperscript{542} Ibid, 12.


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precarious, and open to exploitation as it helps to popularize a form of flexible underemployment. Most importantly, workfare requires that people earn their rights to welfare by being always proactive and “actualizing their potentials”. Individuals are considered as another form of enterprise that is to operate within a space of competition. The transformation of every aspect of life into a private economic enterprise that operates in a space of competition is characteristic of neoliberal governance. Indeed, workfare policies need to be considered as merely neoliberal initiatives.

The implications of these changes in the production and the nature of the architecture of the welfare state in Britain were both the result of the above policies and of the neoliberal practices and rationalities that had already developed within the architecture and government. As we examined in the previous parts, the architecture of the welfare state was under criticism and internal transformation since the 1960s. The controls in expenditures that began in the late 1960s because of the drop in economic growth and the parallel rise in the cost of construction, compromised the quality of the buildings produced and significantly restricted the parameters in the production of public architecture. This became initially evident in housing, where outdated or inappropriate construction methods were sometimes used, resulting in buildings of poor building quality. Nicholas Taylor in a text written in 1967 in Architectural Review entitled “The Failure of Housing”, stressed the fact that often the newly built houses were of worse quality than the old ones they were replacing544. Indeed, the partial collapse of Ronan Point tower block in south-east London, the following year, appeared as a proof for such a statement and raised further the existing skepticism in the architecture of the welfare state545 (Fig.4.6). The long delays in the plans for the construction of new towns, hospitals, and universities, fueled further the criticism on the effectiveness of state planning that had begun in the early 1960s. In 1969, Reyner Banham, Paul Barker, Peter Hall, and Cedric Price published in the New Society, the article “Non-Plan: An Experiment in Freedom”, which suggested that since there was rarely any actual control on the results of planning, a non-plan bottom-up approach to planning might be


545 Ronan Point tower block was built in Newham between 1966-1968, using the prefabricated large panel system. The building was constructed by Taylor Woodrow construction company for the local council as part of the Freemason Estate.
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better\(^{546}\). Later in the same year, the Architectural Review launched the Manplan publication (Fig. 4.7), which took its title from “a plan for human beings with a destiny rather than figures in a table of statistics”. \(^{547}\) Its first issue entitled “Frustration” reflected the existing feeling on public architecture and planning and was a call for more humane public buildings. By the mid-1970s, the public architecture of the welfare state in Britain was portrayed as being in crisis. Indeed, in 1974, the R.I.B.A. Journal published the report by Malcolm MacEwen, Crisis in Architecture, which underlined that the architecture produced by both the commercial and bureaucratic systems at the time, has lost any sense of the needs of people (Fig. 4.8).

![Fig. 4.6 – The partial collapse of the Ronan Point estate in 1968.](image)


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Fig. 4.7 – The first issue of Manplan was published under the title “Frustration.”.

Fig. 4.8 – The R.I.B.A. Journal report of 1974 on the Crisis in Architecture.
Charles Jencks in his famous text on "The death of modern architecture" that was published a few years later announced that modern architecture died with the demolition of the social housing of Pruitt-Igoe in 1972. In his analysis, he proposed a diagram of eleven causes that had contributed to the crisis of the two modern systems of architectural production (public and private)\(^548\). The diagram shows how the different parameters differentiate between a public and a private system of production. Among them, he lists some of the aspects that were previously analyzed in the thesis, the method of architectural design, the motivation, the problem of accountability, and the economic parameters of the project as constitutive to the crisis. Indeed, the last parameter proved to be of major importance in the production of the architecture of the welfare state. After 1975, cash became the measure in the planning of expenditures for the welfare, and cash limits were imposed. This replaced volume as a measure for the output of planning. Volume secured a standard result in architectural production. This was an important swift since inflation and changes in prices would influence the number and the quality of buildings constructed. As Nikolas Rose and Peter Miller explain: "when hospitals need to translate activities, laundry rooms, operating theatres into cash equivalents a new form of visibility is conferred upon them and new relations established - new procedures of decision making become possible"\(^549\). For example, in order to remain within the budget limitations, cheap materials of bad quality or inadequate systems were often used\(^550\). In parallel, the measurement in cash of the building production allowed for architecture to be included in managerial economic calculations and decisions in abstract forms that foregrounded its exchange rather than its use value. This way, the value of buildings and of the welfare architecture was measured, exchanged or limited as another form of capital that needed to be economically managed.

In 1970, the Ministry of Public Buildings and Works (M.P.B.W.) which was responsible for the majority of the construction of public buildings, and the supervision of the construction industry was dissolved. A small part of its


\(^{549}\) Rose, Nicholas and Miller, Peter, "Political Government beyond the State: problematics of government”, British Journal of Sociology, Volume no.43, Issue no.2, (June 1992), 173-204.

\(^{550}\) This cannot but bring into mind the recent tragedy of the Grenfell Tower fire, where the choice of the wrong insulation panels for economic reasons, contributed to the spread of the fire on the tower.
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responsibilities was transferred to the new Department of Environment (D.o.E.), but most of its functions regarding the building and management of public buildings were outsourced to an external agent, the Property Service Agency (P.S.A.), which was active from 1972 onwards. The same happened with the Ministry of Housing and Local Government that together with the Ministry of Transport became parts of the new department. This change was telling of the fact that the production of the built environment for the citizens was not anymore, the priority of the state as it was in the 1940s when these ministries were established partly to materialize the building programs of the state. The responsibility for construction had passed to private enterprises and the management of the buildings was outsourced. The state would only play the role of the supervisor and coordinator of such enterprises. In this sense, the measurement of architectural production in cash did facilitate these economic interactions between the state and the private sector, prioritizing the economic (for the ministries staying within their budgets and for the enterprises managing their profits) rather than the material and social results.

When Margaret Thatcher came into government, the changes that she introduced in the delivery of welfare provisions, affected further the building production for welfare. As we saw, the welfare provisions did not completely disappear during that time but were limited and restructured. The formation of internal markets in healthcare and education, that her governments initiated, meant that the ministries were not anymore directly responsible for the building and maintenance of hospitals, schools, and universities. The boards that managed these institutions became self-regulated and responsible for managing the buildings and operations of their institutions independently and according to their budgets and funding. This, in most cases, signaled a reduction in the quality of the built environment and a difference between the quality of services provided by the rich and poor institutions. The supplies for the production and service of these buildings were objects of commercial competition and were outsourced into the private sector. This was realized either by contracting out of government services or by eventually forming public-private partnerships. Public-private partnerships would involve long term contracts, with specific arrangements on risk and funding allocations, in which private companies would

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551 For more information on this see Lowe, Rodney, The Welfare State in Britain since 1945, 353-365.
make a profit by providing public services. The quality of services and buildings was not assured.

Under the Conservative governments of the 1980s, the role of the local authorities became restricted and fragmented. The Local Government Act of 1985 abolished the metropolitan councils including the Greater London Council and the wider planning interventions in public space were not anymore, a responsibility of the greater local authorities\textsuperscript{552}. The different local councils formed a series of joint committees to provide for local services instead and the funds were merely provided through grants. With limited resources the local councils and committees were forced to start operating as autonomous enterprises that pursued the most economically rational options for their projects. In the 1990s, the impossibility of maintaining existing buildings and infrastructures lead to either their sale or to the formation of public-private partnerships for their services. This was realized through the Private Finance Initiatives (P.F.I.), which were implemented in 1992\textsuperscript{553}, by the Conservative government of John Major. This approach also led to the eventual demolition of a large number of council buildings (often council housing) in order for the councils to acquire capital through the private development of the land to fund other initiatives. The buildings and land that belonged to the local councils and at the public domain decreased, in contrast to private building initiatives of offices, houses, and commercial buildings that expanded.

It is characteristic that one of the important initiatives of Margaret Thatcher’s as Prime Minister regarding the development of the built environment, was the creation of enterprise zones that operated outside the control of local governments\textsuperscript{554}. In enterprise zones, the government implemented policies to


\textsuperscript{553} “The Private Finance Initiative (P.F.I.) was announced with the aim of achieving closer partnerships between the public and private sectors. It was one of a range of policies introduced by the Conservative Government to increase the involvement of the private sector in the provision of public services. P.F.I. entails transferring the risks associated with public service projects to the private sector in part or in full. Where a private sector contractor is judged best able to deal with risk, such as construction risk, then these responsibilities should be transferred to the private sector contractor. Where the private sector is deemed less able to manage the project’s risks, such as whether demand will be high enough, then at least some of the responsibility must remain within the public sector.” House of Commons, Research Document 03/79, (21 October 2003).

\textsuperscript{554} These cannot but bring in mind the non-plan approach to planning that Price and Banham had proposed in their article.
encourage investments and economic growth in the form of incentives of infrastructure, flexible planning regulations, and tax breaks that would attract capital investment. Thatcher, who had lifted the previously existing exchange controls in order to allow for foreign capital to enter Britain, initiated the first enterprise zone in Canary Wharf in the decaying area of Docklands and the Isle of Dogs (Fig. 4.9). The London Dockland Development Corporation was formed by the environment secretary, Michael Heseltine in 1981 to regenerate the area. The enterprise that aimed to develop a complex of office buildings, was sold in 1987 to Olympia & York, a company owned by the Canadian developer Paul Reichman. While infrastructural provisions (such as the railway) and tax breaks were put in place by the British government to support the project. The area that developed through the building of office spaces for large corporations, shopping centres and luxurious housing complexes for the professionals, has become through the years the object of real estate speculation and private profit (Fig. 4.10). This has also affected the development of the wider area.

Fig. 4.9 – Margaret Thatcher with Paul Reichman in front of the model for the development of Canary Wharf into an enterprise zone.

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557 Although, the initial idea came from the chairman of Credit Suisse, Michael von Clemm.
Indeed, the practices of the central and local government in regard to the urban development and building production in the area, are explicit of the transformations that have taken place since the late 1970s. For example in Poplar, the neighbouring district opposite to Canary Wharf, which during the 1950s and 1960s was one of the areas, where extensive welfare infrastructures and social housing estates were established, the pressures from the economic and urban development of the wider area had two diverse effects; either the modernization and privatization of these estates, as characteristically has been the case with the apartments of the Balfron tower, which are sold nowadays as modernist design products or the demolition of existing estates to allow for larger and more contemporary private developments to be constructed, as has been the case with the Robin Hood Gardens estate that was recently demolished (Fig.4.11). In these initiatives, one can observe the efforts of central and local government to initiate building programs and urban development through the exchange of previously public buildings and land to private capital. This way, the role of the local councils has changed from providing for the public to enabling and guiding the development and growth of the private sector in hope of boosting the local economy.
These attempts to attract international business and investments became a form of urban strategy for the growth of towns and cities within the context of national de-industrialization and global techno-informational revolution. This way, entrepreneurship became an essential aspect of urban strategies. The technocratic managerial approach of the welfare state of the 1960s that the thesis examined, “has steadily given way to initiatory and *entrepreneurial* forms of action in the 1970s and 1980s”558. David Harvey explains that “In recent years in particular, there seems to be a general consensus emerging throughout the advanced capitalist world that positive benefits are to be had by cities taking an entrepreneurial stance to economic development. What is remarkable, is that this consensus seems to hold across national boundaries and even across political parties and ideologies.”559. Thus, the rationally planned development of the built environment according to the social needs of the citizens of the post-war period has transformed into a speculative enterprise in the pursuit of economic profit, where the public sector carries the risks and the private sector,

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559 Ibid.
the benefits. The cost of the incentives provided to attract these investments and the destructions that they sometimes cause, often outwrite the jobs and benefits that these developments offer to the local communities. Most importantly, these initiatives develop a form of governance of the urban space that is realized through diverse economic agents and politico-economic forces, transforming the urban space into a space of economic competition for the pursuit of private economic profit rather than a space of social welfare and equality. In this prioritization of economic profit, the built environment is measured and calculated according to its economic performativity. Most notably, the spaces produced by these private enterprises are calculated spaces of work, living, and entertainment, where the architecture itself directs its users in calculated activities of economic interest. This way, architecture implicates its subjects into the abstract machines of economic calculations. In addition, these initiatives produce either completely private spaces that exclude a large part of the population based on wealth and social criteria or they introduce private-public models of urban space, where there is private ownership and management of publicly accessed spaces and services. However, access and use take place under the conditions imposed by managers and owners. Thus, while open to the public, their use needs to align with specific controls and behaviours. Access can take place under specific conditions and becomes a personal responsibility, through the adjustment of one’s behaviour and activity. Of course, this is in direct contrast to the ways that public buildings, open squares, and parks, built by the state for the welfare of all the citizens, operated. This is characteristic of the transition from the spaces of equal opportunities, and care that the welfare state tried to provide to spaces of precariousness, competitiveness, and exclusiveness that describe the state of workfare. In these spaces, architecture is not anymore used to provide welfare and care to citizens, but instead to reflect and promote the conditions of economic competition and enterprise.

560 ‘Today, land and property in the U.K. is a patchwork of leasehold and freehold arrangements, with the old traditional landlords still owning many freeholds, while global finance institutions, central and local government and private individuals retain land and property both through leasehold and freehold. The huge sites of former heavy industry offer the greatest opportunities for new development owned and managed by a single private landlord’. Minton, Anna, The privatization of public space, (London: R.I.C.S., 2006).
For some analysts, these conditions are reflected in the architectural formation of the cities, from the phantasmagoria of market and entertainment spaces of consumerism to the corporate non-places of production and the excluded spaces of scarcity. For Fredric Jameson, this cultural logic of late capitalism, in architecture, “stages itself as a kind of aesthetic populism”, as “a new culture of image and simulacrum”, as “depthless and a total space of loss of any critical distance”. Indeed, the late 1970s and 1980s also marked the emergence of postmodern architecture. However, as we saw, one cannot fully grasp these changes through the stylistic metamorphosis of architecture. Neither should one solely see the changes in architectural styles as telling evidence of the changes in the socio-economic conditions and the conditions of the production of architecture. In fact, as the thesis has tried to demonstrate, architecture has been constitutive in these changes, and in the reorganization of life itself through the imposition of rationalities and practices that made it possible to realize this new form of neoliberal governance. The changes that are discussed above, had been possible exactly due to the calculative and managerial rationalities and practices that were developed in the British welfare state since the mid-1960s. The processes of administration, design, and production of institutional architecture became dominated by a technocratic logic that neutralized and often outsourced decisions to experts, losing sense of the social impact of its decisions. Most importantly, these practices facilitated a shift in the objectives and outcomes in the production and priorities of the welfare state, replacing the initial perceptions of equality and social value in design with those of economic gain, competition, and performativity. This way, the institutional architecture of the welfare state and the methods of its production were transformed into economic actions and de-politicized, making possible their managerial appropriation by the neoliberal policies that were examined above. In the following part, the thesis is going to briefly examine the nature of neoliberal governance and what it entails in order to eventually revisit its initial hypothesis of architecture as an apparatus of neoliberal governance.


562 Jameson, Fredric, Postmodernism or The Cultural Logic of Late Capitalism, 1-54.
4.2 An essential transgression: from liberal to neoliberal forms of governance.

The changes that took place in the British government during the late 1970s and 1980s and that the thesis examined in the previous part, aimed toward specific objectives and realized an important transition. They built upon preexisting technocratic and managerial practices and rationalities within the welfare state. However, as Dardot and Laval underline, these actions should not be considered as part of a preexisting plan. Instead, they emerged through specific conditions articulating scattered ideas and forces that existed in different forms within British society. This part of the thesis analyzes the characteristics and effects of this new form of government. Neoliberalism had been underway since the 1930s developing a new form of liberalism. As we saw, the formation of the British welfare state was a form of compromise of liberalism and a necessary consensus between diverse forces. The Walter Lippmann Colloquium that took place in Paris in 1938 had started working toward restructuring classical liberalism to what came to be neoliberalism by setting up an organization, the Comité International d’Étude pour le Renouveau du Libéralisme (C.I.E.R.L.), to promote liberal values. The following years, German ordo-liberalism initiated by Walter Eucken and Wilhelm Röpke and Austro-American neoliberalism developed through the ideas of Ludwig von Mises and Friedrich Hayek, were fully formulated. After the war, Hayek put forward the establishment of the Mont Pelerin Society that was formed in 1947. The society in its statement expressed its concerns on what it considered as a crisis of freedom, suggesting that socialism and the state threatened and limited personal freedom. A few years earlier, Hayek in The Road to Serfdom (1944) had already criticized central governmental planning as dangerous to individual liberty and initiative. However, the practices of neoliberal government that developed since that time, do not simply prioritize individual freedom. They do rely on the freedom of choice, but this choice exists to inform practices of competition and entrepreneurship. Neoliberalism is first and foremost a set of rationalities, discourses, practices, and apparatuses that organize human behavior in a space of liberty through the "generalization of competition as a behavioural norm and of the enterprise as a model of


564 German ordo-liberalism was based on the work of the Freiburg School of economic thought in the 1930s.
subjectivation for neoliberalism, all the domains of life are to be considered as enterprises. This achieves the extension and multiplication of the economic model of enterprise in all the aspects and operations of society, which can be aligned to those of the market. In the previous parts, the thesis examined in detail how these models and priorities of entrepreneurship and economic competition became part of the practices of the British welfare state and the production of its architecture, affecting the rationalities of architects, planners, policymakers and civil servants.

In neoliberalism, the homo economicus is transformed from a man of exchange to an entrepreneur that is for himself his own source of earning within the liberal economic space. The importance of the enterprise and the entrepreneur appeared in the eighteenth century and has been analyzed by many theorists such as Max Weber and merely in the Austrian school of economists by Joseph Schumpeter, Ludwig Von Mises, and Werner Sombart. In classical economics, the entrepreneur is first described by Jean-Baptiste Say as employing the economic factors of capital, labour and land and coordinating production in order to achieve financial profit. Another French economist, Richard Cantillon in the late eighteenth century underlined the aspect of risk and uncertainty that is related to the enterprise. Enterprise is one of the driving forces of economic development. Neoclassical economics in the nineteenth century put forward the idea that individuals make rational choices in the allocation of their limited resources and calculate the outcomes of their choices in order to maximize utility or profit. In this sense, individuals as entrepreneurs, carry the risk and responsibility of their choices. Each entrepreneur holding different resources and information can undertake different enterprises and produce commodities (in

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566 Classical economics developed in the late 18th century based on the ideas of Adam Smith that capital, labour and land were the determining economic factors. Economists such as Jean-Baptiste Say, David Ricardo, Thomas Robert Malthus, and John Stuart Mill developed the theories of a market economy.
567 Jean- Baptiste Say was a French economist and businessman (1767-1832).
569 Neoclassical economics developed in the late 19th century. They are based on the control of supply and demand and maximization of the utility of resources and of the income they can provide.
570 Fredrich Hayek, developed the idea of cultural evolution achieved through the spread and multiplication of enterprises that were based on different uses of knowledge. He considered this
the form of goods or services) that compete with those of other enterprises. The perceived value (which influences the exchange value) of a commodity is independent of the cost of production\textsuperscript{571}. The exchange value of a product is related to its usefulness (utility) and the market becomes the space of veridiction of this utility. This way, the market is understood as a space of competition between enterprises rather than a space of free trade. The pursue of individual profit and competition define the market.

The role of government changes in this context. It is to ensure the conditions of competition and to make the enterprises and the market possible\textsuperscript{572}. In this case, regulations and the state are to provide the framework for competition rather than to let the market operate on its own. Neoliberal government does not aim to cut out space for the market and let it operate by its own laws. It is not preoccupied as liberalism does with the limits of government. Neoliberal government accepts intervention by the state, but governmental practices need to be tested and considered in economic terms regarding their efficiency. Thus, neoliberal government has a completely other goal. This is to make the whole of society operate as a market, to be self-governed as a space of interest and competition. Competition and the pursuit of interests are assured through regulations that however do not intervene directly to the mechanisms of the market. The government is active and responsible for economic activity protecting competition from its own effects and eliminating any obstacles to it. This was characteristic of the regulations that Margaret Thatcher imposed during the 1980s as for example the legal framework posed to the unions. This way, neoliberal government becomes an issue of comfortable actions\textsuperscript{573}. These are interventions through regulatory actions on the conditions rather than the mechanisms of the market, as well as organizational actions, that aim to affect

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\textsuperscript{571} This is one of the main differences between classical and neoclassical economic theories.

\textsuperscript{572} For more on this see also Harvey, David, ‘The Neoliberal State’, A Brief History of Neoliberalism, (Oxford: Oxford University Press, 2007).

An essential transgression: from liberal to neoliberal forms of governance

the framework of economic operations such as population, techniques, training and education, legal framework, etc. Governmental interventions regulate heavily the social elements and lightly the economic ones. Thus, it becomes evident that this is a form of government that is fundamentally opposite to Keynesian economic planning, but also to some of the main principals of classical liberalism. Michel Foucault in his lectures at Collège de France in 1978-1979 (The Birth of Biopolitics), explains in detail these differences between classical liberal forms of government and neoliberal forms of government.

Indeed, Friedrich Hayek in The Constitution of Liberty (1960) and Milton Friedman in Capitalism and Freedom (1962), among many of the economists of the Chicago School, expressed a strong criticism toward the Keynesian welfare policies. Neoliberal government opposes such social policies. It lies in the belief that equality cannot and should not be the objective of social policies. Instead, inequality should exist as a constitutive element of competition. Neoliberals believe that social policy cannot be a counterweight to economic processes as this would interfere with them. Most importantly, there should not be any form of decommodification or socialization of consumption through welfare provisions. The welfare of people is an individual responsibility and should be taken care of by the economic growth that would provide adequate income to cover these needs through private institutions. So, neoliberalism puts forward a privatized social policy in which, the risk of illness and unemployment as well as the provisions for the old age, should be private responsibilities of each individual. The state has no responsibility for the wellbeing of its citizens. It is only responsible for the competitive operation of the economy. Through the form of privatized social policy, a lot of domains of life that within the welfare state were decommodified and accessible as part of citizens’ rights, become once again commodities that enter the processes of market exchange and are defined by the principles of competition. Therefore, the neoliberal government intervenes in such a way so that competition and enterprises become elements of all the possible aspects of society. It is not so much concerned with the exchange of commodities, instead it treats every aspect of life, the elements of the state, and

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574 The school initially represented neoclassical principles to economics and proposed monetarist policies. It focused on the control of inflation through the control of money supply, the flow and the circulation of money. This way economic growth would increase through the use of savings and investments. It also developed ideas on law and on economic applications in jurisdiction.
An essential transgression: from liberal to neoliberal forms of governance

every individual as an enterprise. Neoliberalism develops an analysis of human behaviour and personal strategies to increase competitiveness and entrepreneurship by viewing humans as another form of capital (human capital). This way, it extends the economic field into the previously social and non-economic domains, since the aim of every enterprise is profit. Milton Friedman, the American economist and one of the main advocates of neoliberalism, argued that an enterprise has no social responsibility. Its only responsibility is towards its shareholders in the achievement and sharing of profit. Thus, its only concern should be the increase in its profits. By multiplying the model of enterprise and expanding it, all aspects of life become oriented toward private interest and profit.

As we saw, according to Ludwig Von Mises and to classic liberalism, the operation of an enterprise is completely different to that of administrative (state) affairs and government, in the sense that the last ones do not pursue profit and are not considered in monetary values. However, since the 1970s, as the thesis described, there was an expansion of the calculative logic of the enterprise in the practices of government and in the production of the state architecture. Everything is considered a commodity and profit is to be made possible through every possible action that is viewed as an enterprise. Under this logic, enterprises and private corporations are to substitute the functions of the state through the services they provide and from which they gain profit. Political and social objectives and values are replaced by economic ones aiming towards individual financial rather than social profit. The role of the state in the protection of social rights and the provision of services to society disappears. The logic of private profit driven enterprises defines previous social provisions. This way, many of the welfare services become commodities that are driven by the logic of maximizing the profit of providing companies. People lose their social rights of education, employment, housing, and healthcare, which need to be bought. Public institutions and welfare practices become enterprises that have to make a profit. In this process, citizens become consumers of services that they often cannot


An essential transgression: from liberal to neoliberal forms of governance afford, and social inequalities are enhanced. Nonetheless, for neoliberalism inequality is desired as it increases competition between people so that they take entrepreneurial initiatives and expand the operations of the market.

In contrast, the welfare state by providing for the well-being of the population is considered to render people dependent on the state and irresponsible of their lives. By withdrawing the provisions of the state and making the individuals responsible for their life, individuals can develop forms of self-conduct that are responsible and calculative. They are free to choose, but also responsible to calculate how to cover their needs and achieve their interests and desires. Incentives that activate individuals and direct their choices through the setting of performance evaluations and objectives are also employed towards these ends. “It is therefore no longer a question, as it was in welfarism, of redistributing goods in accordance with a certain regime of universal rights to life – that is, health, education, social inclusion, political participation – but of appealing to the calculating capacity of subjects to make choices and achieve results, which are posited as conditions of access to certain well-being. This presupposes that to be ‘responsible’, subjects possess the data for this calculation, comparative indicators, quantitative expressions of their activity, or, more radically, of the monetization of their ‘choices’.” It is therefore no longer a question, as it was in welfarism, of redistributing goods in accordance with a certain regime of universal rights to life – that is, health, education, social inclusion, political participation – but of appealing to the calculating capacity of subjects to make choices and achieve results, which are posited as conditions of access to certain well-being. This presupposes that to be ‘responsible’, subjects possess the data for this calculation, comparative indicators, quantitative expressions of their activity, or, more radically, of the monetization of their ‘choices’578. Thus, individuals need to make the best use of their resources, manage the risks they take, develop means of self-protection (for example through training) and prove themselves in a space of competition. People are considered in terms of their specific abilities that become forms of capital resources that need to be activated according to the needs of their environment579. For this purpose, differentiation is essential and useful. They need to adjust the ways they operate depending on the existing conditions and their best interests. Individuals as entrepreneurs are persons who accept reality, use its givens in the best possible way, and take risks. They respond to reality and adjust to it. In this sense, one could say that they are manageable and governable according to the changes in conditions580. The individuals modulate and adapt themselves and their behavior according to the changing competitive


579 Opposed to the Marxist analysis of people considered through their ability to produce abstract labour power, neoliberalism considers people as a form of capital carrying specific qualities.

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environment. This way, the individuals are divided within by the constant objectives, requirements, and tasks of their competing enterprises. They become calculated and calculative individuals.

Interestingly, these principles of neoliberal government have been established to individuals to a large extent through the expansion of technocratic and managerial regulations and practices that the thesis examined in the second part. The deployment and multiplication of practices and rationalities that employ specific techniques of government (through for example the prioritization of performance, of evaluation, and accountability) eventually appoint a specific direction and push toward specific objectives. We examined in the previous parts, the appearance of this kind of techniques into the government policies of the welfare state and also defined them in the practices of architectural design in the late 1960s. These practices form a common language, they act as technologies of government that exist and expand within diverse fields. It is the gradual expansion of these practices and rationalities that resulted in the formation of a new regime of governance. Thus, one could argue that the transition to neoliberalism was made possible through both the realization of specific regulatory changes in the operation of the state and the market, that we examined in the previous part, but most importantly as the thesis demonstrated in its analysis, through the expansion and development of specific practices and rationalities that had begun much earlier in the 1960s. Thus, the transition that took place, was not only due to the changes in the operations of capitalism but also due to an ideological and cultural transformation that was realized through the exercise of specific practices, rationalities, and forms of conduct. As Dardot and Laval confirm: "The most salient factor in the neo-liberal turn was not so much the ‘retreat of the state’ as the change in its modalities of intervention, in the name of ‘rationalizing’ and ‘modernizing’ enterprises and public administration. And, from this point of view, the most significant role was perhaps played less by converted media intellectuals and journalists than by submissive experts and administrators who, in the various areas for which they had responsibility, put in place the new apparatuses and modes of management peculiar to neo-liberalism, presenting them as new political techniques motivated solely by the pursuit of beneficial effects for everyone."^681 Thus, "We

An essential transgression: from liberal to neoliberal forms of governance should not be misled: neo-liberal policies were implemented in the name not of the ‘religion of the market’, but of the technical imperatives of management, in the name of the effectiveness, even ‘democratization’, of systems of government action. Elites converted to the rationalization of public policy played the major role, obviously aided by the apparatuses for manufacturing consent that transmitted their arguments in favour of ‘modernity’582. In the previous parts of the thesis, we examined in detail how these technical and managerial imperatives were formed within the state administration, architectural education, research, and practices, but also how they were materialized as architectural spaces. Concepts of effectiveness optimization and good practice neutralized decisions, nurturing depoliticized technocratic mentalities that were directed towards economic ends. Moreover, these calculative practices and rationalities of technocratic managerialism by forming abstract machines of calculations manage to connect the different spheres of life and impose the same economic principles into diverse domains. Most importantly, they nurture an internal calculative rationality to the individuals that apply these ways of thinking and practicing in all the aspects of their lives.

This way, neoliberal government replaces the social and economic planning of the state with the regulation of the institutional framework and the imposition of specific rules of practices to free agents within society in order to self-govern themselves583. This form of government reminds us of David Graeber’s theory of the Iron Law of Liberalism584, where he describes the totalization and expansion of bureaucracy, of rules and regulations in all aspects of private life. Therefore, the neoliberal government achieves through intervention on the institutional and legal frameworks of society to sustain competition and to expand the logic of the enterprise in all the aspects of life within society. Neoliberalism becomes a form of horizontal and individualized governance rather than a top down form of government. Nevertheless, it is anchored on practices that pursue self-interest and economic profit, disregarding other forms of value, they erode social rights

582 Ibid., 182.
583 As Foucault explains, relying on the ideas of Schumpeter, in capitalism the social problem of competition and of the concentration of wealth and power, eventually leads to forms of socialism. However, as planned economy signifies the loss of personal freedom, legal and institutional interventions are required to avoid this and maintain the logic of capitalism and of competition. Ibid. 159-185. See also: Reisman, David, Schumpeter’s Market: Enterprise and Evolution. (Cheltenham, U.K.: Edward Elgar, 2004).

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and enhance inequality. Thus, one could argue that neoliberal governance, in the way it has been realized through the gradual dismantling of the British welfare state and the emergence of a state of workfare, constitutes an essential transgression of the liberal forms of governance, since it intervenes in all the aspects of human life, imposing the values of the market and compromising individual and collective freedoms. It is exactly there, that apparatuses play a crucial role as they capture individual freedoms and direct the formation of subjectivities towards specific ends by imposing mechanisms of control and implementing technologies of government that link the economies of the subject to the purposes of the neoliberal political economy. This way, they carry a key role in the deployment of neoliberal governance. In this sense, the scientification and technicization in the production of the institutional architecture of the welfare state in the 1960s, which the thesis analyzed in the previous chapters, prioritized economic calculability, and performativity and played an essential role in activating architecture as apparatus of neoliberal governance and in establishing new priorities within the state.
4.3 Afterword: Architecture as an apparatus of governance.

The thesis in its investigations and analysis presented how architecture has been constitutive in the development of neoliberal governance through its ability to operate as an apparatus. In order to demonstrate this, it examined some of the practices that brought the British welfare state to a state of workfare. The thesis also demonstrated how the architecture produced for the state, altered the ways it addresses the subject during this transition. Initially, the architecture of the welfare state inscribed the subject as a citizen with civil, political and social rights within space, but eventually, through the transformation of its practices and modes of production, architecture started to implicate the subject in operations of calculated division (dividuality), constituting it manageable and enforcing within it a logic of economy and self-regulation. By doing this, the subject became governable through modulations in space that are adjustable to the calculated prescriptions of the market, which tend to be invisible. While the organized and visibly defined institutions of the welfare state and their architecture that existed in absolute space were gradually disintegrated into the relative space of exchange and the relational space of modulations\textsuperscript{585}.

This transformation and crisis of the institutions is characteristic of the redirection in the practices of government from what Foucault had named as disciplines towards security and control. Gilles Deleuze describes this in the Postscript on the Societies of Control:\textsuperscript{586} “[... ] the disciplines underwent a crisis to the benefit of new forces that were gradually instituted and which accelerated after World War II: a disciplinary society was what we already no longer were, what we had ceased to be. We are in a generalized crisis in relation to all environments of enclosure – prison, hospital, factory, school, family [... ] The administrations in charge never cease announcing supposedly necessary reforms: to reform schools, to reform industries, hospitals, the armed forces, prisons. But everyone knows that these institutions are finished, whatever the length of their expiration periods. It is only a matter of administering their last rites and of keeping people employed until the installation of the forces knocking at the door. These are the societies of control, which are in the process of replacing the disciplinary societies.”\textsuperscript{586} The dismantling of the welfare state and

\textsuperscript{585} For the definitions of absolute, relative and relational space see page 149 of the thesis.
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the alteration of its architectures can be considered as part of such a reform, which was initiated by the replacement of the closed systems of institutions with modulations within open systems through processes and mechanisms of control. These processes of control rely as we saw, on calculations, and on a numerical language. They are continuous and allow for the integration of the logic of the enterprises and of the economic priorities of the market in all the domains and aspects of life. Nonetheless, as the thesis demonstrated, control and security are forms of governance that are exercised within a space of freedom. It is a governance beyond the state that develops through the calculated organization, arrangement, and interrelation of diverse entities. As Erik Swyngedouw underlines "the externalization of state functions through privatization and deregulation (and decentralization)[...]inevitably imply that non-state, civil society or market based configurations become increasingly involved in regulating, governing and organizing a series of social, economic, and cultural activities". Thus, governance deploys as a horizontal network that implicates different scales and entities while it focuses on the administration, managerialization, and technisization of social and economic life. This way, a neutralization of previously political issues is achieved, and the exercise of specific practices and rationalities can be put forward.

These practices and rationalities implement and activate specific technologies of government that "conduct the conduct" of people, making possible a form of self-management and a governing at distance. As Mitchell Dean has observed: "From the perspective of advanced liberal regimes of government, we can witness the utilization of two distinct, yet intertwined technologies: technologies of agency, which seek to enhance and improve our capacities for participation, agreement and action; and technologies of performance, in which these capacities are made calculable and comparable so that they might be optimized. If the formers, allow the transmission of flows of information from the bottom, and the formation of more or less durable identities, agencies, and wills, the latter, make possible the indirect regulation and surveillance of these entities. These two technologies are part of a strategy in which our moral conduct and political

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can be put into play as elements within systems of governmental purposes\(^{589}\). Technologies of agency rely either on the principle of contract or on the responsibilisation of individuals as professionals, consumers, users and citizens, able of taking control of their own activities and lives as other forms of enterprises. This way, there is a transfer of responsibility from the state to the individual with a parallel establishment of multiple centres and agents of self-management and self-government. However, it is the technologies of performance that activate these centres and render calculable and accountable all forms of practices, spaces, and individuals. They impose processes of optimization and self-assessment transforming the citizens into ‘calculating individuals’ operating within ‘calculable spaces’, subjects to ‘calculative regimes’\(^{590}\) that set specific norms, standards, measures, and controls. Although these norms are externally imposed, the responsibility of the performance is transferred to the individuals. Performance is linked to a condition of risk regarding one’s security and welfare, establishing a mechanism of constant control on individuals. This is especially evident in states of workfare, where people need to perform in a specific way to gain access to welfare provisions. The thesis examined how both these technologies of government were implemented in the practices and the production of architecture for the welfare state during the 1960s through the development of the calculative rationalities and practices of technocracy. This way, they contributed to the transition toward a state of workfare.

Through the operations of these technologies of government “a consensual arrangement”\(^{591}\) and an agreement becomes possible. “With the new regime, multiple agencies seek to put our actions into play so that they might be acted upon and rendered calculable and comparable, and so that we might optimize our capacities for performance as various types of persons and aggregations”\(^{592}\). Through this imposition of calculability and performance, the logic of enterprise and competition is implemented in all actions. Moreover, as the standards of performance are directed and imposed by the market, the new arrangement

\(^{589}\) Dean, Mitchell, Governmentality, 202.

\(^{590}\) Miller, Peter and Rose, Nikolaas. “Political Power beyond the State: Problematics of Government”.

\(^{591}\) Swyngedouw, Eric. “The Post-Political City”.

\(^{592}\) Dean, Mitchell, Governmentality, 202.
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aligns individual priorities and objectives to those of neoliberal governance. Hence, neoliberalism is realized as a horizontal and individualized form of governance rather than a top-down form of government. The thesis demonstrated that architecture has been constitutive in the deployment of this form of governance through the reorganization of collective life. This became possible by employing rationalities and practices that form spaces and implicate subjects in ways that implement technologies of neoliberal governance on different levels. This way, it would be accurate to consider architecture as an apparatus that makes possible the application of certain technologies of government through the imposition of abstract machines of calculations and the production of calculated spaces and calculating subjects.

It is under this perspective that the questions initially posed by the thesis need to be revisited. The thesis began with the research hypothesis that architecture can operate as an apparatus of governance and in order to address the problems of techniques, practices, and rationalities through which governance operates, it put forward questions of how. The initial question that the research posed was how does architecture operate as an apparatus of governance? So how are we governed by architecture and how do we govern through it? How does architecture configure and orient our behaviour and actions? Which are the variables involved in such a process? Which are the architectural properties, design mechanisms, technologies, rationalities, and norms that frame and guide our operations, conceptions, and sensibilities? In order to answer these questions, the thesis focused on the examination of specific formations and operations of architecture as an apparatus of governance within a specific milieu, that of the British welfare state in the late 1960s. It considered architecture as a product of the political economy of the time and problematized the transition from the welfare state to the state of workfare. Within this context, the research questions of the thesis became more specific: How architecture as an apparatus of governance contributed to this transition? How did specific operations of architecture facilitate this transition and put in place new forms and modulations that are aligned with neoliberal governance? Thus, how have the operations of architecture as an apparatus of governance been constituent in the formation of neoliberal governance?
In order to answer these questions, the thesis scrutinized specific architectural case studies, which it linked to related governmental reports and policies. This way, it drew a parallel between governmental and architectural practices. Informed by material from diverse disciplines, the thesis unraveled the complexity of considering architecture as an apparatus and found the points of congruence of the diverse trajectories. In this investigation, archival and bibliographical research has been informative and operative. Through the examination of the Whitehall plan for a new national and government centre for the British welfare state, the thesis demonstrated how the plan operates as an apparatus by partaking in the subjectification of its users as social citizens, while at the same time by implicating them in its design calculus, it desubjectifies them. The subjects of the plan as divided subjects (dividuals) are positioned within the larger assemblage of calculations and scientific practices of the architecture of the welfare state. They are affected by the abstract machines of calculations that transverse the architectural apparatus and which direct, their practices and behaviours toward specific ends. This way, the thesis exposed the complexities and contradictions within the operations of the British welfare state, which on one hand, promoted the welfare of the citizens, while on the other, addressed them through processes of technisization and scientification as objects of calculations.

Through the investigation of the architectural research at the L.U.B.F.S. centre in Cambridge, which was produced at the time with the support of the welfare state, the thesis was able to scrutinize the scientific rationalities and practices in both the operations of the welfare state and in the production of its architecture. The thesis determined how these practices contributed to the transformation of both architecture and government through the development of calculative practices and rationalities that in reality carried a neoliberal technocratic mentality. These practices that developed within the welfare state achieved to alter it from within by implementing specific technologies of government (of performance and agency). Interestingly, it was these same practices that also transformed the architectural design into a rational economic action and reclaimed the architecture of the welfare as a commodity that is defined by its exchange value, reincorporating within the mechanisms of capitalist market. By drawing a parallel between these calculative and scientific practices in government and architecture, the thesis showed how calculations can act as abstract machines.
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that connect these two fields and activate architecture as an apparatus of governance.

Following this analysis, the thesis can now provide some answers to its initial questions. The thesis can claim that architecture was activated as an apparatus of governance through the formation of abstract machines of calculations that linked institutional architecture to governance. These calculative practices and rationalities implemented technologies of performance and agency that partook in the formation of calculated spaces and calculative subjects. They promoted performance optimization, entrepreneurship, competition, and risk management in the production of the institutional architecture of the welfare state, developing an approach that replaced every social value with economic ones. This way, the production of public institutional architecture, was transformed into a form of enterprise that was eventually determined by the economic criteria of the market and the pursuit of profit. This appropriation of the welfare state architecture by economic priorities led to its dissolution and contributed to the formation of urban spaces of inequalities, exclusion, and precariousness. The calculated spaces of neoliberalism promote the inscription of subjects within them as calculative economic entities rather than as citizens with social rights. This way, they form spaces of economic entrepreneurship and competition rather than spaces of social welfare and equality. These spaces are operative in the deployment of contemporary neoliberal governance.

Architecture, despite its claims for autonomy, is a historical formation that implicates and participates in the social, economic, aesthetic, and technical practices and considerations of its times. Through the above analysis, the thesis demonstrated that architecture needs to be considered as a multilinear whole, a complex of technologies, discourses, norms, and protocols. The thesis scrutinized architecture in its specific historical formation against universals and exposed its ability to partake in the processes of subjectification and desubjectification. Most importantly, the thesis traced the ways architecture mediates between political economy and the possible economies of the subject. This way, it unraveled the operations of architecture as an apparatus of governance and proved its initial hypothesis. Understanding architecture as an apparatus of governance has helped to enlighten the role of architecture in the practices of government.
The thesis has brought together the analysis of architecture and government and exposed their points of confluence. This way, it has added on the histories and analysis of both these fields. Moreover, through the exposition of this historical research, the thesis provides a critical understanding of the present condition. In this sense, it presents a history of the present that aims to problematize and address the dismantling of the British welfare state and the current neoliberal condition, helping to equip and prepare for the future. The thesis addresses the lack of literature on the history and analysis of the architecture of the British welfare state and contributes to its development. It contributes not only by providing historical research but also by critically reflecting on the problematics of the architecture of the welfare state. It exposes the role of architecture and of the built environment in relation to the development of social policies. This way, it also participates in and expands the wider history of the welfare architecture of the Western states that has recently started to be written. The thesis also contributes by providing an analysis of the changes that took place in the British institutional architecture from the postwar period until the recent past. It achieves this, by mapping the transition of it from the welfare state to the state of workfare. In this mapping, the thesis attempts to overcome the polarized dichotomy between public and private, state and market, modernism, and postmodernism. Instead, it analyzes architecture as a mediator between the political economy and the economies of the subject. This way, it proposes a different point of viewing and understanding this period.

Another important and original element that the thesis presents is archival material that has not previously been exposed or analyzed in its details. This material expands and supports the historical and bibliographical research of the thesis, by exposing historical evidence in their detail and specificity, enlightening the relations between architecture, government, industry, and academia. This way, the thesis can also add to the analysis of the architecture of bureaucracy and the formation of spaces of administration and production. The findings of the thesis can also inform the histories and analysis of architecture regarding its relation to sciences, technology, and computing. The thesis, for example, provides historical material that describes the initial stages of architectural computation. The same material could contribute to forming a history of architectural research and education in Britain.
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The originality of the thesis lies exactly in its transversal approach. The thesis describes and analyzes the development of diverse but intersecting fields. It is informed by diverse disciplines; from mathematics, science, architecture, political theory, philosophy, law, history, and economics. Thus, it presents research that transverses the mere discipline of architecture and exposes the complexities of its operations. The thesis by reflecting on the methods, rhetoric, and technologies of architecture and putting them in relation to those of other fields, it demonstrates that often common principles of practice dominate different disciplines toward similar ends. In this sense, it puts into question and problematizes the purposes and values of architectural production since it positions it within its socio-economic context. By unraveling the different multidisciplinary lines of an architectural apparatus in order to analyze its operations within the practice of governance, the thesis demonstrated the dependence and interrelation of architecture to other disciplines and the impossibility of its autonomy. This leads us to revisit the social and political agency of architecture and “to think about architecture as always — inescapably and necessarily — a form of mediation, a power within and for capitalism in the production of subjects; a mode of subjection related to a mode of production where the problem is not production per se, but the ends its serves within capitalism”.

Having demonstrated the ability of institutional architecture to function as an apparatus of governance and the ways that architecture became operative in the formation of neoliberal governance, the thesis concludes by returning to its initial hypothesis. It will briefly reflect on the role of architecture as an apparatus and in regard to its political agency. Giorgio Agamben stresses the multiplication of apparatuses in the contemporary societies and expresses the need for the liberation and the reconstitution to the common use of what is captured and separated from the subjects through the processes of subjectification and desubjectification that all apparatuses impose. He names this attempt of liberation as an act of profanation of the contemporary apparatuses. So how are we to address architectural apparatuses? Agamben explains that the problem of apparatuses lays at the fact that the formation of each apparatus defines its

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593 Spencer, Douglas, “Architecture and the Other Scene”.

operation and process of subjectification, which cannot be reduced to the issue of correct or incorrect use (of architectural, technological apparatuses, etc.). Keller Easterling, who has theorized architecture as an apparatus, has proposed that architecture and design carry the ability to intervene in the dispositions of the architectural and urban apparatuses. This can happen through the development of a web of “active forms” that have the ability to employ a systems’ discrepancy in order to manipulate and alter the directions of existing assemblages. This way, she suggests that architectural design can redirect the apparatuses of governance towards different ends. And proposes not escaping but altering the existing apparatuses. For Easterling, architecture is capable of achieving these transfigurations through its form, disposition, and design. However, what Easterling proposes cannot be possible since architecture (as an active form) can only control and manipulate specific forces and aspects of its formation. For Nadir Lahiji, who considers that architecture has lost in the last three decades its capacity to produce political subjectification because of the development of architectural dispositifs, the political agency of architecture lies in its ability to produce aesthetic experiences that interrupt the operations of these architectural dispositifs and allow for political subjectification to occur.

Following Jacques Rancière’s proposal for an aesthetic “redistribution of the sensible”, Lahiji suggests that architecture and buildings can disrupt the ordinary and produce egalitarian aesthetic experiences that reconfigure the sensible, providing visibility, voice and equal opportunities to all in the space of the city. However, architecture can only intervene temporarily and locally in such aesthetic reconfiguration of the sensible. As Tafuri has underlined in Architecture and Utopia, “it is useless to propose purely architectural alternatives. The search for an alternative within the structures that condition the very character of architectural design is indeed an obvious contradiction of terms.” Therefore, it has become all more urgent to challenge and intervene in the material and political parameters that condition architectural production.

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595 Easterling, Keller, Medium Design.

596 Lahiji, Nadir, “Political Subjectivation and the architectural dispositif”, Architecture Against the Post-Political, Essays in Reclaiming the Critical Project, 61-63.


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and which are constituent in the formation of architectural apparatuses. Towards this end, the problematization of the conditions of production and architectural labour and the political subjectification of all of those who are implicated in the production of the built environment becomes an essential task. Thus, we need to turn our attention to the material and socioeconomic aspects of the production of architecture rather than solely to its formal and aesthetic ones. Indeed, it was the active exercise of politics and the challenge of the existing conditions of production in the postwar period that led to the compromise of liberal capitalism and achieved the formation of the welfare consensus that produced an architecture for the welfare of most citizens. Thus, the conclusion that we need to draw from this examination of the welfare state and with which we can close this thesis is that the production of architecture for the welfare for all can only become possible by reconfiguring the social, economic, and political forces within society through actual political praxis.
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Fig. 3.33 - Her Majesty’s Stationary Office.

Fig. 3.34 - Association of Scientific Workers. Science and the nation - Pelican Books, 1947 - 1st Paperback Edition.

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Fig. 4.11 - James D. Evans - Architectural Photography / Alamy Stock Photo.
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