Introduction

The sovereign nation-state has been the central subject of inquiry in the discipline of international relations (IR) since its inception in the early twentieth century (Lake 2008: 41). So much is clear from the discipline’s name: international relations. It is no small surprise, therefore, that IR scholars and theorists have until relatively recently neglected to thoroughly investigate the historical evolution of the very concept of the state. Many theorists have pointed simplistically to the Peace of Westphalia, or identified the medieval, and particularly the Italian, city-states as the origin of the modern system of states. At other times, the work of scholars external to the discipline has proved influential. Charles Tilly and his famous conclusion that ‘war makes the state’ (1985: 170) is an example of the latter.

This essay is premised on the view that material accounts, such as Tilly’s, suffer from an overemphasis on the state as a coercive, rather than an authoritative, institution. That emphasis can to some degree be corrected by focussing on the important concept of legitimacy as it applies in relation to sovereign states. The question posed here is: how, historically, has the state become the sole legitimate form of polity? The thesis of this essay is that the answer to this question lies in two interrelated legitimation processes. One is the internal process of legitimation whereby the state attains popular allegiance by securing its subjects’ welfare while – and, to some extent, through – enabling checks to be placed on its own power. This is the process of constitutionalism. The second process of legitimation is external and concerns the recognition states afford one another, which allows them to self-identify as distinct political entities. Nowhere has this process been more on display historically than in post-war peace conferences among states and their officials. In sum, it is the combination of these two processes that has seen the state become the unrivalled legitimate form of political organisation.

The structure of this essay is as follows. The first section lays the broad theoretical foundations of legitimacy that undergird the overall analysis presented. The second section details in general terms the internal process of legitimation – constitutionalism – before undertaking a case study of its modern origins in the development of British governance structures throughout the seventeenth century. The final section outlines the theory behind the process of recognition among states and briefly discusses the Peace of Westphalia in this context.

Theoretical Preliminaries: Legitimacy and the State

An appropriate starting point for a discussion of the state and legitimacy is Max Weber (Beetham 1991: 8). Weber famously defined the modern state as ‘a human community that (successfully) claims the monopoly of the legitimate use of physical force within a given territory’ (Weber 1958: 78). Interestingly, international relations scholars have tended to emphasise the significance of the ‘territory’ and the ‘monopoly on physical force’ aspects of the Weberian definition (Herz 1957: 474; Ruggie 1993: 151). Indeed, according to Seabrooke (2002: 1, 7), even prominent sociologists such as Theda Skocpol (1979: 31) have downplayed the role of legitimacy in the process of state formation. The corollary of this has been the tendency to treat the question of whether a monopoly on the use of physical force exists within a given territory as largely determinative of the question of whether the relevant monopoly-holder is legitimate. For instance, Tilly’s argument that states formed through varying degrees of capital- and coercion-intensive processes of extraction almost presupposes the legitimacy – a word which does not appear in his work Coercion, Capital, and European States AD 990-1992 – of the state by
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focussing narrowly on its agentive capacities to wage war (1992: 14-5). While Tilly recognises that the state acted within boundaries set by others, the important point for him is that it acted nevertheless.

Some more recent scholarly work has utilised the concept of legitimacy as an explanatory tool, though primarily for the analysis of the fundamental bases of international organisations and institutions rather than state formation (Bodansky 2012: 321-322; Clark 2005: 12). This is curious, as Weber himself went to great lengths to explain the importance of legitimacy in the emergence of states (Bendix 1966: 294-297). His conclusion was somewhat tautological: a regime is legitimate if its citizens hold the belief that it is (Grafstein 1981: 457). This represented a break from the traditional philosophical understanding of legitimacy as referable to objective moral standards, albeit standards on which philosophers disagreed (Beetham 1991: 7-8). However, as Beetham notes, the Weberian view is unable to explain why it is that people’s beliefs in the legitimacy of a state (or other institution) change (1991: 11-12). To do that, according to Beetham (1991: 11-12), one needs to identify the reasons for the belief – the efficacy of the relevant entity at securing citizens’ welfare without sacrificing what they consider to be their rights, for example – so that one can assess the extent to which it objectively does and does not live up to that subjective belief.

In this respect, a crucial part of the emergence of sovereign statehood, at least at the domestic level, was ‘the recognition of the need for a final authority, not the possession of a “monopoly of power”’ (Strayer 1970: 9). This is not to deny that there is ‘a causal influence…between power and the process of its legitimation’ (Beetham 1991: 104), but it does suggest that such influence is not absolute, and not entirely in one direction for power in turn can derive from the legitimacy of an actor (Reus-Smit 2007: 160-165). This is why ‘[a]mong statesmen, the lovers of naked power are far less typical than those who aspire to clothe themselves in the mantle of legitimate authority’ (Claude 1966: 368, cited in Reus-Smit 2007: 161). It thus appears that statesmen have internalised Machiavelli’s dictum there are two principal and connected ways of fighting: through law – encompassing ‘rules, norms, principles and moral conventions’ – and through war (Machiavelli 1999: 56, cited in Phillips 2010: 15).

In sum, a consideration of the material power states accumulated is incomplete without an appreciation of how their legitimacy was established. As will now be discussed, that was the result of two processes; the first of which involved the endowment of the state with authority of a distinctive character through constitutionalism.

Constitutionalism As an Internal Process of Legitimation

Constitutionalism: Thought and Practice

At its most fundamental, constitutionalism refers to the process by which states are both endowed with, and restricted in their exercise of, legal power (Gordon 1999: 5). It is therefore unsurprisingly a notion intimately related to the concept of ‘sovereignty’, itself practically coterminous with the modern state (Hinsley 1986: 2). For this reason, the implicit understanding by some scholars of sovereignty in absolutist terms leads to an emphasis on the coercive rather than the authoritative dimensions of state rule (Reus-Smit 1999: 92-3). For example, while Tilly (1992: 75) briefly mentions the creation of courts, public assemblies, treasuries and the like, they are deemed significant only insofar as they are attributable to the efforts of rulers in preparing for war.

Such a view rests on a simplified understanding, if not neglect, of the import of constitutional developments, albeit ones which occurred at different times in different places, since the middle of the previous millennium. A constitution is here defined as ‘an institution that allows societies to construct and articulate power as the power of states’ (Thornhill 2011: 11). As an institution, a constitution can be understood as comprising both normative and procedural elements (Fukuyama 2011: 259-260). In other words, a distinction can be drawn for analytical purposes between constitutional thought and practice, and an argument made that the modern state formed as a consequence of a particular combination of the two. That combination entailed constitutional thought about the source, proper use and legal constraints on the exercise of public power, and constitutional practice in which powerful institutions and rulers, often after violent upheaval, began to bow to such constraints. By doing so, rulers were at times constrained in their freedom of action, but their rule was legitimised and their authority enhanced. According to the argument advanced here, the distinctive character of the state and state power thus emerged.
The first important development in constitutional thought concerned the source of rulers’ power. Put simply, their power derived in broad terms from the people over whom they governed. Rulers were no longer seen to possess a private right to control a subject population however they wished (Strayer 1970: 13-15). The power they exercised was public power, and it inhered in the first place in the people who themselves were sovereign (Gordon 1999: 29-36), and in the second place in their representatives such as they were. It followed that the purposes to which such power ought to be put were not the private interests of the ruler but the public needs of the people; patrimony was in gradual decline. A ruler had an obligation to secure order among, and the welfare of, their subjects – an idea smothered in religious overtones that would only gradually recede in the face of notions of natural individual rights (Holsti 2004: 34). The corollary of such thinking about the source and proper uses of power was that rulers had to accept and abide by legal constraints. The shift from Bodin’s definition of sovereignty as ‘supreme power over citizens and subjects, unrestrained by law’ (Sabine 1937: 405) was clear. The end result of these developments was the conception of the state as existing independently of its rulers (Lane 1996: 22). Louis XIV’s apocryphal statement that ‘l’etat, c’est moi’ no longer held.

Constitutional practice largely reflected constitutional thought – an unsurprising state of affairs given that a necessary precondition for the maintenance of a constitutional order is that ‘fiction’ must sufficiently resemble ‘fact’ (Morgan 1988: 14). Indeed, this parallels Walzer’s suggestion that a state ‘must be personified before it can be seen, symbolized before it can be loved, imagined before it can be conceived’ (1967: 194). In very general terms, rulers recognised that their powers were constrained as a result of the supremacy of law; they recognised the independence of other institutions of government, public assemblies and the courts, and that in certain circumstances they would have to defer to these bodies; and they recognised that they owed the public – a body whose interests did not necessarily cohere with their own – certain obligations (Strayer 1970: 110-111). Debate raged then as now over the precise implications of these ideas, but the point is that the ideas themselves were accepted and gradually implemented.

A few qualifications ought to be made about the foregoing. First, there is no suggestion that rulers did not contest these developments – evidently they did as the following case study, not to mention the French and American Revolutions, demonstrates. In addition, there is no suggestion that these developments in constitutional thought and practice were inevitable, or unfolded in a linear fashion. Merely focussing on these important developments, however, does not make one guilty of what Butterfield (1931) famously decried as the Whig interpretation of history. Third, like all generalised arguments, this one is liable to the accusation that it obscures more than it reveals. It might be said that it focuses upon a Western historical story, one which emphasises developments in legal constraints imposed on a ruler rather than, say, the moral constraints Confucianism is thought to impose upon some Asian political leaders. Alternatively, it may be thought to present a distinctly English story, one at odds with the mostly absolutist experience of government on the Continent (Reus-Smit 1999: 99-101). These criticisms have some force, but they underestimate the importance this distinct array of constitutional ideas has had on states. These are ideas which animate global political discourse; their enactment or otherwise in practice is consistently the subject of widespread controversy (Lane 1996: 19). While many date the emergence of states to the period of continental absolutist states, the extent to which the governing principles of that period bear a closer resemblance to the modern state than the principles underlying constitutionalism is open to doubt. In this light, pointing to the significance of constitutionalism as a generative force for the emergence of states, albeit at different times, is no more radical than focussing on absolutism.

English Constitutionalism in the Seventeenth Century

The following case study is arranged thematically, rather than narratively or chronologically, around the three subjects of constitutional thought and practice identified above. The timeframe extends from the beginning of the seventeenth century into the first quarter of the eighteenth century, following a standard periodisation of English history in accordance with the era of the Stuart monarchy (e.g. Hill 1980; Lyon 2003: 197).

Source of Power

The period beginning with the reign of James I (1603-1625) and ending with the Glorious Revolution (1688) saw a
fierce debate over the source of authority of monarchical rule. James I and his son, Charles I (1629-1645), were strong defenders of the divine right of kings; an idea prevalent throughout Europe (Holsti 2004: 38) and firmly established in England by the sixteenth century (Holdsworth 1956: 465-66). It held, in simple terms, that monarchs were anointed by God and unable to be called into question by any earthly, including papal, authority (Morgan 1988: 18). The strong support of this doctrine by the Stuart monarchs was accompanied by an assertive governing style. It involved the levying of highly unpopular extra-parliamentary taxation such as forced loans and ship money (Keir 1969: 191-2), the insistence on absolute royal authority in many matters, including foreign affairs and the right to wage war, and the eventual dissolution of Parliament (Hill 1980: 48)

The monarchs' approach engendered a backlash by parliamentarians. Among other things, they passed resolutions immediately prior to the trial of Charles I following the Civil Wars (1642-1649), declaring that the people were the source of political power, which the Parliament, as a representative institution, exercised on their behalf. The laws they passed thus bound the King and the House of Lords, notwithstanding their lack of consent (Weston 1965: 58). Thus, even though parliamentarians were all property-owners and the franchise was thoroughly restricted (Hill 1980: 36), this did not prevent them from making claims on behalf of ‘the people’. These developments culminated with the passing of the Bill of Rights in the wake of the Glorious Revolution, which affirmed parliamentary sovereignty on the basis that it ‘freely represent[ed] all the estates of the people of this realm’ (Wicks 2006: 21). The ‘social contract’ works of Thomas Hobbes and John Locke in this period also reflected variants of popular sovereignty, the latter’s thought in particular going on to strongly influence the development of constitutionalism in the United States and, by extension, many other states (Gordon 1988: 284-294).

**Legal Constraints on Power**

If the people, through their elected representatives, were sovereign, then it followed that state power was subject to constraints. This logic was made manifest in the principle of the separation of powers. Parliament vigorously sought to assert its independence. The most significant early example of this was when the Petition of Right (1628), outlawing extra-parliamentary taxation, was passed by Parliament and assented to by Charles I (Downing 1988: 25; Morgan 1988: 24). After a turbulent period comprising the Civil Wars, the rise and fall of the Cromwellian Protectorate (1653-1659) and the resurgence of Stuart monarchy thereafter, this principle was cemented by the Bill of Rights – effectively acknowledged by the new monarchs, Mary and William, as a condition of their rule. Parliamentary grants of taxation power were effective for only a single year; and financial strain of war with France from 1690 ensured Parliament’s importance (Lovell 1962: 397).

Another related source of legal constraint was what was post hoc described as the ‘ancient constitution’, the leading advocates of which were lawyers, parliamentarians and judges of the period such as Sir John Fortescue, Edward Coke and John Selden (Christianson 1993: 90-1; Hulsebosch 2003: 439, 445; Reid 2005: 5-6). This was essentially the notion that the common law of England, based on custom and enforced by a central authority in the form of the courts, constituted a fundamental law which had existed since time immemorial and to which rulers were subject (Hulsebosch 2003: 446; Pocock 1985: 94). In this way, the status of the judiciary as interpreter of the law began to be elevated to an equal level of prestige as Parliament and the Crown (Gordon 1999: 257). After all, the ‘law itself was sovereign’ (Hill 1980: 55) and the judges declared what it meant. Though the doctrine of parliamentary supremacy circumscribed its effect in England, the notion of the ancient constitution can thus be seen as a theoretical precursor – one in which the Parliament, not judges, primarily upheld the constitution – of judicial review underlying much modern constitutionalism in the American tradition.

**Proper Use of Power**

Naturally, the principles underlying the ancient constitution were all important. The whole edifice of government was seen as existing to ensure their furtherance and protection. Those principles comprised related notions of property and liberty (Wicks 2006: 22), into which domains the Crown prerogative did not extend; Coke’s phrase that ‘a man’s house is his castle’ summed up the attitude (Hostettler 1997: 128), as did a question asked by an MP in 1693: [w]hat signify all our laws if we have no estates?’ (Hill 1980: 247). Indeed, the Bill of Rights marked
a profound change in which the rights and liberties of (at first, only the wealthy and propertied) people became ‘a condition of the monarch’s right to rule, the yardstick of a government’s right to exist’ (Nenner 1992: 88). The purpose of government was no longer to secure the private good of the monarch but the common good of the public. A simple reflection of this was the modernisation of the courts, where technical French and Latin gave way to the mandatory use of English, the common tongue (Hill 1980: 152). Moreover, the ‘parasitical state’ addled with corruption that was ruled over by James I and Charles I and later emulated to some extent by Charles II in the Restoration period was a thing of the past after 1688: the explosion in political journalism, the regular sittings of Parliament and the committee investigations it held saw to that (Ertman 1997: 185, 209-11). Indeed, the legitimacy that government attained from more open and accountable government ensured that its commitments were credible, thus increasing its ability to attract finance for its activities (North and Weingast 1989: 815-832). In this manner, constitutionalism might have restricted the areas in which public power could be exercised, but it did not necessarily diminish that power in other areas; nor, in fact, was it designed to (Wicks 2006: 17).

In sum, this was the first modern period in which the ideas of constitutionalism were clearly articulated and implemented to a degree. These ideas eventually ensured that the legitimacy of the state was to be built on more durable foundations.

**State Recognition As an External Process of Legitimation**

However, the formation of the state, as mentioned at the outset, depended not only on an internal process of legitimation typified by constitutionalism, but also on an external process of legitimation typified by the recognition emergent states afforded one another. The theoretical foundations of that process are discussed below before being elucidated in a case study of the Peace of Westphalia.

**Legitimacy and Recognition**

A disparate recognition literature exists in international relations that can be ordered, according to Bartelson (2013: 109), into three different categories: political (relating to the emergence of the modern state system and international society), legal (relating to the positive criteria for statehood in international law) and moral (relating to the mitigation of conflict between different non-state groups). For present purposes, it is the political concept of recognition that is of utmost importance.

The modern starting point for an analysis of recognition is with Hegel. In simple terms, Hegel asserts that humans cannot be entirely who they want to be but only who they are recognised, and thus allowed to be, by others. As such, the strongest desire that individuals have is for recognition itself (Hegel [1807] 1977: 111; Ringmar 1995: 94). The law is the manifestation of such recognition, for as Ringmar puts it, ‘to abide by the law is…not primarily a matter of ‘being good’, but rather a matter of submitting oneself to a rule which makes it possible ‘to be’ in the first place’ (1995: 95). In this sense, law is conceived of as an external legitimating force that is fundamentally constitutive of a person’s identity and thus what they can and cannot do.

Hegel went on to apply this insight to the realm of states and international law. The reason he could do this was because of ‘sovereignty’: that is, if states are to be the sole legitimate rulers over their subjects, then they need to be recognised as validly possessing such a right by those entities with the power to take it away, namely, other states (Ringmar 1995: 96). Hegel thus provides what has been termed a constitutive, as opposed to a declaratory, account of recognition (Erman 2013: 131-139). Declaratory accounts (e.g. Crawford 2006) are primarily legalistic and aver that so long as an entity meets specified criteria, then it is liable to be recognised as a state. By contrast, constitutive accounts point to the idea that the very act of recognition itself inculcates the properties which, when found in an actor, make it identifiable as a state (Erman 2013: 131-139). Isolating which properties inhere in a state prior to recognition and which arise thereafter, though, is an extremely difficult task (Wendt 2004, cited in Bartelson 2013: 113).

It is in this regard that Erman (2013) has made a significant theoretical contribution. By arguing that declaratory and constitutive theories are in all likelihood jointly sufficient, she suggests that embarking on this sort of task is
fruitless (2013: 142). Instead, what is required is a balanced appreciation of the dual components of statehood: recognition by other states, and the existence of certain basal conditions which enable, but do not compel, that recognition (Erman 2013: 144). In essence, statehood is the result of a ‘particular practice of autonomous agency premised on certain capacities to take part in this practice’ (Erman 2013: 145). It is therefore unnecessary to isolate inherent properties of a state from socially constructed ones, as they are both inter-subjective: what conditions enable recognition will necessarily depend on their recognition as enablers by states (Erman 2013: 141).

As such, the focus of the present inquiry is on the particular ‘recognitive structures’ established by states (Brandom 1999: 168-9, cited in Erman 2013: 138). Historically, these structures have in large part been composed of the interactive practices of war and international law and diplomacy. To Hegel, these are in truth complementary practices: a state struggled for recognition through war and, once recognition was granted, participated in the mutual constitution, by means of reciprocal recognition, of an international community of states (Ringmar 1995: 97). In other words, war was a tool used to demonstrate that an entity possessed the capacities necessary for it to be recognised as an independent power. However, war itself did not occasion the conferral of legitimacy. The consummate acts of recognition occurred through diplomacy, especially at post-war peace conferences where, as Ruggie observes, the issue was not only ‘who had how much power, but who could be designated as a power’ (1993: 162). This is a point rarely emphasised in traditional accounts. Tilly, for instance, acknowledges that his explanation of why war makes the state ‘neglects the external relations that shaped every national state’ (1985: 184). Tilly’s narrow focus on the emergence of the state thus hinders him from identifying, let alone explaining, the historical fact of the emergence of states.

**Peace of Westphalia (1648)**

On this issue, the point of departure for the vast majority of IR scholars, but not all (e.g. Wight 1977: 152), has been the Peace of Westphalia (1648) marking the end of the Thirty Years’ War. For the discipline of IR, however, Westphalia has scarcely been synonymous with peace. The traditional conception of the Peace as the ‘majestic portal’ (Gross 1948, cited in Phillips 2010: 136) from which a sovereign state system emerged out of the multi-layered jurisdictional patchwork of medievalism has been discredited as a ‘myth’, substantiated neither by the historical record of state practice before and after 1648 (De Carvalho, Leira and Hobson 2011: 740), nor the words and content of the constituent treaties (Osiander 2001: 251, 261; Krasner 1993: 235, 244, 246; De Carvalho, Leira and Hobson 2011: 740). It seems clear that the traditional conception of Westphalia as a ‘total and complete historical break’ should therefore be avoided (Fabry 2010: 24).

Nevertheless, Westphalia can be seen as an important milestone in the self-conscious emergence of a society of states, and thus by extension – if one accepts the recognition theory outlined above – of the state itself. Two principal reasons for this are canvassed here. First, and most importantly, the very act of agreeing treaties intended to durably govern the relations between so many states after such a destructive war was itself significant. Consensus was the guiding principle (Steiger 1998: 445, cited in Clark 2005: 60; Bobbitt 2002: 504), and a consensus existed on the desirability of peace – admittedly one tempered by the individual desire of parties to increase their international position (Osiander 1994: 21). The fact that treaties were agreed represented a substantial step away from *ius gentium* (the law of nations) to *ius inter gentes* (treaty law)(Clark 2005: 53). At the time, *ius gentium* was understood as closely connected to natural law – the law based on moral and religious precepts standing above the positive law declared by rulers – by scholars such as Suarez, Gentili and Grotius (Brown 2002: 30; Piirimäe 2009: 67-9), and in turn the rulers, such as those in Sweden (Ringmar 1995: 98-101), who read them. While the preambles to both the Münster and Osnabrück treaties themselves made reference to the guidance of religious and natural law imperatives (Reus-Smit 1999: 114-5), they gradually became a kind of shorthand for those principles by means of their incorporation in later treaties, most importantly those at Utrecht (1713) and Paris (1763) (Keene 2002: 20). Therefore, Reus-Smit’s (1999: 115) rejection of Hinsley’s assertion that the Westphalian treaties ‘came to be looked upon as the public law of Europe’ (1967: 168) is misplaced: they may not have superseded natural law immediately, but the very fact that they came to be looked on, in the midst of what Osiander describes as a ‘developing programmatic consensus agenda’ (1994: 73), as sources of law in themselves ensured that this was their eventual effect.
The second and related reason for Westphalia’s significance is that it dramatically demonstrated the need for emerging European states to justify, coherently and convincingly, their claims to powers and territory to others. To other secular authorities, an emergent idea that brute force might not always be enough was detectable: the ‘right of conquest’, though admitted in theory, was shaken at the treaty by the stiff reactions against the French and Swedish demands to keep possession of territory to which they were thought to have no legal title aside from conquest (Osiander 1994: 49-51). In short, the perceptions of others, dressed up in the language of rights and law, mattered. This was also revealed in the way the princes conveyed their claims for greater autonomy from the Holy Roman Empire in terms of their ‘ancient liberties’ of freedom of religion (Holsti 2004: 122-3) – a justification intriguingly similar to the claims, discussed above, of an ‘ancient constitution’ guaranteeing personal liberties formulated in early seventeenth-century England.

The ‘autonomous agency’ (Erman 2013: 145) of states involved in recognising each other was thus on clear display. While this falls short of establishing any clear principle of sovereignty, it nevertheless illustrates that ‘[w]hat entitled any political unit to participation was the social act of its recognition by others.’ (Clark 2005: 64). In other words, though the precise requirements for recognition were to be delineated later, Westphalia confirmed two things: that recognition was necessary for states; and that it was to be granted by states, for states.

Conclusion

This essay began by noting the central, if under-acknowledged, importance of legitimacy to the emergence of state formation. In sketching an answer to the question of how states became the sole legitimate forms of polity, two general contentions were advanced: that internal legitimacy was arrived at through a process of constitutionalism, a prominent early example of which was seventeenth century England; and that external legitimacy arose through a process of reciprocal recognition which was becoming visible at Westphalia.

The plethora of books, monographs, articles, dissertations and assorted academic writings on state formation should be sufficient to make two things clear, however. The first is that this essay does not seek to make any all-encompassing conclusions, but rather to shed light from a different angle on the topic. The second is that state formation deserves to be scrutinised. It is to be hoped that the tools of IR scholars, of which legitimacy is one, are not spared in affording it such scrutiny. In other words, there is no reason to suspect that Otto von Bismarck’s aphorism that ‘laws are like sausages; it is better not to see them being made’ applies to states.

Bibliography


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Holsti, K.J. 2004. Taming the Sovereigns: Institutional Change in International Politics. Cambridge: Cambridge
The Legitimation of the State: Constitutionalism and Recognition
Written by Finian Cullity

University Press.


The Legitimation of the State: Constitutionalism and Recognition
Written by Finian Cullity

Northern Illinois University Press.


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