Gordon Tullock Meets Phineas Gage: The Political Economy of Lobotomies in the United States

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ABSTRACT
In the 1940s, the United States experienced a "lobotomy boom" where the number of such procedures increased rapidly in spite of a wide scientific agreement that it was inefficient. In this paper, we seek to explain this popularity using the framework developed by Tullock (1966) regarding how incentive structures can be altered by institutional structures. Highlighting that the practice had virtually disappeared from private hospitals and were performed only in public hospitals, we argue that government influence in the medical field prolonged the use of an ineffective and harmful medical procedure despite scientific consensus against the use of lobotomy. Extending Tullocks analysis to examine the use of the lobotomy provides important implications for governments role in promoting science.

KEYWORDS
Lobotomies, economics of science, public choice, political economy, mental health

1. Introduction

In 1952, smoking rates plummeted after *Reader's Digest* published an article linking smoking to cancer rates. Although concerns had existed in the scientific literature since the 1930s, a consensus had begun to crystallize in the 1950s. The article, followed by the report of the Surgeon General in early 1964, reduced the popularity of cigarettes. Greater news coverage of the scientific literature gradually reduced the incidence of smoking (Pierce and Gilpin 2001). In this case, scientific criticism altered behavior. There is, however, another case where a scientific consensus crystallized rapidly but failed to dent the popularity of the practice. This is the case of the "lobotomy boom" (Holden 1973, p. 1109).

Few procedures in medical history are as reviled as the lobotomy. Often described as part of the dark history of psychosurgery and mental-health provision in US, the lobotomy has been criticized as one of the most spectacular failures in the history of medicine (Johnson 2009, p. 367) and more lunatic than the patients they were meant to help (Havens 1973, XXXX). Even with the last lobotomy in the US performed 50 years ago, it serves and an enduring example of the widespread use ineffective and harmful medicine (Holden 1973). In the 1930s and 1940s, several medical associations denounced the practice of lobotomy to treat mental patients. By the early 1940s, a

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consensus had formed that the practice was not helping patients (Holden 1973). Yet, the number of procedures soared after numerous medical journals and professional associations denounced it and the practice continued as late as 1967. Why would a practice generally denounced persist and gain in popularity unlike the case of cigarettes whose popularity fell?

Explanations for this continued popularity after a scientific consensus had formed are elusive. In the present paper, we propose an explanation related to the incentives generated by the institutional structure of mental health services provision. Noting that a disproportionate share of lobotomies were performed in public hospitals and that the practice had disappeared in private hospitals much earlier than in public ones, we argue that the incentive structure of the public hospitals should be a key ingredient of any proposed explanation.

To analyze this institutional framework, we largely use a similar one created by Tullock (2005) in his *The Organization of Inquiry* and its intellectual cousin found in the work of Kealey (1996).[1] Tullock's extension of economic reasoning to the process of scientific research and applications allows us to map out the incentive structures facing doctors.

In public hospitals, funding was on a *per capita* basis but at a very low level which constrained revenues. However, lobotomized patients tend to be more docile and, as such, cheaper to manage. Moreover, those who operated within those hospitals were largely separated from the rest of the profession. Combined, these two mechanisms made it easier to continue performing lobotomies as it was **a)** profitable from a bureaucratic perspective and **b)** there were few costs to professional practitioners. In contrast, physicians operating in private institutions were more connected to the wider profession which could ostracize those who persisted with the practice in spite of medical consensus. Moreover, private foundations funded the activities of the private hospitals, funding which they could retract if the practice was too controversial. Finally, private hospitals did collect revenues from the families of patients who could hold them, to some extent, accountable. The two systems operated under dramatically different incentive structures. As a result, they generated dramatically different outcomes.

This paper proceeds as follows. In section 2, we explain the practice of lobotomy and highlight the puzzle of why it persisted for so long. In section 3, we develop Tullock's (2005) framework in relation to the use of the lobotomy. Section 4 applies the framework through the institutional comparisons of the two systems. Section 5 concludes and provides implications for future research.

2. Literature Review

The term lobotomy does not refer to a single procedure but rather a set of psychosurgical procedures involving the removal or destruction of brain tissues. Initially, the first lobotomies performed on human beings consisted of injecting alcohol in the prefrontal cortex to destroy tissues (Pool 1954; Gross and Schäfer 2011). However, soon after a surgical procedure known as leucotomy allowed for the physical removal of portions of the brain. This practice, developed by Egas Moniz during the 1930s, was imported into the United States by Walter Freeman and James Watts who conducted a disproportionate share of the 50,000 lobotomies conducted in the country.

[1] One can also consider the work of Taubes (2007) who is in this broad line of considering the role that the incentives of policy-makers and industry members played in divorcing scientific research from scientific applications.

Ten years after Moniz conducted his first surgical procedure, Freeman boasted that he had already conducted 400 lobotomies (Freeman and Watts 1946, 293). By 1957, Freeman pointed to having realized some 3,000 lobotomies (600 pre-frontal and 2,400 transorbital) (Freeman 1957).

Rapidly, during the late 1940s and early 1950s, the procedure grew increasingly popular in the United States. However, there was a strong reaction against lobotomies from the beginning. In 1941, the American Medical Association published an editorial naming five important critics of the procedure in order to sustain the claim that no one could assert whether or not this was a worthwhile procedure (Anonymous 1941). Gradually, physicians became increasingly skeptical and by the early 1950s, the criticisms had crystallized and were beginning to seep within the popular presses (Robinson 1946; Goldstein 1950; Kucharski 1984; Diefenbach et al. 1999; El-Hai 2005). In addition to debates over the efficacy of the practice, there were serious ethical issues raised about it (El-Hai 2005). Yet, according to the available data, the practice soared in spite of those criticisms and continued well after they had crystallized (Pressman 2002).

Two hypotheses exist to explain the persistence. The first is that there was a lack of medical scrutiny which led to a premature endorsement of the practice. The second is that there was a lack of alternatives. This latter explanation is best illustrated by Worthing et al. (1949, 647) who questioned the efficacy of the procedure using some 350 case reports but still concluded that "in spite of its limitations, the operation seems to be therapeutically active and fills a real need *while we await a better treatment*" (emphasis ours). There are problems with both explanations in the sense that they are incomplete.

First, it must be explained why a small number of American physicians (like Walter Freeman and James Watts) performed the lion's share of lobotomies (Freeman 1957). These individuals were frequently criticized, as exemplified by the early warnings of the American Medical Association, and other medical professionals imposed reputational costs with psycho-surgery by creating the moniker of "lobotomist" to mock practitioners (El-Hai 2005). That a small number of eager physicians were able to perform a large number of procedures in spite of professional costs should warn us to the possibility of an institutional explanation that goes beyond the medical profession.

Second, if there was a lack of alternatives, one must explain why private hospitals were more reluctant to try out lobotomies than public hospitals. Indeed, the practice did not take the same magnitude (all proportions held) in private hospitals than in public hospitals and it died out faster in the former than in the latter. For the year 1949 - towards the end of the lobotomy boom - Pressman (2002, 173) reports that 6% of lobotomies were conducted in private hospitals. For that same year, the report on "Patients in Mental Institutions" produced the National Institute of Mental Health (NIMH) (1952) produced data on 225 private hospitals for "mental diseases" and 125 private hospitals for "mental defectives and epileptics". Adjusting for the difference in response rates, private hospitals represented 3.6% of the "resident patient" population[2] of all mental institutions.[3] However, these figures are misleading to the true impor-

[2]These are defined as the patients on the books at a certain point in time

[3]There is a necessary adjustment to be made. For institutions specialized in working with "mental diseases", 199 state hospitals, 49 county hospitals, 1 city hospital, and 225 private hospitals replied to the schedules sent by the institute. With the exception of private hospitals, the response rates were equal to nearly 100% (1952: 2-4). Private hospitals were less responsive as the surveys were sent to 272 of them to which only 225 replied. The same was true for "mental defectives and epileptics" where only 125 out 145 private hospitals responded. To adjust the figures, the hospitals that did not reply were assumed to be of equal size as the responding hospitals.

tance of the private hospital population. According to the same NIMH report, the private sectors represented 23.5% of the 248,047 admissions to "prolonged care" institutions (1952, 14) and 11.3% of the 12,336 "first admissions" to institutions for mental defectives and epileptics (1952, 18). As such, the 6% figure of lobotomies performed in private institutions proposed by Pressman appears to be below the proportions of the total volume of care handled by private hospitals. Moreover, after 1950, the share of procedures performed in private institutions falls. Why is there this institutional difference?

Had the practice been popular across the whole profession regardless of the type of institution, the two generally advanced hypotheses could have been accepted without qualification and as an illustration of a profession erring for some years before correcting itself at the sight of accumulated evidence. However,the differences that we highlight suggest that within the profession there existed different incentives which affected the propensity to accept or reject lobotomies as a valid procedure.

3. Incentives and Scientific Inquiry

In the production of knowledge, incentives matter. Adam Smith once remarked that professors in Scotland and Oxford were no less competent than each other but those in Scotland were producing higher quality courses and some "the best seminaries of learning that are to be found anywhere in Europe" (Rae 1895, 273). The argument that Smith highlighted is that Scottish professors were remunerated based on subscriptions to their classes while Oxford professors received generous salaries funded by endowments. In full, the outcome difference between the two systems was based on the shaping of incentives produced by the educational institution. That insight from Smith was elaborated in greater details and geared towards the actual production and adoption of knowledge by Gordon Tullock (2005).

The framework he constructs divides the scientific into two components: applied and pure. The applied scientists primary research objective is to utilize science discovery for personal gain. Personal gain for the applied scientist occurs through influencing peers or and through induced curiosity (2005, 24) or (financial) rewards for pursing research of interest to those outside the scientific community. The "applied" scientist is also the person who tries to assess the value to society of any given discovery. As such, he has features akin to that of an entreprneur. The pure scientists research is more directed toward expanding the theoretical body of scientific knowledge (2005, 10). Although the sought ends of their research efforts differ, their research efforts play a complimentary role in advancing the scientific body of knowledge. Simultaneously, the two components supervise each other while also stimulating each other. As Tullock describes it:

> The scientists curiosity is subject to social guidance. The information inputs from other scientists are important in shaping the problems which he will investigate. Similarly, he is normally interested in the approval of his peers and hence will usually consciously shape his research into a project which will pique other scientists curiously as well as his own (Tullock 2005, 25)

In essence, he likens the process of the production of knowledge (just like Smith did) to the structure of the market in which he operates. Tullock is not the only one to notice these similarities: Polanyi (1962); Kealey (1996); Butos and Boettke (2002); March et al. (2016) also draw similar analogies between market processes and the incentives

embedded within them and scientific research.Utilizing dispersed information captured through the price system, the market process coordinates the actions of countless individuals pursuing their own objectives to put scarce resources into their highest valued use (Hayek 1945). Through the profit and loss system, those allocating resources are provided feedback whether they are allocating resources desirably.

However, as Tullock points out, the scientific community cannot use the price system to guide its efforts. As such, it must rely on different mechanisms in order to filter productive from unproductive uses of research resources. The key mechanism he specifically emphasizes is the ability of the scientific community to assess the verification (accuracy) of new discoveries. The verification process is largely performed by scientists who are considered experts in their fields of study. These experts earn their reputation from their peers and perform their verification role by serving in leadership positions for academic journals, research organizations, and through other professional capacities.

The validity of new discoveries requires acceptance from experts but they also must withstand the scrutiny of other "applied" and "pure" scientists who also perform a verification function. The "pure" scientist examines a new discovery on its theoretical soundness while the applied scientist tests soundness through testing a discoverys replicability (2005, 46) . If the new discovery withstands the scrutiny, it may become accepted as a general truth (2005, 50) which serves to coordinate further research efforts through a dissemination process (2005, 108). This process serves to determine which discoveries are correct as well as where and how discoveries are applicable to current research efforts.

However, like any process, it can be distorted and rendered less efficient thus sustaining negative developments such as lobotomies. The distortions to scientists' ability to verify and disseminate are a function of their institutional constraints. These constraints can either promote scientific avenues of research before they are validated by scientific peers (Taubes 2007) or hinder scientific discovery through diluting incentives (Kealey 1996) while changing the manner in which research is conducted. What will determine what outcomes they generate is determined by the extent of the divorce created between one scientist and his peers.

Although an institution working to distort efforts in the scientific community has not been applied to the use of lobotomies, this framework has been applied to other areas of scientific inquiry. Taubes (2007) finds financial incentives tied to researching dietary advice advanced by the USDA likely prolonged incorrect nutritional hypotheses associating fat consumption with heart disease. Kealey (1996) notes universities and scientists can serve in a powerful lobbying capacity, working to distort resources away from scientific inquiry and into securing state favors and funding. As a consequence, diversity in research diminishes, in his own words, only a plurality of funding will yield a plurality of thought (1996, 185).

This is not to say poorly designed institutions will allow comparatively less effective science to perpetuate indefinitely. Ultimately, scientific errors will be found and resources redirected (Tullock 2005). However, when new theories are distanced from the scientific community by external means it is likely the verification process is delayed, working to prolong the dissemination of erroneous discoveries. As a consequence, false scientific discoveries may permeate the work of other scientists and become an accepted part of the scientific body of knowledge. When these factors are present and work to realign the incentives of scientist to seek approval from bodies adopting less rigorous verification methods, the likelihood of incorrect scientific findings sustaining influence and adoption of the contribution by other scientists increases.

Lobotomies can be analyzed with these lenses given the facts highlighted above. There appeared to have been differences in the popularity of lobotomies across different institutional lines (private institutions versus public institutions) which highlights that each set of institution generated incentives that generated different outcomes regarding the use and preferences for lobotomies as a psychiatric procedure.

4. The Institutional Setting of Asylums

Before proceeding with how incentives differed with regards to the practice of psycho-surgery in private and public hospitals, it is necessary to understand the overall environment in which psycho-surgery emerged.

In the realm of treating mental diseases, the progressive era in American history was marked increased funding on the part of governments and a shift from private asylums to public ones (Rothman 1971). As a whole, the psychiatric profession was keen and lobbied for this increase of the role of government in "mental hygiene" (Rothman 2002).

In the early 1900s, the broad field of psychiatry began a movement to unifying the variety of opinions and medical approaches toward the goal of advancing itself as a unified medical field providing medical benefits to the general public. A leading figure of this movement was Adolf Meyer, who worked to legitimize the study of the insane by urging a unified theory to examine insanity merging psychiatry and medical biology (Pressman 2002). Meyer sought to redefine the role of providing mental health care as caring for patients while simultaneously providing public health efforts to prevent insanity (Rothman 1971; 2002; Pressman 2002). Meyer's vision was largely carried out and financed through the legislature. Through professional contacts within government, Meyer and his political supporters were able to secure financial support to establish a large network of state hospitals (with psychiatric wards) and increased funding for state asylums. Whereas the majority of federal funds for scientific research since the Civil War were for agricultural purposes (Kealey 1996, 148), the 1930s witnessed the advancement of a larger, federally directed, effort to provide larger scale public health (Burnham 2015). With the new commitment to caring for the insane many states passed legislation to reduce the complexity of their commitment laws (Rothman 2002). The laws worked to make committing patients temporarily to psychiatric clinic easier, resulting in overpopulation. Many of these cases, to reduce the burden on the clinic, were sent to state hospitals.

This latter shift induced a rapid demand for the services of mental institutions. During the period from 1920 to 1940, the population of mental institutions for causes of "mental retardation" more than doubled (from 50,000 to 113,000) (Nelson and Crocker 1978, 1039) while the American population increased by less than 30%. When including other patients, those numbers jump to 481,000 in 1940 (NIMH 1952, 14). By 1949, that number had jumped to 564,000 (NIMH 1952: 14). Overall, from 1900 to 1950, the inpatient population had increased nearly four-fold (Bassuk and Gerson 1978). Hospitals were ill equipped to handle the rapid influx of patients. In some cases, hospital directors and physician staff had not experience treating mental illnesses (Rothman 2002). This led, most notably, to important overcrowding: from 7.1% above capacity in 1926 to 9.4% in 1938 (National Institute of Mental Health 1941, 75), to 12.5% in 1945 (National Institute of Mental Health 1948, 26) and 18.1% in 1949 (National Institute of Mental Health 1952, 68). Simultaneously, expenditures grew rapidly. Between 1946 and 1960, average expenditures per patient (adjusted for inflation) increased 153.5%.

Between 1946 and 1950 alone - during the lobotomy boom - expenditures per patient increased 43.4% (Grob 2014, 164).

4.1. *Public Hospitals*

The increased demand for services, overcrowding and a lack of consistent treatment for mental illness served to direct the incentives of scientists to change their approach to treatment and care. The main impetus for this was related to the cost of treating patients and the revenues that hospitals had at their disposal. Funding formulas, generally fixed at the state-level on a per diem basis, had not been sufficient to cover expenses in the post-war era (Grob 2014, 78, 172). Psychiatrists recurrently complained about this lack of resources, especially since they had to allocate close to 60% of resources to staff (Valenstein 1986). Moreover, the staff to patient ratio increased from 0.16:1 (National Institute of Mental Health 1941, 5, 77) in 1938 to 0.21:1 (National Institute of Mental Health 1952, 14, 66). Faced with these rising costs, public hospitals began to consider methods to reduce costs while also providing care. This included the use of lobotomy which had the benefit of creating patients that were more docile and calmer. They could also, according to Freeman who was the lead advocate for lobotomies (Freeman 1957), be returned easily to the community. This meant that they were cheaper to deal with. In 1941, the superintendent of Delaware State Hospital, Mesrop Tarumianz, noted this benefit during a panel discussion during the American Medical Association meeting:

> From an Economic point of view I should like to give some figures as to what this may mean to the public. We have to the following conclusions with regard to our own cases: In our hospital there are 1.250 cases and of these about 18- could be operated on for $250 per case. That will constitute a sum of $45,000 for 180 patients. Of these we will consider that 10 percent, or 18, will die, and a minimum of 50 percent of the remaining, or 81 patients will become well enough to go home or be discharged. The remaining 81 will be much better and more easily cared for the in hospital. Thus the hospital will be relieved of the care of 99 patients. That will mean a savings $351,000 in a period of ten years (Pressman 2002, 162)

In the late 1940s, an article in the *Stanford Law Review* (1949) warned against this development in the profession noting that there was an inherent conflict of interest. The use of the operation by public institutions is strengthened by the fact that a lobotomy may be employed for reasons other than the ultimate welfare of the patient" it argued. The operation could be a satisfactory means of controlling obstreperous inmates even when unsuccessful in rehabilitating the patient. Human vegetables present few disciplinary problems. The over-crowded facilities and lack of funds characteristic of many state institutions supply a strong incentive for such action. (1949; p. 471). Additionally, according to the same source, public institutions in some states held the right to perform lobotomies without obtaining the patients consent which further empowered the use of such a solution to control expenses. Professionals working within the state hospital system were conflicted between, their roles as medical professionals and as hospital administrators (Pressman 2002, 209).

The physicians in state institutions, acting as applied scientists, were likely incentivized to treat more difficult patients with minimum costs techniques in accordance with the desires of their employers. Furthermore, with the interests of the applied scientists and the public bodies managing the institutions housing mentally disturbed patients would be less receptive to the criticisms and concerns of the larger scien-

tific community. The applied scientists implementing potentially erroneous methods of treatment are primarily incentivized to use methods accepted by their source of funding or income which may clout the way their craft or science is conducted (Tullock 2005, 29). Publicly owned asylums whose patients are involuntarily checked in are similarly less receptive to scientific scrutiny of their treatment methods because of the separation of the profit motive. Rather, they are likely more incentivized to provide minimal effort to perform duties and only respond to requirements from authoritative figures.

In addition to the incentives being geared towards the use of this approach, there were also smaller costs to the practitioners in terms of reputation. Consider the case of Walter Freeman who was the leading advocate for lobotomies. Early on, he was heavily criticized within the profession. His main book, *Psychosurgery*, was rejected by two academic publishers before being published by a minor editing house. When it was published, few medical journals accepted to review the book (El-Hai 2005). In 1949, *Psychiatric Quarterly* depicted the use of psychosurgery as little more than a shot in the dark (Pressman 2002, 319). Freemans original presentation at the Southern Medical Association was met with criticism that was often heated, even vicious. He was on some occasions, shout[ed] down. Prominent neurosurgeon Loyal Davis harshly remarked, the offhand manner in which this surgical procedure is described and discussed is no credit to the essayist as a surgeon, a pathologist, or one who is searching for scientific truth (Pressman 2002, 81).

As noted above, Freeman conducted close to 10% of all lobotomies in the United States. More importantly, given the numbers he reports in his 1957 article, he conducted the near-majority of lobotomies in the United States once the boom had ended. Yet, as he himself noted, he struggled in private practice and found it easier to be accepted in public institutions (El-Hai 2005). As he was providing justification for the use of lobotomies in public institutions, his continued influence can be well explained especially since "the kinds of evaluations made as to whether psychosurgery worked would be very different in the institutional context than it was in the private practice context (Pressman 2000, 145). As such, if we apply Tullock's framework, we can qualify Freeman as the applied scientist disconnected from the pure scientist largely because the incentives around him have lessened the reputational costs associated with persisting with his practices.

Both during and after the boom, there was a disconnect between pure and applied scientists which is well-exemplified by Freeman. As an applied scientist, Freeman (who also invested large media efforts to promote lobotomies - (Valenstein 1986; El-Hai 2005)) was opposed by pure scientists who were skeptical at first (advocating limited use) and openly hostile as the boom took place. Yet, because he was serving the purpose of controlling bureaucratic expenditures, Freeman was shielded in part from the costs of continuing with lobotomies. The superintendents of hospitals and other hospital administrators still spoke highly of him and hired him to perform lobotomies. Although the pure scientists whose interests overlapped neurology and mental health were highly critical of lobotomy procedure on its theoretical grounds, the longevity and popularity of its use can despite criticism from the medical field can be explained through institutional changes in the market for caring for the mentally disturbed. Where the incentives of those applying the lobotomy techniques change and are less bound by the critical feedback of the scientific community.

4.2. *Private Hospitals*

Physicians in private settings had strong incentives to learn and utilize the latest treatment methods that demonstrated success. As physicians financially benefited by deciphering which methods were likely to help their patients, engaging with the broader medical community was advantageous. Similarly, physicians risked financial losses and reputational damage for using ineffective treatment methods. This served to exercise caution when selecting a treatment method they deemed unproven or potentially harmful.

Several medical historians note physicians in private practices were often hesitant to accept, and even critical of, new mental illness treatment methods. Valenstien (2010) provides the example of focal infection theory which was developed by Henry Cotton, a medical director for a state hospital with a psychiatric ward. The theory held mental illness stemmed from infected body parts including teeth, tonsils, pituitary glands, and several sexual organs. Cottons theory faced severe criticism from numerous physicians who challenged the theory on its biological soundness as well as the results he reported. As a consequence, the theory was quickly discredited.

Although physicians either directing or working for private mental asylums faced slightly different incentives than those in private practice, they too faced steep financial and professional costs by taking excessive risks when treating their patients. Reputational damage to the asylum could result in donors withdrawing their financial support, decreases in voluntary enrollment (typically a large percent of patients), or caregivers removing committed patients. Second, many of those physicians were disciplined by the fact that they participated in the gatherings of medical societities where the research was discussed.

Pressman (2002) provides evidence for this incentive structure when he examines the use of the lobotomy at McLane Hospital, a private mental hospital in Massachusetts. He finds the medical staff engaged in a rigorous selection method and decision-making process whenever the procedure was considered. Physicians organized committees to discuss if the patients condition warranted undergoing surgery and if all other treatment methods were truly exhausted. The committee also sought approval from the patients family and the patient if possible. If the committee agreed , and it often did not, that the lobotomy was worth the risk, the procedure took place in a separate hospital with a handpicked surgeon. Extensive procedures like these were rarely observed in public asylums where treatment discretion was at the hands of the superintendent (Pressman 2002).

This is not to say physicians in the private sector never made errors. Erroneous treatment methods were used by physicians in all settings (Pressman 2002). However, incentives faced by physicians in private settings were comparatively better aligned to exercise caution than in public asylums.

There was a disconnect between perception of lobotomies in the popular press and the academic community (i.e. the pure scientist) until the early 1950s (Diefenbach et al. 1999). This disconnect was largely the result of Freeman cultivating relationships with writers in prominent newspapers. It is only after the disconnect faltered that the lobotomy boom ended. In no small part, this closing of the gap resulted from efforts on the part of pure scientists. As press coverage turned negative in the 1950s (Diefenbach et al. 1999), scientists engaging in lobotomies were incurring additional costs in the form of a negative public perception.

5. Conclusion

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