

Day Work, Task Work and Watch Work: Labourers at St Paul's Cathedral 1672-1748

Judy Z. Stephenson¹, Meredith Paker², Patrick Wallis³

1: The Bartlett School of Sustainable Construction, University College London

2: Oxford University

3: London School of Economics and Political Science

Introduction

Construction and architectural historians have thoroughly researched many aspects of the design and draughtsmanship, management, organisation, and construction of Wren's St Paul's, particularly in relation to some of the better-known craftsmen and draughtsmen. There is still emerging research, and plenty remains to be done on those and on the matters of contracting, finance, and supply chains. However, as Campbell notes, very little is known about those who worked on the ground on site, particularly the 'unskilled' labourers the Commissioners relied on throughout the 35-year main construction period [1].

Construction history does not often focus on labour and labourers. Economic and social historians have long been interested in building craftsmen and labourers, however, viewing them as epitomising the premodern skilled and unskilled workforce, especially in urban environments. Since the mid nineteenth century they have utilised labourers' day wages as indicators of the average unskilled wage and interpolated various series extracted from building records to construct long run average real wage series and welfare ratios [2]. It is rare for information other than wage rates to permeate the narratives of living standards, industrialisation and development which these wages usually accompany [3].

Mostly, economic and social historians accept, explicitly or otherwise, three facts about labourers that are slightly contradictory: firstly, that labourers assisted skilled craftsmen; secondly that labouring was *casual* work and that hiring happened in some sort of spot market; and thirdly that the unskilled workforce was just that – a workforce, homogenous for purposes of analysis, and, indeed any further enquiry into the experience of work or the attributes of workers is usually prohibited by the limitation of sources which rarely list men's names or even full details of work done.

The exception amongst studies is Donald Woodward's 'Men at Work', a study of craftsmen and labourers in the Northern Towns of England 1450-1750 [4]. Woodward highlighted that labourers were in a market for general labouring and haulage, and portering (in other words transport and distribution, and public services) not just building trades. At most of the sites he studied, which tended to be long run institutions, or vital investment in infrastructure or local mega-projects (such as Church and bridge building) he also showed there was a distinction between small number of retained regular employees who had regular work in any place, up to c. 200 days a year or more, alongside casual labourers who were hired on a project basis and had less than 149 days a year work on average. By contrast, there is very little dedicated research on labourers in London through the early modern period. Beier and Findlay asserted that labourers made up over 5% of the London workforce (although they did not clarify whether in building or haulage) [5], and Boulton found wage rates 1700 - 1721 of 24d. per day [6]. Schwarz reiterated transport workers as predominant in groups of labourers for the later eighteenth century [7].

A recent research project into work and wages in London in the seventeenth and eighteenth centuries between Dr Judy Stephenson (UCL) and Prof. Patrick Wallis (LSE), and Dr Meredith Paker (Oxford) has (with the help of Dr Kate Osborne) digitised the employment records of all labourers on site at St Paul's 1672 – 1748 for the first time. The result – a database of just over 22,000 observations of over 1,000 men, offers economic, social and construction historians the opportunity for a rare insight into the identity, work, income and organisation of one of the most cited but least researched groups in economic, social, or construction history. By coincidence there have recently begun similar studies of labouring groups at St Peters in Rome, [8] and the Grand Palace Madrid [9] in similar periods to compare to. This keynote lecture attempts to bring construction historians up to date with what we have found so far.

The big questions about the characteristics of the workforce at Pauls are the big questions about early modern labour generally. How skilled were they? How much were they paid? Were they coerced or free? What did they contribute? How did they live? In many ways what we have discovered through acquiring such a big dataset (as historians of early modern London will expect) is frustratingly little. But overall, there are three insights. Firstly, that labourers were far from a homogenous group – their employment, income and the fragments we can see of their experience at the Cathedral – all suggest a heterogenous group of age, ability and various brawn, petty entrepreneurship, semi-skilled trades, and human and social capital. By implication it's far from obvious that we should be treating them as unskilled. Secondly, their working lives and income were precarious and variable. The most obvious observation is how fleeting most employment relations at the cathedral were. Thirdly, there is enough in the analysis of working practice so far to suggest that the late seventeenth and early eighteenth century may have been a period of profound change in the contracting and organisation of labouring work.

The paper is organised as follows. In section two we describe the project to digitise and database the records and the original hypothesis. In section three we describe the labourers human capital or skill and their work. In section four we discuss how this translated into income, and in section five we use matches with other records from the period to contextualise the lives and identities of the men. In section six we summarise and consider the implications for what we know about construction labour organisation in the long run before concluding and highlighting what remains to be done.

II

The source and resulting data set

As Woodward described, the term 'labourers' is used to represent several groups in the building trades: semi-skilled men assisting craftsmen; more general hard labourers, and handymen; regularly employed unskilled hauliers and labourers and maintenance officials: casually hired men; hauliers and porters [10]. In long run organisations in England with large buildings or fixed assets (usually those of the church, boroughs, corporations and colleges) there are often descriptions of their all of their activities in annual abstracts and accounts.

The rebuilding of St Paul's Cathedral after the Great Fire of London, funded by a coal tax levied by Parliament, and administrated by a Commission of both Crown and Corporation representatives necessitated and produced a set of accounts and abstracts of exceptional detail and persistence. In each accounting period day work for craftsmen and contractors directly supervised by the clerk-of- the works was detailed, with the names, and the number of days worked by every labourer. Task and measured work with contractors were separately detailed, salaries, allowances and provisions, were recorded, and, during the late 1680s and 1690s creditors and the cost of their loans and finance were also added to the accounts.

The records of the construction of the Cathedral are exceptionally well kept. Housed for many years in the Guildhall they were moved to the London Metropolitan Archives by 2015 [11]. The series runs from book 10 starting in October 1672 and contains 33 volumes of material. There is a gap from June 1710 to June 1714 (between volumes 41 and 42 of the

series); there is another shorter gap from April 1674 to October 1675 (from the end of vol. 10 to the start of vol. 11). The accounts do not fall neatly into yearly runs. From 1672-5, there is no consistent pattern. From 1676-1710, all years have an account in January. From 1714, all years start in June.

Data input of the labourers' names and days worked from each of these periods gave us 22,039 entries in 402 accounting periods from 1 Oct 1672 to the 24 Jun 1748, about work by 1,011 uniquely identified men, for whom we have names. Since the account books are so well entered, and so well maintained, only 1% of entries gave us a problem where the identification of the labourer was uncertain (2 people with the same name, no 'senior' or 'junior' appellation); 69 of the men in the accounts were described as 'disabled'.

Immediately on creation of the data set, expertly input by Dr Kate Osborne, we could see that the group of labourers were heterogenous in important ways. Labourers appear between one and 547 times in accounts. Only 45 men (under 5%) appear more than 100 times. The modal labourer appears *once* (as do another 174 of his colleagues). 518 labourers appear one to five times.

Our initial hypothesis, on eyeballing the records rested of three related observations. Firstly, some men (there are no women) seemed to persist in the records, working at the Cathedral for a very long time. Secondly, even if men had long 'careers' at the Cathedral their pay was nominally almost absolutely rigid (with seasonal variation) over the more than seven decades of records: 16d. per day during 5 months of the year - on average - at the winter rate, and 18d. per day for the other 7 months of the year - on average - at the summer rate. Boys, disabled men, and messengers got from 6d. to 12.d, and again these rates did not change. Thirdly, we noted that many of those that were present over years seemed to appear in the list of watchmen too. It seemed then that these labourers were not just casual labour, but perhaps a stable (and therefore significant?) team. It looked like there might be an internal labour market for extra work.

The size of the data set has allowed us to test this econometrically and we have produced a Working Paper on tenure where some of this data can be found, which is discussed below [12].

In beginning to analyse the dataset we have found out more about the important questions of skill, working experience, pay, freedom to contract and their contribution to the rebuilding. We also have fragments to report of the men themselves.

III

What did labourers do? Skills.

At St Paul's labourers were - as they had been since at least the time of Inigo Jones and before - directly employed by the clerk-of-the-works but there were also many labourers directly employed by mason contractors on site, and bills from carter John Slyford make clear he directly employed them too. Those directly employed by the clerk-of-the-works seem to have fulfilled all of these roles described by Woodward above, for instance, men "employed in making mortar wheeling rubble to the several hoisting places unloading stone marbles timber & boards burning and beating of plaister cleaning the leads scaffolds making lead and running cramps", but also "watching the dores and counting the loads" [13].

Assisting the masons seems to have been a large, if not the significant part of the year-round work of labourers. Labourers mixed a lot of mortar. They moved things for masons. There are various implications of this. We know there were various experiments with mortars at St Paul's, and their involvement implies that at least some labourers were well monitored - or trusted. Secondly, the provision of labourers as a pretty much permanent onsite resource means that the mason contractors were 'supported', or had resources ready for them when tendering or estimating for labour costs on site. One

question must be then whether there was crossover between cathedral and mason contractor teams, and whether the cathedral offered unskilled men the opportunity to work with and gain skills from craftsmen and skilled contractors. The only route to check this is to see if there are any names which also appear in the known records of masons on site – which are severely limited. The wage books of William Kempster, who worked on and completed the Southwest Tower, including the library and staircase, and became master mason of the cathedral in 1714 (Stephenson 2018, 2020), run from 1700 – 1703 and 1706-1709. There are 11 men in the cathedral's labourers lists who also worked for Kempster. What is surprising is that these men seemed to have also worked for the cathedral after commencing their work with Kempster. Of course, without earlier records we cannot be sure of this. But the direction of movement could easily be either way. If it were from Kempster to the cathedral, this would be surprising as the cathedral paid a marginally lower rate per day.

Labourers also, as Campbell highlighted, did a lot of heavy ground work, and demolition. The records for day work are meticulous, but between 1672 and 1696 the Commissioners signed ninety-three contracts of between £1 and £140 for labouring task work on the site with men who were also employed and paid as day labourers. By signing these contracts, which priced demolition and groundwork by the foot or ton, the labourers accepted risk for managing and completing heavy construction work (subcontracting labour), at profit more than their own day rate.

Examples of task work undertaken by labourers range from measured demolition by the foot to flat rate contracts for specific undertakings. "For taking up onehundred and ninety foot of foundation walls and butterises belonging to the same on the southside of vaults at 6s 8d running measure?" precedes "for taking up the bottom of the staircase and two butterises on southside £2.0.0.". Later "taking down the walls of the same gable and load the cornish stones with the scrolls etc. £16.0.0" (in 1686).

In 1690 "5 tasks, 1071 yds of east gabledown at 6d yd, £26 15s 6d; 40 yds of foundationwall 16d yd, £2 13s4d, 31yds ditto £2 1s 4d, ditto 72 yds £416s0d, digging and throwing 697 yds of earth from Mr Fulkes and Mr Thompson foundation £23 4s 8d. paid in December 1690".

In all about 49 men undertook task work. They were all labouring by the day also, although only some of them worked a high number of days. This sort of task work involved some considerable sums and about 30% of the contacts had at least one signatory who was a labourer who actually signed his name – not just marked. It would not be expected that common labourers would be literate enough to sign at the time so this, alongside the undertaking of financial risk suggests significant human capital. Supporting this conclusion is the fact that, of the names of eleven contracting labourers who took on contracts on the City Churches, (Wren Society Vol. XIII) -William Cooke, James Hurst, John Jay (slater), Thomas Paize, Bartholomew Scott, James Trahern, Edward Hide, John Hoy, John Pledge, Henry Russell, John Simpson- the last five are found in the St Paul's accounts also.

Finally, labourers acted as watchmen in addition to their regular labouring shifts. The St Paul's watch was drawn exclusively from the pool of labourers. This additional duty was potentially a lucrative perk for labourers—a night's watch paid 8d. until 1700 and 12d. thereafter, equivalent to half to two-thirds of a daily wage. Longer term workers were more likely to be given watch work. The number of shifts a labourer could take was capped at two per week or ten per month, increasing their monthly income by c. 15%. That they had watch work, and indeed that they were the sole labour source for the role suggest that longstanding St Paul's labourers were a trusted group in the eyes of the Cathedral, again reiterating the point that they would have had social and human capital.

After 1711 the cathedral moved into a maintenance phase of construction. This phase has yet to be fully analysed, but the work relied less on brawn and more on organisational tasks. The workforce was steadier in the long run with a higher average number of days worked per year.

IV

What were they paid?

The brief answer to this is not as much as has been previously assumed. Stephenson covers this from an economic historian's perspective in some detail [15]. As noted above the rates of 16d. and 18d. per day held until the late 1740s. How these day rates translated into men's income is not a simple matter, however. With such set rates a labourer's income was a function of the number of days he worked. This was influenced by two things: Firstly, seasonality, of which there will be a forthcoming paper which looks at the question across Europe. The average January had only 51% of the number of days worked than one would expect from its length. July to September all had 17-20% more work than one would expect if seasonality did not matter. In short, most men did not have a lot of work in January and February.

The second determinant of income was how many days in each accounting period a man was hired for. This seems to have been the decision of the clerk, who we have shown, favoured longer term workers. The longer a labourer had been working on the site the more days work he got [16].

That tenure or length of employment mattered is illustrated by describing the extreme polarisation of the employment records (Figure 1). Today, construction is a high turnover industry, with worker flows three times higher than manufacturing firms [17]. The monthly worker and job flows for seventeenth and early eighteenth century St Paul's are roughly twice the level seen in modern US data [18], where hires and separations run at around 5.5 per cent of the workforce. The quarterly hiring and separation rates at St Paul's are around 17 per cent of the workforce, compared to around 14 per cent in modern US data. In other words, while construction is always relatively precarious, early modern construction, on the most stable site in the city, was even more so.

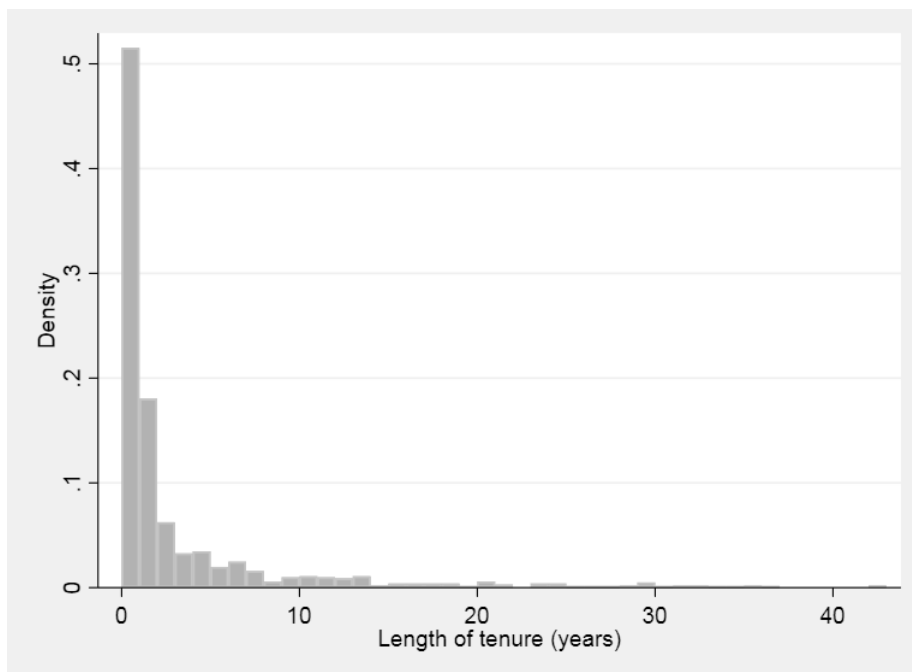


Figure 1: Histogram of employment tenure of cathedral labourers at St Paul's 1672-1748

Of all the labourers in our data set, a fifth were employed at the cathedral for up to a month only, a third were employed for up to two months, and just shy of half were employed for up to three months or less. Yet, at the top of the distribution a small share of labourers worked for long periods: Labourers in the 75th percentile of duration of employment worked for 432 days (over two or more years), and the top decile worked for ten years or more. Twelve men appear in the accounts for a period of thirty or more years, with one, Simon Satchell, who took on task work, and worked the watch, active for 43 years in total.

The system can be described as an internal labour market for work, in an efficiency-wage turnover-management model. Once a man had worked at the cathedral for over a year his employment was likely to stabilise and on average, he worked c.200 days a year. He also experienced less seasonal volatility in employment, giving him a steadier working pattern and income. This, established, steady work is significantly fewer days per year than economic historians have traditionally assumed, but of course, and as the task work contracts indicate, many men were working at other places too or had 'outside options. Stephenson calculates that with 200 days a year at these rates a man would not have been able to support a wife and children but would have had a good standard of living [19]. (Table 1.) It should be noted that hierarchy or differentiation in day wage was virtually non-existent at St Paul's. Opportunities to get paid more per day through joining a more productive or more senior group were virtually nil. There was little opportunity for progression at St Paul's. Therefore, to increase income men had to increase their number of days worked or take financial risk. Becoming regular at the Cathedral was one way to do this.

Table 1. Pay for day labouring in £ per year based on the mean, median and top and bottom quartile of number of days worked

decade	£mean	£ lowest 25%	£median	£ highest 25%
1670	11.1	4.3	12.6	16.8
1680	13	9.5	14	16.5
1690	16.8	14.7	17.6	19.6
1700	19.7	17.6	20	21.9
1710	18.9	15.2	20.9	22.1
1720	19	19.6	21.7	22.4
1730	19	22.1	22.4	22.4
1740	18.2	22.3	22.4	22.4

V

Freedom to contract:

It is apparent that St Paul's labourers were free to contract. And the fact many of them signed contracts, suggests heterogeneity, human and social capital. Tests looking at the pattern of hiring and departure from the site in our work on tenure demonstrate that there were not fixed gangs who were hired in. A very small number of men, however, do seem to have progressed to positions of responsibility or 'foreman', but surprisingly few. There are only 11 men in the labourer's accounts who received day rates above 18d. at any time during the construction period (up to 1710). None of them, apart from clerk-of-the-works are identified or named in the accounts as monitor or foreman, and the pattern of records suggest they may have been specialist hired in for short periods rather than more senior labourers. They include:

Lawrence Spencer called ‘Labourer of Trust’ by Campbell [20]. He appears throughout the accounts and acceded to be clerk-of-the-works, on John Tillison’s death, at the end of 1685. Spencer received 24d.(2s) per day. He signed for labourers pay with John Crismas until December 1685.

Lawrence Spencer Jnr latter period. His name speaks for itself.

John Crismas described by Campbell as the foreman in 1666 [21]. Crismas signed for all labourer’s accounts until 1685 with John Tillison.

Henry Wiggins 2 observations at 22d in 1672. Not seen again.

Edward Stretton 5 observations only at 2s 6d in 1675/ 6. This is brief enough to not be ‘progression’.

William Ireland paid 2d above everyone else once Spencer appears. Listed with Spencer at the end of accounts in 1685. This looks like Ireland may have progressed to be a ‘foreman’. He worked the watch.

John Norrice who is listed alongside Stretton until for 21 days in January 1676 and 25 days in Feb 1676. Not seen again.

John Normand worked 14 days only in January 1683 at 20d. After March 1683 not seen again.

Thomas Cooke paired with Dickinson at the end of accounts once Dickinson appears throughout 1700s. It seems that Cooke ‘progressed’, however he worked only one shift on the watch.

John Widdows from summer 1703 paid 2s per day, and listed at end of the accounts, but he did not work watch.

William Dickenson first observation was at 2s., so began on at higher rate. Worked one watch.

Men who did not get paid any higher rates but who are notable for other reasons were:

William White who signed or witnessed watchman’s wages until September ’85; **Adam Northam** who took over such witnessing or signing until September 1686 (when these stop being signed). And, as mentioned above **Simon Satchell** who worked at the cathedral for 43 years, also signed for the watchmen until 1687.

The fact that only two men seem to have progressed to foreman, and that Dickinson came from outside reinforce the lack of progression or formal career development opportunities at St Paul’s. This is notably different to what we know of the other large European projects studied recently. At St Peter’s, Rome in the sixteenth century there is clear evidence of variable pay rates and hierarchy for labourers [22]. At the Grand Palace, Madrid in the mid eighteenth century there is similar evidence of hierarchy, seniority pay, and variable pay [23]. Gary shows clearly that workers on large city projects in Malmo returned regularly to the site alongside other seasonal employments [24].

The situation is however, similar in many ways to that found at other London sites - Greenwich, Westminster Abbey, Bridge House and those managed by the Office of the Kings’s Works. However, at those sites, there are far fewer numbers of workers, there are not records of labourers paid directly and there are rarely named records, and there is no year-round employment. At Westminster Abbey from 1712 the acting Clerk Ralph Sims billed labourers at 20d. per day [25], but there was an average of only 5 men on site per week in 1712 and 1713, so the chance of being able to stay on site for a long time with regular work like at St Paul’s was limited. St Paul’s was the largest and most consistently active site in London.

VI

Who were they?

With 22,000 observations and over 1,000 labourers we had hoped that we would be able to match our men's names with the records of data sets like the marriage duty assessment, the poll-tax, or the hearth tax or baptismal and other parish records. Frustratingly, matches with all these were almost insignificant – and the matches that were made were usually indeterminate matches because they were for names that were far too common. (For our 1,000 labourers, a cross match on a database of London Middlesex, Surrey, Kent, Essex parish records 1630 – 1730 provided by Dr Neil Cummins (LSE) produced over 12,000 matches) [26]. Work on this continues, but further analysis gives 121 good matches with 71 'perfect' matches; 16 matches based on names and 'average' ages, and 33 matches based on marriage with this database.

Of this group of 121 the average age of commencing employment at the Cathedral was 33, the youngest was 14, the oldest was 60. About 25% were in their teens and about another quarter in their forties. Ten percent of them were in their fifties or older. These varied ages suggests a workforce not chosen for physical characteristics, but rather one made up of heterogeneous skill, brawn and social capital. On such a large project over such a long period we should not make too much of this, but alongside the precarity and polarization of the employment records, one is struck by the heterogeneity of the men themselves, as well as that of their working experience. Of this matched set the average tenure is two and a half years however – longer than that of our total data set.

The implications of our work so far are that labourers at St Paul's were a heterogeneous bunch of men from London (and outlying areas). Their working lives involved a lot of time searching for work. Their average age may have been between 30 and 40 on their arrival at the cathedral, and, many brought considerable experience, with a mix of teenagers and hardy men in their forties mingling in teams. They were not organized as gang labour. On entrance into the cathedral's workforce, most worked at the cathedral for just a few months, but if they were not immediately dismissed and began to work out there, the longer they stayed the more stable career they had the opportunity to build. A stable career at the cathedral offered work most of the year and in times of downturn or seasonal slump these long-term workers were more likely to be rehired than new men. They had various general construction and haulage skills and were trustworthy. Some of them were petty entrepreneurs. However, even the most entrepreneurial would have only supported a family if their wives worked.

References

- [1] J. Campbell, *Building St Paul's*, London: Thames & Hudson. 2007.
- [2] J. Rogers, *Six centuries of Work and Wages: The history of English labour*, London: W.S. Sonnenschein, 1886; R. Allen, 'The Great Divergence in European Wages and Prices from the Middle Ages to the First World War', *Explorations in Economic History*, Vol. 38, no.4, 2001, pp.411-447; G. Clark, 'The Condition of the Working Class in England, 1209–2004', *Journal of Political Economy* 1307-1340, Vol.113, No.6, 2005, pp.1307-1340.
- [3] P.H. Wallis, 'Labour markets and Training', *Cambridge Economic History of Modern Britain*, Cambridge: Cambridge University Press, 2014; J. Boulton, 'The 'Meaner Sort': Labouring People and the Poor', *A Social History of England, 1500–1750*, Cambridge: Cambridge University Press, 2017, pp. 310-329.
- [4] D. Woodward, *Men at Work: Labourers and Building Craftsmen in the Towns of Northern England, 1450–1750* Cambridge: Cambridge University Press, 1995.
- [5] A. L. Beier, 'Engine of Manufacture: The Trades of London, 141-167', A. L. Beier A. L and R. Finlay, *The Making of the Metropolis*, London: Longman, 1986.

- [6] J. Boulton, 'Food Prices and the Standard of Living in London in the 'Century of Revolution', 1580-1700', *The Economic History Review*, Vol.53, No.3, 2000, pp. 455-492.
- [7] L.D. Schwarz, *London in the Age of Industrialisation*, Cambridge: Cambridge University Press, 1992.
- [8] M. Rota and J. Weisdorf, 'Why was the First Industrial Revolution English?' https://warwick.ac.uk/fac/soc/economics/research/centres/cage/publications/workingpapers/2019/why_was_the_first_in_dustrial_reolution_english_roman_real_wages_and_the_little_divergence_within_europe_reconsidered/, 2019.
- [9] M. García-Zúñiga, 'Builders' Working Time in Eighteenth Century Madrid', *EHES Working Paper*, No. 195, 2020.
- [10] Woodward, *Men at Work*, (Note 4).
- [11] The London Metropolitan Archives, LMA CLC/313/1/B/003/25473 10-43.
- [12] M. Paker, J. Z. Stephenson, and P. Wallis, 'Unskilled labour before the Industrial Revolution', *LSE Economic History Working paper*, No. 322, January 2021, <https://www.lse.ac.uk/Economic-History/Assets/Documents/WorkingPapers/Economic-History/2020/WP-322.pdf>
- [13] The London Metropolitan Archives, LMA CLC/313/1/B/003/25473 -14, f12.
- [14] J. Z. Stephenson, '“Real” wages? Contractors, workers, and pay in London building trades, 1650–1800', *Economic History Review*, Vol. 71, No. 1, 2018, pp. 106-132; J. Z. Stephenson, *Contracts and Pay: Work in London Construction 1650 -1785*, London: Palgrave, 2020; J. Z. Stephenson, 'Working Days in a London Construction Team in the Eighteenth Century: Evidence from St Paul's Cathedral', *The Economic History Review*, Vol. 73, No. 2, 2020, pp. 409-30.
- [15] *ibid.* also see Campbell, J. W. P., (2005) 'The Finances of the Carpenter in England 1660-1710: A Case Study on the Implications of the Change from Craft to Designer-Based Construction,' in *L'edilizia Prima Della Rivoluzione Industriale. Secc.Xiii-Xviii*, ed. S. Cavaciocchi (Prato: Istituto Internazionale di Storia Economica), pp. 313-346.
- [16] Paker, Stephenson and Wallis, 'Unskilled labour before the Industrial Revolution', (Note 12).
- [17] S. J. Davis, R. J. Faberman, and J. C. Haltiwanger, 'The flow approach to labor markets: new data sources and micro-macro links', *Journal of Economic Perspectives*, Vol. 20m No.3, 2006, pp.3–26.
- [18] US Bureau of Labor Statistics, 'Job Openings and Labor Turnover, Monthly economic news release', 2020, <https://www.bls.gov/news.release/pdf/jolts.pdf>
- [19] Stephenson, 'Working Days in a London Construction Team', (Note 14).
- [20] Campbell, *Building St Paul's*, (Note 1) p. 42.
- [21] *ibid.*
- [22] Rota and Weisdorf, 'Why was the First Industrial Revolution English?', (Note 8).
- [23] García-Zúñiga, '“Builders” Working Time in Eighteenth Century Madrid', (Note 9).
- [24] K. Gary, 'The distinct seasonality of early modern casual labor and the short durations of individual working years: Sweden 1500-1800', *Lund Papers in Economic History. Education and the Labour Market*, No. 2019, Vol. 189, 2019.
- [25] Stephenson, *Contracts and Pay*, (Note 14).
- [26] N. Cummins, 'Living standards and plague data set', neilcummins.com, 2021.