

6-15-2019

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### Citation Details

Allen, Clarissa. "William Petty and Political Economy, Working Paper No. 17", *Portland State University Economics Working Papers*. 17. (15 June 2019) i + 13 pages.

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# William Petty and Political Economy

## Working Paper No. 17

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A Contribution to the *Working Papers* of the  
Department of Economics, Portland State University

**Submitted for:** EC 560 “History of Economic Thought”;  
15 June 2019; i + 13 pages

Prepared for Professor John Hall

**Abstract:** This inquiry seeks to establish that during the first part of the 1600s, William Petty generated original contributions to political economy. Subsequent to the Irish rebellion and in the wake of the English occupation of Ireland, Petty led a team of surveyors for measuring out areas of Ireland. The survey that he led mapped selected territories and detailed numerous characteristics, thus employing an early, rudimentary, but highly insightful census method. Petty sought to describe his world objectively and quantitatively through the use of numbers, weights, and measures – rather than subjectively. Petty developed a method of calculation still famously known as *political arithmetick*, offering an approach for measuring that helped to establish a foundation for modern statistics. With his efforts in undertaking what is known as The Down Survey, Petty offered a synthesized understanding of territory and its prospects for production potential; based upon identifying key components of national wealth that also included well being of a population.

***Journal of Economic Literature* Classification Codes:** B3, B31, O1, O5

**Key Words:** Country Studies, Development, Economic Thought, William Petty

This inquiry seeks to establish that during the 1600s William Petty generated original contributions to political economy. Petty (Blaug, 1986, 187-188) was born to a poor English family and as a teenager went to work on an English merchant ship. He suffered an accident and was set ashore in France where he was taken in as a student at the Jesuit college. Petty continued his studies in Paris and London and became a medical doctor. He was appointed to the position of army physician in Ireland, which was under English rule. Petty would remain in Ireland for some years while completing the Down Survey of Ireland, which is the earliest of Petty's contributions to political economy. Petty's appreciation for quantitative methods of estimation led him to develop political arithmetick, which laid the foundation for modern statistical techniques. Throughout his work, Petty formed an understanding of territory, production potential, and development prospects and was through this he helped to advance an understanding of components of national wealth.

### **Petty's *Down Survey***

William Petty was appointed to be the physician to the English army in Ireland during the English occupation of Ireland. The English occupation of Ireland was funded through monetary advances from wealthy individuals. Once the Irish rebels were suppressed their land was taken by the English and given as repayment

of the monetary advances, as well as to soldiers of the English army serving in Ireland. The English army needed to survey and divided up the land in order to give appropriate payment. In *The Economic Writings of Sir William Petty Together with the Observation Upon the Bills of Mortality More Probably by Captain John Graunt* [1899] Charles Henry Hull (1963, xvi-xvii) teaches us that the task to survey the forfeited land in Ireland was started by Benjamin Worsley. Petty found the Worsley's methods to be absurd and proposed that he could do a better job. After much debate it was decided that Petty would complete the survey.

Petty was awarded the contract to survey all the forfeited land in the Leinster, Munster, and Ulster provinces of Ireland. In *The History of the Survey of Ireland Commonly Called the Down Survey* [1851], Petty (1967, 13-15) includes the details of his survey contract. Petty was directed to distinguish between profitable and unprofitable lands. Within the profitable land, he was to categorize the type of land as farmable, meadow, and pasture. The unprofitable land should be designated as woodland, bogs, or mountain. Profitable land was to be scrutinized to the smallest possible measurement so that the area and boundaries would be known. Maps and reference books of the survey were to be created for the use of the State and also given to the new land owners.

Petty (1967, 17-18) used a method for completing the survey in which the work is divided into different tasks. The tasks include field work, protracting,

casting, reducing, mapmaking, writing books, and examining all completed work. He employed more people than necessary in order to avoid negligence and unfaithfulness to the project. Petty hired foot soldiers to do field work, since they were accustomed to working in unpleasant environments.

Petty (1967, 46-49) teaches us that profitable land was measured out in 40-acre increments. Unprofitable land was measured in 500-acre increments. All boundaries of the land were to be noted (wall, bank, ditch, river, church, castle, house, etc.) Surveyors were to make note of the highways, rivers, waterfalls, islands including their span and depth. Maps were specified to be drawn on large single sheets of paper with a scale of forty perched per inch.

The survey was not without controversy. Petty (1967, 20) tells us that Worsley thought hiring army soldiers to carry out field work was a conflict of interest since the land they were surveying would be used to pay fellow soldiers. Perhaps they would be dishonest in their findings. Petty's counterargument was 1) that soldiers were physically best suited for the job 2) that it would be easy for the state to know if the soldiers falsified their documents 3) since only field measuring were being performed, the only way for soldiers to falsify their measurements would be to use false measuring chains, which could also be easily discovered 4) the soldiers did not know which land was theirs, so it was not in their interest to falsify documents 5) Petty was doing the best he could with limited workers and

had to be confident in his methods. Worsley continued to argue against Petty's methods and seemed to look for errors in Petty's work.

Petty's criticism of Worsley's early work on the survey is what led him to be awarded the contract to begin with. His criticism of Worsley was 1) the payment Worsley was receiving for the survey was excessive 2) there was no method of checking for accuracy in his work 3) there was no way to be sure that his work was correct.

Upon completion of the survey, Petty (Blaug, 1986, 188) received payment for his work, which included land in Ireland. He purchased additional land and was able to build some wealth. After this, Petty split his time between Ireland and England. He was a member of the Royal Society and a Member of Parliament. He was knighted in 1661 by Charles II, for whom he worked as an advisor. Petty continued his writings and served as an advisor to James II, until Petty's passing in 1687.

### **On Political Arithmetick**

Petty (Hull, 1963, lxiv-lxviii) sought information about his world through the use of numbers, weights, and measures stating verbal measurements like "much bigger" were subjective and did not hold an exact value. Petty formed a method of calculation called political arithmetick which helped form the foundation of

statistical analytical practice. Petty admits that his method of calculation is unusual, but his intuition about variables which affect outcomes was strong. Being a results-driven man, Petty was known to contrive numbers for the purpose of completion, and his data was often incomplete. Ireland was the perfect location for Petty to practice his political arithmetick experiments. The land was new to British rule and had not yet developed complex institutions. For example, Petty was able to examine what happened when certain laws were enacted or when tax changes made. His positions with Parliament and as advisor to the king allowed him to make recommendations based on his estimations.

Petty gets creative with political arithmetick when he estimates the population of England by use of the number of deaths in London. Petty (Blaug, 1986, 187) first assumes one out of 30 Londoners die every year. He multiplies 30 by the number of burials in London. He then multiplies this figure by 8, which is the proportion of the taxable value of London compared to the rest of England. While this calculation did not invoke confidence in political arithmetick, it did create space for other thinkers to develop more accurate methods of estimation.

The strength of Petty's political arithmetick is that his formulas are sound. He is able to separate the significant variables of an issue into meaningful components. For example, Petty (Hull, 1963, lxxi) identifies the value of land, houses, shipping, cattle, and money as components of national wealth. He also

includes the human capital in this equation. Petty identifies money as a common denominator of land and human capital value. However, people are not slaves, nor does a labor market exist, which makes it difficult to place a monetary value on human capital. This leads Petty to create calculations on the value of human capital. Petty assumes the national expenses of England to be 40 million pounds per year. He estimates the annual proceeds of the nation to be 15 million. The remaining 25 million must then be made through the labor of the people. While the numerical values Petty gives are likely inaccurate, his intuition regarding the components of national wealth are sound.

In *Political Arithmetick* [1690] Petty (Hull, 1963, 232-313) accounts for many aspects of the English economy. He discusses the value of land, buildings, people and various occupations, taxes and public revenue, banks, shipping and the navy and compares them to that of Holland, Zealand, and France. Like many of Petty's writings, it was compiled from his papers and published after his death. Petty's colleagues at the Royal Society recognized the importance of his work and urged him to publish. Petty had already suffered an unauthorized reprinting of another of his writings. There were several copies of *Political Arithmetick* and after Petty's passing, demand for and a legitimate edition grew. This led the Lady Petty and his friend Southwell to finally publish this writing.



Of the topics Petty discusses in *Political Arithmetick* his writings about the number of laborers and how to employ the unemployed is most pertinent to this inquiry. Petty (Hull, 1963, 307-309) estimates if all the available workers in England were employed, national income would increase by two million. Furthermore, there are plenty of jobs for these workers. He excludes young children from this estimation since they are not expected to work. He also says that people of certain titles and positions are also exempt from labor as their duty is to govern and direct the labor of others. Petty accounts for sick days and time off. He averages the earnings then compares the population of England with the population of Norway for his final estimate. Once again Petty displays mathematical creativity, if not accuracy, in his findings. He identifies variables and compares them to a similar population. This is the beginning of statistical analysis.

### **Petty's Understanding of Development and Territory**

Petty's time in Ireland and his work on the Down Survey informed his understanding of territory, production potential, and prospects for development. In *The Political Anatomy of Ireland* [1672] Petty (Hull, 1963, 156) recognizes that Ireland is very much a developing country. He notes that when the English first invaded Ireland in about 1100, there was no evidence that the Irish were intellectually advanced. They had no arts, mathematics, military, or navigation

skills, only legends and rituals. At the time of his writings 500 years later, many Irish still lived in squalor. Petty sees this as positive opportunity for both the English and the Irish.

In *Verbum Sapienti* [1691] Petty (Hull, 1963, 103-120) elaborates on his calculation of national wealth and expenditure. He connects national income to the well-being of its population, suggesting national investment in improved living conditions. Better living conditions would lessen the spread of disease and improve the health of the population. Healthy people are able to work more, producing more of their wares and contributing more to the overall wellbeing of society. Illness and disease fester in poor living conditions, depleting the nation not only of population and resources, but any future wealth that would have been earned had the population been healthy to begin with. Petty suggests that a small population is true poverty. He deems Ireland to be under-populated and presents it as a mutually beneficial opportunity for the English and Irish.

Petty continues his work connecting the benefits of Irish/English partnership, furthering his understanding of national development. Petty (Hull, 1963, 123-156) teaches us that the Irish will benefit from an English presence since the English are a more advanced society. He begins by detailing the land, people, types of work and characteristics and distributions of each. From there, he estimates the current needs of the people using clothing, food, religious

establishments, land for food and livestock in his measurement. Then he subtracts the needs of the people from the estimated land that is available and fit for use. The English could come to Ireland with their wealth, advanced knowledge, and skills and make use of the natural resources. In turn, the Irish population would grow with the mixing of the two peoples. To the English who argue against investing in Ireland on the grounds of another Irish rebellion, Petty counters that the Irish would not rebel because of the benefits of advanced society that the English had brought. Further, Petty admires the soldierly men of Ireland and how it would benefit England for the two armies to join.

Ireland and England would further benefit through national trade. Ireland simply needs more money in order to trade. Petty (Hull, 1963, 113) teaches us that money is necessary for trade artfully saying, “For money is but the fat of the Body-Politick, where too much doth as hinder its agility, as too little makes it sick”. Further, Petty (Hull, 1963, 175-190) raises the argument that money in Ireland is decreasing because the country’s imports are greater than their exports. However, in order for trade to develop, people first need better living conditions. The Irish are skilled in some areas and the land is resourceful enough for the exportation of cattle, corn, fish, leather, wool, linen, butter, cheese, metals and minerals. The problem is that without improvements, goods are produced and stored in terrible conditions and should not be traded.

Other arguments as to why money in Ireland is decreasing are that one quarter of land owners in Ireland reside in England and that the army of Ireland is paid from Ireland but sent to England for duty. Petty (Hull, 1963, 193) addresses these topics saying simply that it is unfair to assume that people will spend their earnings on the place that paid them.

Regarding money and taxes, Petty (Hull, 1963, 190-193) argues that the poor are disadvantaged in having to pay taxes. The proportion of their income paid to taxes is relatively high. This leaves very little for them to subsist on, which is not much. The poor Irish made most things they need themselves. They raised cattle for milk and dairy products which are produced and consumed at home. They made wool into cloth that is dyed with things from nature. The diet of the Irish was bread, potatoes, seasonal seafood, and the occasional chicken or rabbit. They did not eat large animals since they have no method of safely storing the meat. Tobacco, along with sneezing, was the indulgence of the Irish. For these reasons, Petty suggests the poor pay their taxes in labor hours rather than money. The poor could schedule their labor-payment during a time that is fitting for them, rather than being surprised by the tax collector.

## **Conclusion**

This inquiry had sought to establish that during the 1600s William Petty did generated original contributions to political economy. Petty's original contributions have been shown to include his work on the Down Survey, his experiments with political arithmetick, and in his understanding of territory and development Petty recognizes that the components of national wealth begin with the well being of a population.

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