Petty's Place in the History of Economic Theory

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The economic and statistical writings of Sir William Petty (1623-1687) are only a fraction of the total output of his diligent pen. Still their bulk is as great as that of Ricardo's *Principles* and nearly twice that of Menger's *Grundsätze*.(1*) To give an exhaustive account of them in the pages of this Journal is, therefore, impracticable. Lack of space equally with lack of knowledge precludes likewise the indication here of all the actual or possible relations between them and the writings of later economists. This is, however, by no means a ground for unmixed regret. Laborious disentanglement of the course of thought concerning this or that economic problem has, no doubt, its usefulness. But the value of such elaborate *Dogmengeschichte* as has been produced by Zuckerkandl.(2*) and Bergmann(3*) -- I select two writers who assign to Petty a prominent place -- seems to lie quite as much in the intellectual stimulus afforded by a comprehensive survey of the subject from differing points of view as in any contribution made to our understanding of the way in which knowledge grows or theory accretes. No doubt a closer and closer interfiliation of theories does take place as the class of professional economists becomes more numerous and active, the discussions in journals more frequent and animated. But two hundred years ago our apparatus for conserving and incubating economic ideas did not exist. Writers of that day for the most part turned their attention but casually to the field of economic pamphleteering, and were as disregardful of their predecessors as their successors were of them. In treating of a seventeenth-century economist, therefore, I believe that more false inferences will be avoided than truths overpassed by refusing to recognize any lines of descent except those that can be clearly proved in court.

I

William Petty was born May 26, 1623, at Romsey, in Hampshire, where his father was a poor clothier. Like many another English refugee during the Civil War, he made his way, by various shifts, to Utrecht and Leyden. There, as well as in Amsterdam and Paris, he studied languages, chemistry, and medicine. In 1648 the Parliamentary party, bent upon reorganizing Royalist Oxford, made him Fellow of Brasenose College, and soon afterwards Professor of Anatomy. Two years later he was further advanced to be physician for the army in Ireland, and soon became a confidant of Henry Cromwell, whom he served as clerk of the council at Dublin until shortly before the Restoration. While there he executed with great success the famous "Down Survey"(4*) of the forfeited lands of the rebellious Irish. Incidentally he speculated in land debentures and laid the foundations of his large fortune. In 1661 he was knighted by Charles II; and, finding a little leisure for the first time in a decade, he turned his attention once more to science. He helped to organize the Royal Society, in whose prenatal activities he had participated at Oxford. He read several papers before it. He experimented at length with a "double bottom boat," which seems to have been a sort of catsmarsh. In 1666 he resumed his residence in Ireland. There lawsuits about his lands and the demands of the flourishing "industrial colony of Protestants" which he had established at Kenmare in Kerry took most of his time for the ensuing twenty years. He was able, however, to make repeated and prolonged visits to London, and to agitate with vigor for fiscal reforms in Ireland. But the exchequer of Charles II could ill afford to reject any proposal, however harmful to that island, which promised ready cash at Whitehall; and Petty's arguments in favor of the direct collection of taxes and of establishing a statistical office fell upon deaf ears. The accession of James II, who as Duke of York and Lord High Admiral had taken an interest in Petty's shipbuilding experiments, greatly raised his hopes of ultimate success; and he put forth a dozen essays to prove his ease. But he was destined to renewed disappointment, and died December 16, 1687, his public aims unachieved.(5*)

Of Petty's abilities his friends held an exalted opinion. Evelyn, for example, declared him so exceedingly nice in sifting and examining all possible contingencies that he ventured at nothing which was not demonstration. There was not in the whole world his equal for a superintendent of manufactures and improvement of trade or to govern a plantation. "If I were a prince, I should make

him my second counsellor at least. There is nothing difficult to him .... He never could get favor at court because he outwitted all the projectors who came near him. Having never known such another genius, I cannot but mention these particulars among a multitude of others that I could produce."(6*)

The following are the titles of Petty's economic writings, with the probable years of their composition and the dates of their first publication. It will be noted that several of the most important were not printed until after his death.

A Treatise of Taxes and Contributions. Written and printed in 1662.

Verburn Saplenti, or an Account of the Wealth and Expences of England, and the Method of raising Taxes in the most Equal Manner. Written in 1665, printed 1691.

The Political Anatomy of Ireland. Written in 1671-72, printed 1691.

Political Arithmetick, or a Discourse concerning the Extent and Value of Lands, People, Buildings,... etc. As the same relates... to the Territories of ... Great Britain,... Holland, Zealand, and France. Written 1672-76, printed 1690 (and surreptitiously by a "pirate" of those days in 1683).

Quantulumcunque concerning Money. Written 1682, printed 1695 (and perhaps in 1682. Writings, ii. 438, 639).

Another Essay in Political Arithmetick concerning the Growth of the City of London. Written 1682, printed 1683. (The first essay is lost.)

Observations (and further Observation) upon the Dublin Bills of Mortality. Written and printed 1683 and 1686.

Two Essays in Political Arithmetick concerning London and Paris. 1687.

Observations upon the Cities of London and Rome. 1687.

Five Essays in Political Arithmetick. 1687.

A Treatise of Ireland. Written 1687, printed 1899.

The list is divisible into three chronological groups, each corresponding to a distinct period in Petty's life, and containing books that have a common provocation and common characteristics. The first group was produced in London after Petty had given up his arduous positions as physician to the army, surveyor of Ireland, and clerk of the Irish privy council, and before he was obliged to return to that island in order to defend the title of his lands in the Court of Claims. The two pamphlets of this group are directly due, respectively, to the fiscal discussions ensuing upon the Restoration and to the expensiveness of Charles II's first Dutch war. Their characteristic subject, accordingly, is taxation. But they contain such digressions to other topics as constitute them, for the student of economic theory, the most interesting of all Petty's writings.

The second group contains his best-known pamphlets, *The Political Anatomy of Ireland* and the

Political Arithmetick. They were written in Ireland after his affairs there had settled into a satisfactory prosperity and he once more had leisure to exercise his mind upon those topics that he especially loved. The direct impulse to their writing came from Dr. Edward Chamberlayne's *Present State of England*, published in 1669, -- a book, by the way, which seldom receives nowadays the attention that it deserves. In January, 1671, when a new edition of Chamberlayne's work was in prospect, Sir Joseph Williamson, later principal secretary of state, suggested to its author the addition of some matter regarding Ireland. Chamberlayne appealed for assistance to Petty, who chanted to be in London at the time; and Petty appears to have been so pleased with the idea that he decided to carry it out himself. Soon thereafter he began another pamphlet treating of England. To this he gave the title *Political Arithmetick*, which his work has made famous. This title, too, has the advantage of characterizing for us the entire output of his second period of activity as an economic writer. The *Political Anatomy* and the *Political Arithmetick* are the forerunners, if not the direct ancestors, of eighteenth-century "statistics," the Staatenkunde of Ashenwall and Schlözer.

The more numerous but briefer pamphlets of the third group were written, with one exception,(7*) during such visits as he made to London, after 1682, to work for reforms in Ireland, and incidentally to enjoy the company of his friends in the Royal Society. Their external provocation is to be found in the relation existing between the Courts of Versailles and Whitehall, and especially in the dispute whether London were a larger city than Paris. Their character is due to their lineal descent from Graunt's *Observations upon the Bills of Mortality of London*. It may best be described by saying that they are not merely the forerunners, but the direct ancestors, of Siissmilch and of modern vital statistics.

The *Natural and Political Observations made upon the Bills of Mortality, by Captain John Graunt, citizen of London*, 1662, bear so intimate a relation to this third group of Petty's writings, and they are themselves of such importance in the history of statistics, that, if they were really written by Petty, as some assert, he should not be deprived of the credit which their author unquestionably deserves. There is not space here to discuss the disputed question as to their authorship. After a survey of the evidence on both sides, which I tried to make comprehensive,(8*) the conclusion was reached that Graunt alone was the real author of the book. Petty probably assisted him with a medical comment here and there. He procured from Romsey some important figures for Graunt's use; and he may have revised or even have written the "Conclusion" of the *Observations* and their curious dedicatory epistle addressed to Sir Robert Murray, president of the Royal Society. But the chief credit of the *Observations* he must yield to his friend Graunt. Assuming, then, that the *London Observations* were written by Graunt, we may note that a fifth edition, issued in 1676, three years after his death, was prepared for the press by Petty. Petty was thus reminded of his own investigations of the Dublin bills, made shortly after the first publication of Graunt's book, and upon them and the later bills of London and Paris he soon based the eleven *Essays in Political Arithmetick* which form the third group of his writings. They are all descended, in this way, from Graunt's *Observations*; and at the beginning of the first of them Petty himself acknowledges their paternity. "The Observations upon the London Bills of Mortality," he says, "have been a new Light to the World; and the like Observation upon those of Dublin may serve as Snuffers to make the same Candle burn clearer."(9*)

II

The claim of Petty's writings to economic recognition rests upon a twofold basis: first, upon their method; second, upon their content. The method is named first, not because it is more important than the content, but because, being a statistical method, and as such inapplicable to many subjects, it restricts to some extent the content of the writings. This restriction, it should be borne in mind, was much more considerable in Petty's day than it would be in our own, because the masses of raw material for statistical treatment which now lie open upon every hand were at that time almost altogether wanting. Petty's predilection for a statistical method is due, I fancy, to the influence of Bacon, which was predominant among his scientific associates in the inchoate Royal Society. Like all Baconians, he believed in the usefulness of observations, and, by implication, in the uniformity of nature, and looked forward with confidence to the time when a precise knowledge of the external world should lay firm foundations for invention, and thus introduce the rule of man. Accordingly, he

was unwearying in suggesting accurate physical and chemical experiments, many of which he himself assayed to perform. When, in a session of the Royal Society, some one chanced to use the words "considerably bigger," he characteristically requested that thenceforward "no word might be used but what marks either number, weight, or measure."

In the field of his particular interests he sought the same quantitative precision which, as a true Baconjan, he demanded of his scientific colleagues. He had a dear notion both of the end at which he aimed and of the means by which it must be achieved. "The Method I take," he says, "is not very usual; for, instead of using only comparative and superlative Words, and intellectual Arguments, I have taken the course (as a Specimen of the Political Arithmetick I have long aimed at) to express myself in Terms of *Number*, *Weight*, or *Measure*; to use only Arguments of Sense, and to consider only such Causes, as have visible Foundations in Nature; leaving those that depend upon the mutable Minds, Opinions, Appetites and Passions of particular Men, to the Consideration of others: Really professing myself as unable to speak satisfactorily upon those Grounds (if they may be call'd Grounds), as to foretel the cast of a Dye; to play well at Tennis, Billiards, or Bowlee (without long practice,) by virtue of the most elaborate Conceptions that ever have been written *De Profectilibus & Missilibus*, or of the Angles of Incidence and Reflection."(10*)

At many other points he returns to the idea that quantitative precision is necessary in economies as in other sciences. For example, the first chapter of the *Treatise of Ireland* contains "six points" which the author proposes to establish. In the second chapter we encounter, in twenty postulates, "the state of the case represented in terms of number, weight, and measure, and thereby made capable of demonstrations." And in the third chapter "the 6 first mention'd points are proved out of the 20 suppositions or assertions next before going." It must not be supposed that the pseudo-geometrical form of Petty's argument is either important or novel. On the contrary Roger Coke's *Treatise wherein is Demonstrated that the Church and State of England are in Equal Danger with the Trade of* it (London, 1671) -- the very book against which Petty's *Political Arithmetick* was specifically directed -- is more strictly Euclidian in form than anything that Petty wrote. But Coke's demonstrations rest, in every ease, upon "comparative and superlative words," not upon quantitative determinations.

Judging from Petty's professions, we might expect his works to show the strictest of statistical methods. But, as has already been said, trustworthy numerical data of social interest were far more scanty at the time when Graunt and Petty began statistical investigation than they now are. No census of England had been taken. Since Domesday no complete survey or valuation of the lands had been made. Even the amounts of imports and exports were inaccurately known. Petty was unceasing in his demands for more precise information. With that end in view he drew up a schedule for the improved registration of births, marriages, and deaths in Dublin, and tried in vain to secure royal approbation for an Irish statistical office. He saw clearly that government alone could ascertain the desired facts, and that governors would profit greatly thereby. "Until this be done," he adds, "trade will be too conjectural a work for any man to employ his thoughts about."(11*) Meanwhile he made the best practicable use of such materials as were at hand, anatomizing Ireland with "only a commin Knife and a Clout, instead of the many more helps which such a Work requires." In one field alone was it possible to find a body of statistical data sufficiently extended and complete to warrant confidence in deductions properly made from it. For more than half a century the Company of Parish Clerks had kept weekly and annum records, in considerable detail, of births and deaths occurring in and about the city of London.(12*) Upon these so-called "bills of mortality" Graunt had based the London *Observations* already mentioned. The most fertile field being thus pre-empted, Petty was obliged to cultivate ground whose arable spots were few and far separated. It is, indeed, surprising how slight his materials were. A few scattering bills from Dublin and Paris, hap-hazard returns of customs,-- collections and the hearth tax, here and there a guess as to the area of a city, that is substantially all. Under these circumstances Petty had recourse, whenever he could not determine directly the number, weight, or measure of some fact under discussion, to that substitute for direct enumeration which distinguishes his *Political Arithmetick* from modern statistics. Statisticians enumerate: he multiplied. The value of his results varies according to the nature of the terms employed.

For example, in the absence of a census he was forced to reckon the population of London, of England, and of Ireland. So far as London is concerned, he had as a basis certain facts -- the number of burials and the number of houses -- which bear some relation to the number of people. He then multiplied the number of burials by thirty,(13*) satisfying himself by quoting Graunt's authority for that number. The result thus obtained he sought to confirm by multiplying the number of houses by a faetor assumed to represent the average number of inhabitants to a house. This factor is sometimes six(14*) and sometimes eight,(15*) as chanced to suit his purpose. He next assumes that the population of England is eleven times that of London, or 7,369,000, because London pays one-eleventh of the assessment, and asserts that the results thus obtained "do pretty well agreee" with the returns of the hearth and poll money and with "the bishops late numbering of the communicants." He does not himself give any of these figures; but it has been discovered(16*) that, according to the accepted rules of political arithmetic, the bishops' enumeration accounted for only 82 per cent of the number that Petty calculated. In all these cases, however, there is some real basis for his calculations; and Petty was himself under no delusions as to the accuracy of his result. Thus he says, "Although the said number of 7 millions, 369 thousand, be not (as it cannot be) a *demonstrated Truth*, yet it will serve for a good *supposition*, which is as much as we want at present."(17*) Both the strength and the weakness of his method are abundantly exemplified in his writings. Such of his terms of number, weight, and measure as result from actual enumeration are often the basis for conclusions of value; for he had large capacity for distinguishing the essential from the incidental in any economic problem. But the obstacles in the way of enumeration were, in almost all quarters, insuperable even to so energetic and resourceful a man as Petty; and, while he repeatedly demanded governmental assistance in his quests, his eagerness for results too often led him to resort, in the absence of specific facts, to calculations that were nothing more than guesses. Whenever he took time to consider them, he recognized keenly enough their conjectural character. "I hope," he writes to Aubrey, "that no man takes what I say about the living and dying of men for a mathematical demonstration."(18*) But, when the afflatus was on him, he was prone to take what he said for a mathematical demonstration himself. He did not hesitate to advance, in all seriousness, the most astounding proposals for increasing the national wealth of the three kingdoms by a wholesale deportation of the Irish and Scotch into England, -- proposals based solely upon the results of a complicated series of guesses and multiplications. Still, we may not condemn him without mitigation. He was a beginner; and his mistakes in method, if not in advocacy, are not without their modern analogies. The neatness with which industrial facts can be represented by the use of mathematical terms, integral, symbolic, or graphic, carries undeniable advantages for purposes of analysis. It helps to keep ideas distinct and uniform. It throws light upon their possible permutations and combinations. But this very neatness has its dangers. The mistakes of political arithmetic may be repeated by sociological geometry and economic calculus. An investigator may fancy his problem solved when it is merely restated in a new form. The new and nearer form may be a step toward eventual solution. Achieved solution it generally is not.

The influence of the statistical method, as exemplified in Graunt's *Observations* and in Petty's writings, can be traced in two directions. One springs primarily from Graunt, flows through Petty's *Essays*, and leads, as has already been said, to modern vital statistics: the other proceeds from Petty's *Political Arithmetick* through Davenant and Gregory King to Arthur Young and Chalmers. It has perhaps affected even Sir Robert Giffen. Parallel with it goes the development of the German *Universitäts-statistik* from Conring to Achenwall and Schlözer, whose relations to English political arithmetic have not been fully worked out. So far as I can see, the German discipline was at no time superior to the English in any respect save in the possession of the name "statistics." And Knies has forced it to yield up that.

In the field of vital statistics the connection from Graunt to Süssmilch can be traced without a break. The extent to which Petty's *Essays* depend upon Graunt has been noted already. The next link in the chain is Edmund Halley's .*Estimate of the Degrees of Mortality of Mankind*, which was published in 1693 in the *Philosophical Transactions of the Royal Society*. From this paper springs modern life insurance. It cannot be doubted that Gaspar Neumann materially assisted Halley by furnishing him figures for a stationary population from the Breslau bills, and it seems clear that Halley's suggestions were less esteemed in England than in Germany in the years immediately succeeding their publication.(19*) It is nevertheless true that Halley published the first real life table, and that he mentions at the outset of his paper the prior work done upon the bills of mortality by Petty and Graunt. After Halley the next writer who acknowledges his indebtedness to them is the Rev. William

Derham (1657-1735), who was also a member of the Royal Society. Derham was appointed to lecture upon the famous Boyle foundation for proving the Christian religion against atheists, deists, pagans, Jews, and Mohammedans; and, as became a scientific clergyman of the pre-Darwinian era, he decided to demonstrate the being and attributes of God from his works of creation. While in the midst of that great argument, a chance reading of Graunt's book drew his attention to the constant relation subsisting between marriages, births, and burials. He recognized at once that this was but an admirable plan and management to keep the balance of mankind even; for, says he, "what can the maintaining throughout all ages and places of the proportions of mankind and all other creatures, this harmony in the generations of mankind, be but the work of One that ruleth the world?"(20*) Derham's lectures in no sense constitute a statistical work; and his incidental comments on Graunt and Petty would be unimportant in the history of statistics, had not their theological setting brought them to the hands of a Prussian military chaplain named Johann Peter Süssmilch. Süssmilch himself says that *die göttliche Ordnung in den Veräinderungen des menschlichen Gteschlechtes* first became clear to him while he was reading Derham's book; and he thereupon sent to England for the writings of Graunt and Petty, which were mentioned by Derham, and was in large part guided by them in producing his famous work. In view of these facts it is clear that the German historians of statistics are mistaken in making Süssmilch the father of vital statistics.(21*) The true beginnings of the science are to be found in the *Observations on the Bills of Mortality* of London. The author of that book thoroughly appreciated the importance of his work. He is the creator of statistics quite as truly as Boyle among his contemporaries is the father of chemistry, or Ray of botany, or as Newton was the originator of calculus. And it is not too much to say that no subsequent statistician has as yet modified Graunt's work so fundamentally as Lavoisier did Boyle's, or Linnaeus Ray's, or as the application of the method of limits modified the Newtonian fluxions.

If we turn to the history of political arithmetic in England, we find the influence of Petty alone as clear and decisive as was the joint influence of Petty and Graunt upon vital statistics. Davenant declared that Petty first began the application of this art to the particular objects of revenue and trade, in which he had as yet been followed by very few.(22*) If there had been open to the industrious doctor such opportunities to examine the correspondence of Southwell, Williamson, Sir Peter Pert, Halley, and Justel as the student now enjoys, he might have been led to modify his belief that nobody but Gregory King and himself appreciated this side of Petty's activities. Yet it must be admitted that King and Davenant, working as they did under the direct influence of Petty upon the fuller data afforded by a new financial policy, brought the art to the highest pitch which it ever reached. Their followers, with the possible exception of Arthur Young, exaggerated its methodological fault of multiplying conjectural averages to secure aggregates instead of deducing the averages from aggregates directly enumerated; and when the income tax and the census of 1801 afforded more accurate estimates of national wealth and of population, political arithmetic was driven forever from its two chosen fields. It is probable, however, that the interest which it had excited and the suggestions which it had evolved contributed not a little towards making a census possible both in England and elsewhere.

III

The content of Petty's work was more and more restricted by his method as fondness for terms of number, weight, and measure grew upon him. The first group of his writings, therefore, exhibits greater variety of topic than the later ones, and is far more interesting to the student of economic theory. As he passed from the field of taxation, with its fascinating speculative problems, to the descriptive and comparative pamphlets of the second period, economic digressions became fewer and fewer, and he occasionally introduced information of trifling importance for no other apparent reason than that it could be given in numerical terms. In the third group he confined himself almost exclusively to questions of population, and, except in the *Quantulumcunque concerning Money*, added practically nothing of economic interest to these earlier books. It is, therefore, in the Treatise of Taxes that we must look for Petty's economic ideas. No English book before Hume better deserves the attention of the economist.

Roughly speaking, Restoration finance rather confirmed than introduced fiscal innovations. Pym's exercise was continued in fact, if not in form, by the hereditary and temporary excises granted to the crown; and the most productive parts of the Commonwealth's customs were reenacted, though with significant changes, by the Great Statute. On the negative side, too, the Restoration Parliament recognized what the Long Parliament had accomplished. The Court of Wards and Liveries and the royal rights of purveyance and pre-emption were not revived. But even the accustomed taxes had a new aspect now that they were no longer the exactions of "the usurper," and the addition of the poll tax and the hearth money introduced elements essentially new. Under the circumstances it is not surprising that taxes and contributions should have elicited Petty's first economic tract.

It would lead too far afield to canvass all the comments and suggestions which Petty makes upon the subject of taxation. His general view is clear. People should pay "according to the share and interest they have in the Publick Peace; that is, according to their Estates or Riches: now there are two sorts of Riches, one actual, and the other potential. A man is actually and truly rich according to what he eateth, drinketh, weareth, or any other way really and actually enjoyeth; others are but potentially or imaginatively rich who, though they have power over much, make little use of it; these being rather Stewards and Exchangers for the other sort, than owners for themselves."(23*) This idea underlies and shapes all his discussions of taxation. But he makes very different uses of it in the *Treatise of Taxes*, written in 1662, and in the *Verburn Sapienti*, written three years later, and he arrives at widely divergent administrative conclusions in consequence. In 1662 he saw no way of distributing the burden of taxation in proportion to the citizens' expenditures save by taxing those expenditures themselves. Accordingly he demanded, in the name of "natural justice," a heavy, if not an exclusive excise. By 1665 he had made distinct progress beyond this naive administrative notion. Reflection upon Graunt's calculations of the number of people in England had apparently suggested to him -- at any rate, he had come to see -- that the whole income of the nation could be estimated from the number of the people and their expenditures. The idea proved alluring. He expanded it at once, and returned to it again and again, working it out ingeniously and gliding over its difficulties.

The income of individuals is, of course, less than their expenditure by the amount of their savings; but if that objection occurred to him at all, he probably thought that his distinction between potential and actual riches met it well enough. He therefore considered that expenditure measured income. Now income must flow either from property or from labor. The first step, then, is to determine the amount of expenditure; the second, to ascertain from what sources this expenditure is chiefly met. This done, taxation may be imposed, either directly upon the expenditure or upon the property which makes the expenditure possible, as administrative considerations may dictate. He assumes, accordingly, that the average of annual expenditure in England is £6 13s. 4d. per capita. No ground whatever is assigned for this assumption; and I cannot help suspecting that he reached it by guessing at a total annual expenditure of 40 million pounds and dividing that sum among an assumed population of 6 million people.(24*) However that may be, he established to his own satisfaction that the people of England spend 40 million pounds per annum, and are really and actually rich in proportion. He next inquires in what their wealth consists. The lands, houses, cattle, goods, ships, and money of the country are separately valued, giving a total of 250 millions, which is supposed to yield its possessors 6 per cent; or 15 millions yearly, out of the 40 millions which the community spends. The remaining 25 millions must be due to labor. Now the people who perform this labor are as valuable as would be the fee of lands renting for what they earn; "for, although the Individiums of Mankind be reckoned at about 8 years' purchase, the Species of them is worth as many as Land, being in its nature as perpetual, for ought we know."(25*) The people are therefore worth 416 millions as against 250 millions for "the stock of the kingdom."(26*)

This enables him to substitute for the exclusive excise which he formerly advocated a system of taxes whereby five-eighths of the amount required shall be levied upon the people and three-eighths upon the stock, land paying 21 per cent of the whole, personal estates 6 per cent, and so on, in proportion to their several values. When this is done, no man will pay more than he ought or need, "which disproportion is the true and proper Grievance of taxes."

Whether we regard this as a formulation of the problem of justice in taxation or as an attempt at the comprehensive solution of that problem, it is entitled to high praise. Not before Adam Smith, perhaps, can another discussion of the subject be found so thorough and so well balanced as is Petty's(27*)

Out of his discussion of taxes proceeds his treatment of rent, the "mysterious nature" of which he thinks it well to explain before talking too much about its taxation. There have been intimations that Petty held a "correct" theory of rent.(28*) It is well, therefore, to see just what his theory is. It is, first of all, a theory of agricultural rent. Accordingly, he distinguishes between "the natural and genuine Rent of Lands"(29*) and their rent in gold or silver, between the "corn rent" and "money rent." The corn rent of agricultural lands, he says, is determined by the excess of their produce over the expenses of their cultivation, those expenses being paid in corn. And the value of this excess, or the money rent, is measured by the amount of silver that a man working a free mine for the same period as the cultivator of the corn land will have left after meeting his expenses with a portion of the silver that he has secured.(30*)

Passing over, for the moment, Petty's use of the labor theory of value to explain the equivalence of corn and money rents, let us turn attention to his account of the origin of corn rent. As quoted in the foot-note, it sounds rather imposing and even somewhat Ricardian. But upon examination it is seen to be merely a graphic way of saying that the rent of a farm must be paid out of the excess of its crops over the cost of producing them. That is all the Ricardianism there is in it. If Petty had been, as he was not, the first to make this assertion,(31*) his priority would have been due solely to his predecessors' contempt for commonplace. Merely to note that there must be a surplus before rent can be paid, advances the discussion no whit beyond the experience of every man who has contracted to pay rent. Granted the surplus, nothing is plainer than that the cultivator would retain it if he could. "It is," as Ricardo remarks, "one thing to be able to bear a high rent, and another thing actually to pay it."(32*) What needs to be explained is not how the cultivator can pay rent, but why he must. Adam Smith observed that, "as soon as the land becomes private property, the landlord demands a share of almost all the produce." But he did not explain why the cultivator accedes to this unwelcome demand, and his explanation of rent was incomplete in consequence. The so-called Ricardian theory of rent supplies this gap by means of the Law of Diminishing Returns. Any theory which does not contain this is something less than Ricardian.

There was probably nothing to suggest diminishing returns to Petty. Mr. Cannan has shown(33*) how the notion that additional supplies of food must be secured at increased cost was a natural conclusion from the conditions that preceded and indeed evoked Malthus's *Inquiry into the Nature and Progress of Rent*. In Petty's time, circumstances were quite otherwise. The year in which he wrote, to be sure, was a time of dearth approaching famine.(34*) But no such extreme and continued rise of prices as occurred between 1790 and 1815 had taken place within his recollection. Moreover, his warm friend, Hartlib, had published a book professing to show that by the use of agricultural methods prevailing in Brabant and Flanders all sorts of crops might be enormously increased in England.(35*) Petty was by temperament inclined to experiment and to improve. He probably knew, as every land-owner must, that it "don't pay" to spend more than a limited amount per acre on a barley field. But he never looked upon society, as Ricardo was prone to do, as a clock destined to run down by the exhaustion of its stored-up force(36*) If he wanted to use more money to advantage on his patch, he would have tried "Flax,. Turnips, Clover grass, Madder, etc.," "so as to advance in value from one to an Hundred," as Hartlib advised.(37*) He doubtless believed,(38*) just as Hume(39*) did, that with social progress a smaller portion of the community would suffice to raise food for the whole. This faith, which has been hitherto abundantly justified by the facts, is, of course, not logically incompatible with that form of the law of diminishing returns which is necessary to explain Ricardian rent.(40*) But a man who has such faith is unlikely to hit upon the Ricardian formulation of the law. And Petty did not.

The device which played in Petty's theory of rent the place taken by diminishing returns in Ricardo's is clearly indicated in his calculation of the rent of the counties nearest London. "We would first at hazzard compute the materials for food and covering, which the Shires of Essex, Kent, Surrey, Middlesex and Hertford, next circumjacent to London, did *communibus annis* produce; and would

withal compute the Consumptioners of them living in the said five Shires and London. The which if I found to be more than there were Consumptioners living upon the like scope of other Land, or rather upon so much other Land as bore the like quantity of Provisions, then I say that Provisions must be dearer in the said five Shires than in the other; and within the said Shires cheaper or dearer as the way to London was more or less long, or rather more or less chargeable. For if the said five Shires did really produce as much Commodity as by all endeavour was possible; then what is wanting must be brought from afar, and that which is near advanced in price accordingly; or if the said Shires by greater labour than now is used... could be fertilized, then will the Rent be as much more advanced as the excess of encrease exceeds that of labour."(41*) The hint here given, that the rent of lands depends not upon their differing technical fertility, but upon their proximity to markets, is subsequently developed into one of the mathematical formulae whose definiteness appealed so strongly to Petty's mind. "Land of the same quantity and quality in England," he says, "is generally worth four or five times as much as in Ireland, and but one-quarter or one-third what it is worth in Holland, because England is four or five times better peopled than Ireland, and but a quarter as well as Holland."(42*)

Bearing in mind that, according to Petty's view of the matter, - a view shared by seventeenth century economists generally, - rent is a criterion of prosperity and its rise the surest sign of growing wealth, we can see how his theory that high rents were directly due to dense populations explains his advocacy of wholesale schemes of "transplantation" in order to increase the wealth and power of the State. Thus, protesting that the suggestion is but "a jocular and perhaps ridiculous digression, which I desire men to look upon rather as a Dream or Reavery than a rational proposition," he calculates in the Political Arithmetick that, if the people of Ireland and the Highlands of Scotland were all transplanted to England, the resultant rise in rents and in year's purchase would so enrich that kingdom that it could afford to buy the lands and fixtures of its neighbors and to pay the expense of importing their persons and movables. The same idea he elaborated in great detail in the Treatise of Ireland, and he seriously attempted to secure for it the approbation of James II. As a practical proposal, it is preposterous; and the king of course refused to entertain it. But we must consider the circumstances. In the first place, Petty was familiar from his Irish experiences with the idea of deporting a whole population. He doubtless argued that, if a usurper for a mere political reason might transplant all the Irish beyond the Shannon, surely a true king might remove them to England, where, after all, they would be better off than in Connaught, while at the same time they would make his the richest kingdom in Europe. The seventeenth century was less careful of the individual's rights than the nineteenth. In the second place the economics of Petty's proposal are altogether sound. People are wealth. They are, indeed, the chief component of the national capital. The people of Ireland are capital badly situated. Their efficiency will be increased by transplanting them, just as the efficiency of a factory might be by removing it to a better site. The idea is inconsiderate; but, granting Petty's premises, it is by no means absurd.

Petty's theory of value, like his theory of rent, is developed incidentally to the discussion of taxation. It is an uncompromising quantity-of-labor theory. "Let a hundred men work ten years upon Corn, and the same number of men, the same time, upon Silver; I say that the neat proceed of the silver is the price of the whole neat proceed of the Corn, and like parts of one the price of like parts of the other... And this also is the way of pitching the true proportion between the values of Gold and Silver, which many times is set but by popular errour... This I say to be the foundation of equallizing and ballancing of values; yet in the superstructures and practices hereupon, I confess there is much variety and intricacy; of which hereafter."(43*) The promise in these last words is kept by numerous incidental remarks scattered throughout his writings, pointing out how the superstructure differs from what the foundation would lead us to expect, or, in modern language which scarcely misrepresents Petty's idea, how market price differs from the normal price of his theory. He says, for example, that "forasmuch as almost all Commodities have their Substitutes or Suecedanea, and that almost all uses may be answered several wayes; and for that novelty, surprize, example of Superiours, and opinion of unexaminable defects do adde or take away from the price of things, we must adde these contingent Causes to the permanent Causes abovementioned, in the judicious foresight and computation whereof lies the excellency of a Merchant."(44*) Compared with anything that preceded it in England,(45*) this analysis marks a great theoretical progress. It cuts loose altogether from the mediaeval notion, current at least as late as Hales' *Discourse of the Common Weal*,(46*) that price is arbitrarily determined by the seller, whose exactions must be persistently checked by law. It at least suggests the difference between normal and market price. It clearly enunciates the theory of

normal price that dominated economic thought for more than two hundred years, and bids fair to occupy once more the superior, if no longer the only, seat upon the throne. By combining it as a theory of natural price with Locke's supply-and-demand explanation of value as a theory of market price, it became possible to construct, as, perhaps, without conscious dependence upon Petty, or even upon Locke, Adam Smith did eventually construct, a theory of value so satisfactory that, when amended in some minor prints, John Stuart Mill could pronounce it "complete." Of course, it was not as complete as Mill thought it; but the contribution of its characteristic element is no mean achievement.

IV.

The second group of Petty's pamphlets, comprising the *Political Anatomy of Ireland* (1672) and the *Political Arithmetick* (1676), is predominantly descriptive. As might be expected from the specific circumstances which gave rise to the *Political Anatomy of Ireland*, its chief value springs from its author's unrivalled acquaintance with the condition of that island during the quarter-century after the Cromwellian settlement. Undeniably, the book has its blemishes. It contains some of the least admissible of Petty's calculations. It is not without numerical trivialities. But, on the whole, its merit is high. Economically, however, it merely repeats the suggestions of the earlier pamphlets, adding little or nothing new to Petty's known ideas. The *Political Arithmetick* deals chiefly with England. It, too, is in a sense descriptive. But detailed description is here consistently subordinated to a political purpose. The book is Petty's comment upon the rivalry between England and the continental nations for commercial control of the world. Of that great conflict it was his peculiar merit to take a large view. He recognized with a clearness of vision unparalleled in his time that the contest was already world-wide, and that the whole strength of Britain must be called into play. He was accordingly the first to propose the legislative union of Ireland with England,(47*) and also the earliest of imperial unionists. He saw, too, that the struggle was not a matter for one parliament or one reign. Various opponents had succeeded one another upon the continental side of the board, -- Portugal, Spain, the Netherlands. Who should close the contest he could no more foresee than we can decide to-day whether the last player against Britain shall be Russia or America. But his prescience of the immediate future was extraordinary. Earlier than any of his contemporaries(48*) he discerned that the day of the Netherlands was passed. His thesis, supported with increasing vigor from the *Treatise of Taxes*, in 1662, to the *Five Essays*, written a quarter of a century later, is that England must find her rival for the trade of the world to the south, no longer to the north, of the Scheldt. And in a contest with France, as he never tires of showing, England has all the natural advantages necessary to ultimate success.

The argument of the *Political Arithmetick* might almost be condensed, though at some risk of misrepresenting the author's temper, into the words of a not unknown verse, --

"We don't want to fight; but, by jingo, if we do,

We've got the ships, we've got the men, we've got the money, too."

"That the People and Territories of the King of England are naturally near(49*) as considerable for Wealth and Strength as those of France," that England can "mainrain a hundred thousand Foot, thirty thousand horse, and forty thousand men at sea," that there is in England "Money sufficient to drive the Trade of the Nation," and "Stock competent and convenient to drive the Trade of the whole Commercial World," -- such are the propositions to whose demonstration Petty addresses himself. His line of argument is ingenious. He first proves, by the example of Holland, that a small country and few people may, by their situation, trade, and policy, be equivalent in wealth and strength to a far greater people and territory. Examination of the geographical situation leads him to the conclusion that conveniences for shipping and water carriage do most eminently and fundamentally conduce thereunto; and he points out very shrewdly how the inferiority of France in ports, and consequently in seafaring people, constitutes a real and natural impediment to her power. Meanwhile on land the conditions are not so unequal as they seem. To be sure, "the King of England hath about Ten Million of Subjects, *ubivis Terrarum Orbis*, and the King of France about

Thirteen and ½."(50*) "Although it be very material to know the number of Subjects belonging to each Prince, yet when the Question is concerning their Wealth and Strength, It is also material to examine how many of them do get more than they spend and how many less."

This introduces a new element into the calculation of "the value of people" as we mot it in the *Treatise* and in *Verbum Sapienti*. Some individuals are not "superlucraters," and must be excluded. For example, there are twenty thousand churchmen in England, and over two hundred and seventy thousand in France. This quarter of a million of supernumerary clergymen, withdrawn out of the world, are adult and able-bodied persons, and consequently "equivalent to about double the same number of the promiscuous Mass of Mankind; . .. wherefore the said Two Hundred and Fifty Thousand Churchmen (living as they do) makes the King of Franco's Thirteen Millions and a half to be less than Thirteen."(51*) He then shows further that the King of England has forty thousand seamen, and the King of France ten thousand. "But one seaman earneth as much as three common Husbandmen; wherefore this difference in seamen addeth to the account of the King of England's Subjects an advantage equivalent to Sixty Thousand Husbandmen." Similarly, the superiority of England in artisans employed upon shipping of all sorts, who likewise earn three times as much per capita as husbandmen, adds the equivalent of eighty thousand husbandmen more. Still further, the King of England's territories are, because of their coast line and deep rivers, "in effect but 12 miles from Navigable Water, the King of Franco's 65, ... upon which grounds it is clear that England can be supplied with all gross and bulky commodities of Foreign growth and Manufacture at far cheaper rates than France can be, namely, at about 4s. per cent. cheaper, the Land carriage... being so much or thereabouts."(52*) This cannot amount to less than the labor of one million people. Thus the effective population of France is reduced from 13½ to 19. millions.

Here the argument takes a new and concluding turn: "Lastly, I offer to the consideration of all those, who have travelled through England and France; whether the Plebians of England (for they constitute the bulk of any Nation) do not spend a sixth part more than the Plebians of France? And if so, it is necessary that they must first get it; and consequently that Ten Millions of the King of England's subjects, are equivalent to Twelve of the King of France; and upon the whole matter, to Thirteen Millions, at which the French Nation was estimated."

It is not necessary to pursue the contentions of the *Political Arithmetick* further, in order to see that the impediments of the greatness of France, such as paucity of ports, are natural and perpetual, while the impediments of England's greatness, being political, are but contingent and removable. Nor shall I follow him here into the interesting discussion of the amount of money that the nation has and the amount that it needs. Enough has been brought forward to show both the extent to which Petty pushed his calculations of "the value of people," and his high estimate of their relative importance in that "Par or Equation between Lands and Labor" which he regarded as "the most important Consideration in Political Economies."(53*)

The *Essays in Political Arithmetick*, together with the *Quantulumcunque*, form the third group of Petty's writings. They are almost altogether taken up with attempts to calculate the population of various cities. Like the *Political Arithmetick* itself, they have a public purpose.

They explain to James II, who, at least in Petty's fancy, was willing, if only he could afford it, to cut loose from the dependence upon France inaugurated by his brother, that his own capital of London was a greater city than Paris, and, indeed, the greatest in the world. From this demonstration it is clear that Petty expected great results. In fact, their influence upon the royal conduct was too slight to be detected. They attracted some attention of the curious,(54*) but they failed altogether of the purpose which their author had at heart.

The present interest of the *Essays* lies chiefly in the light which they throw upon Petty's statistical method. Economically, they are barren. The *Quantulumcunque*, on the other hand, is full of meat. This little tract of eight pages is one of the least known of Petty's writings, for it was never included in the collected editions of the *Essays*; and the reprints of it(55*) are nearly, if not quite, as scarce as

the original. It takes the form of a dialogue, thirty-two questions being asked and answered about the coinage of England. It was written in August or September, 1682 when Halifax, always before his contemporaries in appreciating public needs, was already planning for the recoinage that was not carried out until 1696; and it is addressed to that far-sighted statesman. It begins by arguing that .the clipped money should be recoined. at full weight of the old standard, but at the cost of the holders, not of the State. If it were recoined at public cost, "men would clip their own Money; But the Owner himself must bear the loss, because he might have refused light and defective Money." The argument that recoinage at full weight will increase the export of coin to the damage of England is met by showing, first, that silver is exported as bullion, the number of coins to the ounce being immaterial, and, secondly, that money is exported only when the merchant can get for it abroad goods of greater value. Full weight coinage, therefore, is alone advisable; and those States that have debased their coin "are like Bankrupt Merchants, who Compound for their Debts by paying 16s. 12s. or 10s. in the pound." Interest is "a Reward for forbearing the use of your own Money for a Term of Time agreed upon, whatever need yourself may have of it in the meanwhile"; and laws limiting interest are as ill-judged as those limiting the exportation of money or the rate of exchange, " for Interest always carrieth with it an Ensurance praemium which is very casual, besides that of Forbearance." These extracts will show the quality of the pamphlet, whose published price was twopence. It was worth the money.

V.

The notion is more or less prevalent that, in his general attitude towards industrial society, Petty was somehow a forerunner of Adam Smith, a "founder of political economy." What "political economy" may mean in this connection is not altogether clear; but it is, at any rate-something which an intelligent man may be expected to "know," and it appears to culminate in the dogmatic preaching of free trade. Tried by the free-trade shibboleth, Petty has been found to merit a condescending approval. "He is one of the first in whom we find a tendency to a view of industrial phenomena which was at variance with the then dominant mercantilistic ideas." He was "generally opposed to government interference with the course of industry," and contributed in his way, as did Dudley North's "most thorough-going and emphatic assertion of the free-trade doctrine against the system of prohibitions," to lay "the foundations of a new and more rational doctrine than that of the mercantilists."(56*) Such views of Petty are due, I think, rather to the influence of Roscher (57*) than to an exhaustive examination of Petty's writings. Travers Twiss, who reviewed the development of economics only four years before Roscher, and was properly anxious to commend his countrymen by showing that they had cherished the enlightened views of Smith and Ricardo a century or more in advance, mentions Petty's writings three times;(58*) but even with the help of McCulloch he finds in them no such "able statement of the true principles of commerce" as North's *Discourses upon Trade* contained.(59*) Roscher, therefore, may be credited with originating, and Kautz(60*) with promptly adopting, the idea that Petty, North, and Locke constituted a sort of free-trade triumvirate. The grouping seem to me of doubtful propriety.

Petty is a copious and vivacious writer, abounding in comment and digression. He is primarily interested in taxation, not in trade, -- a sort of an English cameralist. When he does turn his attention to trade, we find that he has progressed far enough beyond the cruder expedients of mercantilism to condemn restrictions on the export of coin,(61*) and even to suggest that a nation may have too much money; "for Money is but the Fat of the Body politick, whereof too much doth as often hinder its Agility as too little makes it sick."(62*) At times he goes further still in his dissent from current views, and it is quite possible to cull from his pamphlets scattered passages that appear to support Roscher's classification.(63*) There are, for example, several remarks about the Laws of Nature(64*) which read almost as if he shared that belief in a pre-established harmony of interests which, in the case of Adam Smith, reduced the free-trade proposition to the rank of a mere corollary. But it would be a mistake to consider such passing remarks as indices of Petty's true position. Not only can each specific condemnation of some restriction upon trade be offset by a specific commendation of some other restriction, but, what is far more important, it is clear also that to represent Petty as an advocate of laissez-faire on principle is altogether to misrepresent him. On the contrary, he not only assumed, like the political disciple of Hobbes that he was, that the government is justified in doing anything whereby the national wealth will be increased, but he was unwearying in devising schemes, sometimes legislative, sometimes administrative, for that end.

Some of his schemes are little short of fantastic.(65*) Many of them evince an entire disregard for the wishes and interests of individuals. In short, if we understand mercantilism to consist, broadly speaking, in a tendency to force the transition from local to national economic coherence by means of governmental interference with the activities of individuals in business, then Petty was one of the most extreme among English mercantilists.

NOTES:

1. The original pamphlets have become scarce. They are reprinted in *The Economic Writings of Sir William Petty*, together with the *Observations upon the Bills of Mortality*, more probably by Captain John Graunt. Edited by C. H. Hull. Cambridge: at the University Press. 1899. 2 vols., 8vo.

2. *Zur Theorie des Preises, mit besonderer Berücksichtiaung der geschichtlichen Entwickdung der Lehre*, 1889.

3. Geschichte der nationalökonomischen Krisentheorieen. 1895.

4. So called because "set down upon maps."

5. On the biographies of Petty see note in *Economic Writings*, i. xiii.

6. Evelyn's *Diary*, March 22, 1675.

7. The *Quantulumcunque concerning Money*,.which probably belongs, as to provocation, subject, and characteristics, in a class by itself.

8. See the discussion of the disputed authorship in Petty's *Writings*, i. xxxlx-liv, or in *Political Science Quarterly*, xi. 105-132. In *Literature*, 11 November, 1899, p. 468, it is suggested that the varying employment of "I ' and "my," "we" and "ours," in the *Observations* might have been used to discriminate the portions that are by Graunt alone from those in which he had Petty's assistance. The acceptance of this test would show in many cases that parts of the same paragraph, in some eases that parts of the same sentence, had different authorship. English syntax was looser two hundred years ago than now.

9. *Writings*, ii. 481.

10. Preface to Political Arithmetick, *Writings*, i. 244.

11. *Writings*, i, 53, cf. 49, 51, 104, 115, 127, 120, 180, 245; ii. 476, 485,

12. The London bills of mortality am discussed historically and critically in the introduction to Petty's *Writings*, i. lxxx-xci.

13. *Writings*, ii 332, 393.

14. Vol. ii. 527, 534.

15. Vol. ii. 459.

16. Vol. ii. 461, cf. i. p. xxxi.

17. Italics in the original.

18. "By laborious Conjectures and Calculations to deduce the number of People from the Births and Burials, may be ingenious, but very preposterous." *Observations on the Dublin Bills*, 7; *Writings*, i. 485.

19. Cf. J. Grätzer, E. Halley und Gaspar Neumann, 1883.

20. *Physico-theology*. By W. Derham. London, 1713. I use the 1798 edition, vol. i. p. 267.

21. John is far more appreciative of Graunt than the others.

22. *Discourses on the Public Revenues*, 1698, in Davenant's *Works*, i. 128.

23. *Writings*, i. 91.

24. Graunt had calculated the population of England in 1662 at 6,440,000. In 1687 Petty thought it

to be 7,369,009, as previously noted. See p. 317. In the *Pohtical Arithmetick* Petty returned to the question of average expenditure, and then (1676) gave some reasons for thinking that £7 per annum "may well enough stand for the Standard of Expense of the whole mass of Mankind" in

England. *Writings*, i. 306.

25. *Writings*, i. 108.

26. Cf. *Political Arithmetick*, 31, 32; *Writings*, i. 267. This ingenious calculation has been brought down to date by Professor J. S. Nicholson, "The Living Capital of the United Kingdom," in *Economic Journal*, i. 95 (1891).

27. Certainly nothing to compare with it has been discovered by the researches of F. J. Neumann ("Die Steuer nach der Steuerfähigkeit," in Conrad's *Jahrbücher* (1880), xxxv. 511-578), Robert Meyer (*Die gerechte Besteuerung* (1884), 3-21), Hasbach ("Die Entwickelung der Finanzwissenschaft bis auf Adam Smith," in his *Untersuchungen über Adam Smith* (1891), 240-290), or Ricca-Salerno (*Storia delle dottrine finanziarie* (1896), 148-210).

28. E.g., McCulloch's *Literature of Political Economy*, s. v., Ingram's *History of Political Economy*, p. 57. Dr. Bevan goes so far as to say (*Sir William Petty: A Study*, 98) that Petty "would quite agree with Ricardo's definition of rent as the payment for indestructible powers of the soil"!

29. *Political Anatomy of Ireland*, 54; *Writings*, i. 174.

30. "Suppose a man could with his own hands plant a certain scope of Land with Corn, that is, could Digg, or Plough, Harrow, Weed, Reap, Carry home, Thresh and Winnow so much as the Husbandry of this Land requires; and had withal Seed wherewith to sowe the same. I say, that when this man hath subducted his seed out of the proceed of his Harvest, and also, what he himself hath both eaten and given to others in exchange for clothes, and other Natural necessaries; that the remainder of corn is the natural and true Rent of the Land for that year; and the medium of seven years, or rather of so many years as makes up the Cycle, within which Dearths and Plenties make their revolutions, doth give the ordinary Rent of the Land in corn.

"But a further, though collaterall question may be, how much English money this Corn or Rent is worth? I answer, so much as the money which another single man can save within the same time, over and above his expense, if he imployed himself wholly to produce and make it; viz., Let another man go travel into a Country where there is Silver, there Dig it, Refine it, bring it to the same place where the other man planted his Corn, Coyne it, &c. the same person, all the while of his working for Silver, gathering also food for his necessary livelihood, and procuring himself covering etc. I say the Silver of the one must be esteemed of equal value with the Corn of the other." *Treatise of Taxes*, 24-25; *Writings*, i. 43.

31. See, for example, Hales' *Discourse*, 38.

32. Chapter on "Mr. Malthus's Opinions on Rent" in Ricardo's Principles, p. 559 of 1817 edition.

33. "The Origin of the Law of Diminishing Returns," in *Economic Journal*, March, 1892, ii. 53-69, also in his *Theories of Production and Distribution* (1894), 147-168.

34. Rogers's *History of Agriculture and Prices*, v. 213-215.

35. *Legacie of Husbandry*, 1655

36. I cannot recall whether this comparison was suggested by Mr. Cannan or by Dr. Patten.

37. *Political Arithmetick*, 2, 4; *Writings*, i. 249-251.

38. Ibid., 33; loc. cit., 267.

39. "Essay of Commerce," *Philosophical Works* (1854), iii. 280.

40. Cf. Commons, *Distribution of Wealth*, 116-159; Clark in Palgrave's *Dictionary*, i. 602 a.

41. *Treatise of Taxes*, 33; *Writings*, i, 51, 52. In another part of the same tract (p. 30; *Writings*, i, 48, 49) he says: If the Core which feedeth London or an Army be brought forty miles thither, then the Corn growing within a mile of London, or the quarters of such Army, shall have added unto its natural price, so much as the charge of bringing it thirty-nine miles doth amount unto. ... Hence it comes to pass that Lands intrinsically alike near populous places, such as where the perimeter of the Area that feeds them is great, will not only yield more Rent for these Reasons, but also more years purchase then in remote places, by reason of the pleasure and honour extraordinary of having

lands there; for Omne tulit punctum qui miscuit utile dulci."

42. *Political Arithmetick*, 67; *Writings*, i, 286.

43. *Writings*, i. 43, 44, *Treatise of Taxes*.

44. *Writings*, i. 90, *Treatise of Taxes*.

45. I have only a second-hand acquaintance with the early Italian theories of value, based on Graziani's *Stocria critica della teoria del valere in Italia* (1889).

46. Lamond's edition, 4,2, 43.

47. Writings, i. 159-161, 219-221 (*Political Anatomy*), 298-301 (*Political Arithmatick*). Cf., T. D. Ingram's *History of the Legislative Union*, 11, ft.; Ball's *Historical Review of the Legislative Systems in Ireland*, 72. The *Political Anatomy* was written five years before [Thomas Sheridan's] *Discourse of the Rise and Power of Parliaments*, and was published seven years before Molyneaux's *Case of Ireland being Bound*.

48. The much-experienced Sir William Temple might appear to be an exception. Temple's *Observations upon the United Provinces*, published in 1673, does indeed contain a chapter on "The Causes of their Fall in 1672." But Temple was impressed merely by the disasters of the Dutch at the beginning of that shameful war, and the causes that he assigns are chiefly that military unpreparedness and that lack of united martial spirit which the event showed to be less than he supposed. Of the underlying and more permanent reasons why Holland must give way to France, and France to England, Temple showed little comprehension.

49. "Near" was, as the British Museum MS. of the *Political Arithmetick* shows, a concession to caution. It did not appear in the fair copy made by an amanuensis, but was afterwards inserted by Petty's hand. See *Writings*, i. 284.

50. *Political Arithmetick*, 76, 77; *Writings*, i. 291.

51. This argument quite harmonizes with Petty's highly-developed theory of productive and unproductive labor.

52. Petty had conducted elaborate experiments to determine the cost of land carriage with different vehicles.

53. *Writings*, i. 181; *Political Anatomy of Ireland*, chap. ix. This is, no doubt, the passage which Cantillon found "dans un petit Manuscrit de l'année 1685 [1672] " by Petty. But we may not conclude that Canttillon's eleventh chapter, or indeed any part of his argument, was consciously influenced by Petty's remarks, for he declares that "Is recherche qu'il en a fair, en passant, n'est bisarre & éloignée des regles de la nature, que parcequ'il ne s'est pas attaché aux causes & aux principes, male seulement aux effets." *Essai sur le Commerce*, p. 54.

54. See *Journal des sçavans*, 15 Mars, 1683, Bayle's *Nouvelles de la république des lettres*, October, 1686, and the Leipzig *Acta Eruditerum*, October, 1687.

55. In Massie's *Observations relating to the Coin*, 1760, and in A *Select Collection of*

Scarce and Valuable Tracts on Money from the Originals of Vaughan, Cotton, Petty, Lowrides, Newton, Prior, Harris, and Others. *With a preface (by J. R. McCulloch), notes, and index*. London: Printed for the Political Economy Club, 1856.

56. J. K. Ingram on Petty, *Encyclopaedia Britannica*, xix. 358 (1885); also, Ingram's *History of Political Economy*, 47-53, reprinted from *Encyclopaedia Britannica*.

57. *Zur Geschichte der englischen Volkswirthschaftslehre im 16. und 17. Jahrhundert*, Leipzig, 1851, in Abhandlungen der k. sächs. Gesdlschaft der Wissenschaften, 3er Bd.

58. *View of the Progress of Political Economy since the Sixteenth Century* (1847) pp. 64, 87, 164.

59. Ibid., 83.

60. Die geschichtliche Entwickdung der Nationalekonomie (1860), § 46: "Dis anti-merkantilistische Richtung und die Anfänge der wissonschaftlicheren Nationalökonomie in England," pp. 308-317.

61. *Writings*, i. 57, 58, 87; ii. 440, 445, 446.

62. Vol. ii. 113.

63. Cf. especially chap. vi. of the *Treatise of Taxes*; *Writings*, i. 54-61.

64. Vol. i. 9, 48, 243; il. 445; cf. i. 60.

65. E.g., the plan to reduce Ireland to a cattle ranch by deporting three-fourths of the Irish to England. *Treatise of Ireland*, *Writings*, ii. 545-621.