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CONTENTS

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

COMPARATIVE MEASUREMENTS OF THE CHANGING COST OF LIVING[1]

THE changing cost of living is a fundamental cause of many reactions in the complexes of social phenomena. In fact, it is probable that an economic interpretation of many important historical movements may be developed from future study of such events as possible effects of this probable fundamental cause of radical movements in human societies, such as extensive revolutions and even international wars.

Political economists, at any rate, should hold always before them the idea that mankind is subject first to the primary economic problems of self-maintenance. The changing cost of living is another phrase to denote in a civilized society this factor of relative self-maintenance which is so important in the study of the more primitive societies. Thus, on the side of the consumption of commodities, we may measure the changing cost of the primary necessities in terms of the prices of the markets.

With the development of markets and with the establishing of standard grades for leading commodities, it becomes possible to fix rather definitely comparative prices of all of the more important commodities. As a result, we may compare with a considerable degree of accuracy the fluctuations in the changing cost of living over a series of successive years. Of course, the greater problem of constructing an index number of relative welfare which shall

[1] Address of the vice-president and chairman of Section I, American Association for the Advancement of Science, Cleveland, January 3, 1913.

combine in some rational way the general concepts of the cost of living and of the average rates of income may lead eventually to many interesting conclusions, but this problem at the present time is extremely difficult.

In this paper, which is divided into three parts, I shall present, first, the results of original computations of two series of index numbers for American prices. Hitherto, the purpose of index numbers has been chiefly to measure the changing cost of living in order to compare the relative conditions of successive years for the same country.

In the second part of this paper, I have endeavored to present some comparative measurements of the changing cost of living for various countries at the same time, and, incidentally, to devise an international index number, based on some index numbers of the United States, England and France. In the third part, it is interesting to consider briefly various remedies for the instability of the price level, and to inquire whether a society has not within its control indirect methods of reducing absolutely the cost of living—methods which may prove more fruitful than some of the direct methods which have been suggested from time to time in order to secure a relative rather than an absolute reduction.

It is unnecessary to present a technical description of my two series of index numbers for American prices which have been described in the *Quarterly Journal of Economics*,[2] and elsewhere.[3] Suffice it to state that the general method of the Sauerbeck system has been adopted along with certain modifications, some of which were suggested by Forbes and others occurred as practical necessities of the computation.

[2] *Quarterly Journal of Economics*, August, 1910.

[3] Pamphlets on Index Numbers, published by the Gibson Publishing Co., 1910–11.

The two index numbers may be described as the averages of the percentages of the prices of fifty important commodities expressed in terms of the average prices of the years, 1890 to 1899, so that the average price level of the years 1890 to 1899 is the base or one hundred per cent. Two systems of weighting have been used. My first series follows Sauerbeck in the use of the simple arithmetical average. The second series was intended as an approximate continuation of the Dun index numbers which ended in 1907, and which have been published since 1910 as the Gibson index number. The same arbitrary weighting is used in the two series, although the Dun numbers were based on three hundred and fifty commodities and the Gibson on fifty leading commodities. Mitchell[4] has shown that my method of continuing the Dun numbers by using fifty primary commodities rather than three hundred and fifty commodities, many of which are derivative, produces an average difference on the basis of past years approximately of two per cent. The fifty commodities consist of the leading articles of commerce which are most capable of accurate grading.

In the succeeding table,[5] the relative weighting of the various groups, such as foods, clothing, minerals and other commodities, is presented in contrast for various index numbers, in order to suggest the cause of the slight differences which occur in the results reached by the various numbers.

The more heavily the food group is weighted, the more the total index number of all commodities tends to advance. This

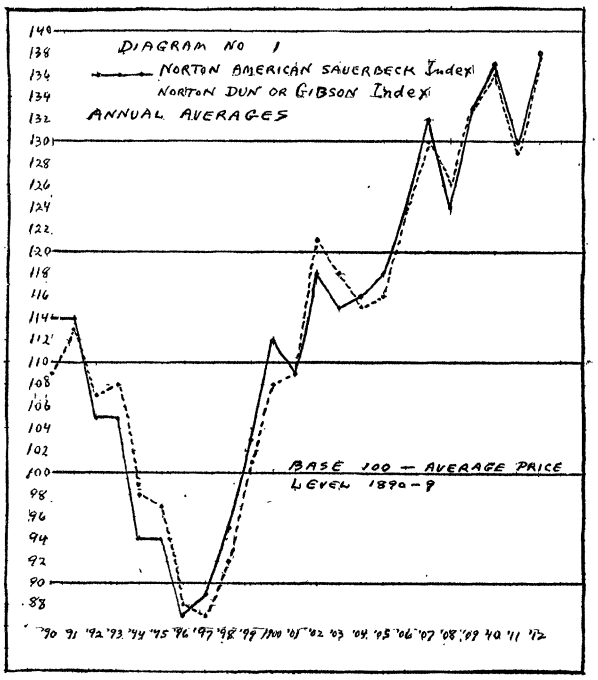
[4] *Quarterly Journal of Economics*, November, 1910.

[5] "How Index Numbers are Made," by F. C. Croxton, *Journal of Commerce*, June 2, 1910, and Norton, "Weighting of Index Numbers," June 9, 1910.

TABLE SHOWING WEIGHTING OF GROUPS IN VARIOUS INDEX NUMBERS

Groups of Commodities	Sauerbeck's English Index Number, Per Cent.	Norton's American Sauerbeck Number, Per Cent.	Norton's Gibson or Dun Number, Per Cent.	Bradstreet's Index Number, Per Cent.	Bureau of Labor Index Number, Per Cent.
Clothing..	42	44	50	37	26
Food.....	18	18	18	10	29
Other.....	40	38	32	53	45

number,[6] the second column the Dun and Gibson series, and the third column the Dun and Gibson series reduced to the same base as the American Sauerbeck which is the average price level of the years 1890 to 1899 as one hundred per cent. This table is represented graphically by diagram No. 1.



point will be discussed later in this paper. On the other hand, if a large weight is given to manufactured articles, which is the case in the United States Bureau of Labor index numbers, the tendency is to reduce the extent of advance. The group weighting influences the results more than the fluctuations of single commodities, because all commodities of the food group are in a large measure in competition through possible substitution by consumers. The following tables, which are represented by diagrams, disclose the annual averages for the period, 1890 to 1912. The first column contains the American Sauerbeck index

The annual average difference of the two index numbers is two per cent.

To summarize the general movements, a five year average table has been prepared. This table shows how little the weighting has influenced the results in the two series, because the weighting for the food group differs in the two numbers to a less extent than in the case of the other possible comparisons.

[6] Norton's "Lessons Suggested by the Experience of the French People and of the Bank of France," *Proceedings of the Academy of Political Science*, January, 1911.

TABLE OF ANNUAL AVERAGES OF TWO INDEX NUMBERS FOR AMERICAN PRICES

	American Sauerbeck Index Number	Dun or Gibson Index Number	Percentage Dun Index Number
1890	114	92	109
1891	114	96	113
1892	105	90	107
1893	105	91	108
1894	94	83	98
1895	94	82	97
1896	87	74	88
1897	89	73	87
1898	95	78	92
1899	103	85	101
1900	112	91	108
1901	109	92	109
1902	118	102	121
1903	115	100	118
1904	116	97	115
1905	118	98	116
1906	124	105	124
1907	132	110	130
1908	124	106	126
1909	133	112	133
1910	137	115	136
1911	130	109	129
1912	138	117	138

TABLE SHOWING THE FLUCTUATIONS OF THE FIVE-YEAR AVERAGES OF THE TWO INDEX NUMBERS FOR AMERICAN PRICES

	Dun-Gibson	Norton-Sauerbeck
1890–94	107	106
	—14	—12
1895–99	93	94
	+21	+20
1900–04	114	114
	+12	+12
1905–09	126	126
	+ 8	+ 9
1910–12	134	135

It is clear that both series of index numbers agree rather closely in showing that we have been living in an era of a prolonged advance in the cost of living during the past fifteen years. In summary, using my American Sauerbeck index numbers, the price level of 1912 is some 59 per cent. above the level of 1896, and compared with 1890, the percentage of advance is 21 per cent.

Such instability in the average price level is unfortunate, and, whether we attribute the causes solely to forces acting on commodities or to fluctuations in the gold standard or to both causes, the central fact remains that the instability of the price level has caused many hardships to our people.

Let us now construct two index numbers by splitting up the component groups into a food index number and an "other than food" index number, using the average prices of each group, respectively, as the two bases, one hundred per cent. The purpose is to discover the relative movements of the two groups, foods and other than foods, over a period of fifty years. Using the early Dun numbers, reduced to the new percentages, we may present a rough comparison, which, I think, throws light on the situation.

What has happened becomes obvious upon inspecting the following table, which presents the conditions of the price levels of the two groups for selected years, during the period commencing in 1860 and ending in 1912.

TABLE SHOWING THE FLUCTUATIONS OF THE FOOD INDEX IN CONTRAST WITH THE INDEX FOR OTHER COMMODITIES FOR SELECTED YEARS. 1860 TO 1912

	Index Number for Foods	Index Number for Commodities Other than Foods
1860	145	155
1864	293	452
1870	195	200
1875	167	160
1880	138	155
1885	117	112
1888	126	112
1889	124	112

The above statistics are as of January 1.

1890	102	117
1891	121	107
1892	107	107
1893	110	107
1894	102	95
1895	100	95
1896	81	95

1897	83	88
1898	93	93
1899	100	102
1900	105	112
1901	105	114
1902	126	117
1903	117	119
1904	105	112
1905	112	121
1906	119	131

The above statistics are as of July 1.

1907	121	140
1908	129	124
1909	140	126
1910	140	133
1911	136	124

The above statistics are annual averages.

1912	148	131

The figure for July, 1912, is given as the last comparison.

From the average of the low years, 1896–1897 down to 1912, the food group has advanced 80 per cent. and the "other than food" group 43 per cent. Thus, compared with the two low years, 1896–97, foods have advanced nearly twice as much as other commodities. Consequently, the hardships experienced by the classes of the smaller incomes have been very great throughout the world, inasmuch as in all family budgets the percentage spent for foods increases as income diminishes.

But, if we take as representative the figures of 1860 and 1880, leaving out of account the years of the Civil War and of suspension of specie payments, we have 142 for foods and 155 for other commodities. Comparing the conditions of the years 1860 and 1880 with the low years 1896–97, we might have said in 1896 and 1897 that foods had fallen 60 points and other commodities 63 points, or turning the comparison about, food prices as well as other commodities in 1860 and in 1880 were approximately 70 per cent. higher in 1860 and in 1880 than in 1896–97. In short, food prices are now on the level of 1860 and 1880 and other than food prices are probably 15 per cent. lower.

In summary, since food prices during the past fifteen years have advanced in the United States nearly twice as much as the "other than" food commodities, it is unlikely that the tariff has played so important a part as other causes. Possibly, the tariff is indirectly responsible to some extent in over-stimulating industries of the "other than food" group, and in this way helps to contribute to a deficit proportion of agricultural population.

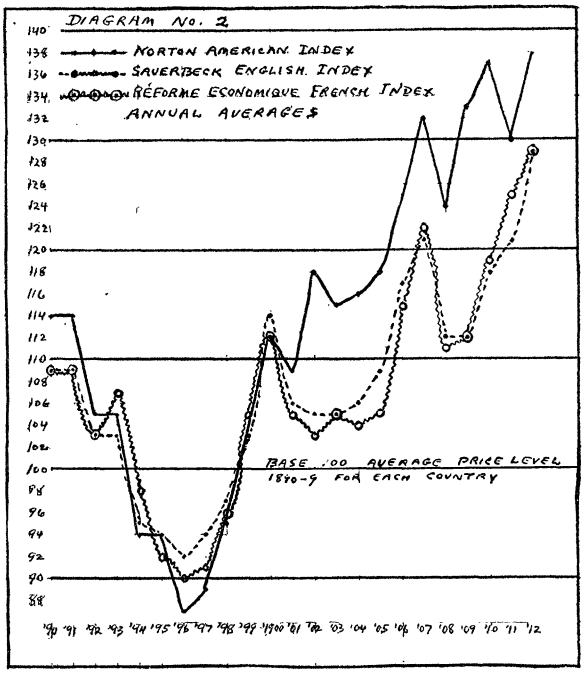
It seems more probable, however, that the great drop in prices which occurred from 1880 to 1896 represents in part the effects of the unprecedented railroad construction of those days and of the utilization of new inventions in farm machinery, two causes which were at work and must have cheapened the average cost of production of the food group. Naturally, rural population was displaced by farm machinery and we know that thousands of acres of farm lands in the east were rendered of less value by the falling prices, resulting from the application of these two great lines of inventions. As food prices fell and immigration continued on a large scale the wage rates fell, and reduced wages made the cost of production of other commodities lower and naturally the prices went down in sympathy with the lower cost of production.

Food prices are fundamental and "other than food" commodities are derivative through the wage scales which vary with the cost of food. Further, all statistics indicate a steady drift of population away from the food industries to the "other than" food industries, suggesting that the opportunity to secure steady work by labor less securely attached to land has been better in the "other than food industries."

The various movements to extend agricultural credit, to improve systems of distribution and to furnish instruction to the agricultural classes are doubtless in the right direction. But, it is difficult to see how these movements, beneficial as they may prove, can much more than keep pace with similar movements making urban work more productive, such as rapid transportation, trade schools, night schools, etc. In fact, the simple economic force to increase the relative production of foods is, after all, a continued higher level of food prices which will tend to raise farm wages and to stimulate increased production generally in all of the land pursuits.

In order to make comparisons, Sauerbeck's index number for England and the index number[7] for France are reduced to percentages of their own averages for the years, 1890–99, respectively. Thus, the three numbers for each year are simply percentages of the average price level of the decade, 1890–99, for each of the countries. Diagram No. 2 represents the fluctuations of the index numbers of the three countries.

This method affords a system of comparative measurements of the changing cost of living for different countries, but does not necessarily afford a basis for the measurement of the absolute cost of living in different countries. The latter is, also, an important problem which should be undertaken, the solution of which will require patient critical work in the determination of equal grades of commodities in various countries.



We come now to the second part of this paper, the comparative measurements of the changing cost of living, geographically considered. In the following table, illustrated by diagram, we may contrast the changing cost of living in the United States, England and France.

[7] Published monthly by *La Réforme Economique.*

The fourth column contains the records of my international index number which is simply the average of the three preceding numbers for each year. It is interesting to note that American prices, commencing in 1902, advanced much more rapidly than did the price levels of foreign countries, but in the years 1911 and 1912 the margin of difference was considerably reduced.

TABLE SHOWING INDEX NUMBERS OF THE UNITED STATES, ENGLAND AND FRANCE

	United States Norton Sauerbeck	England Sauerbeck	France Reforme Economique	Norton International
1890	114	109	109	111
1891	114	109	109	111
1892	105	103	103	104
1893	105	103	107	105
1894	94	95	98	96
1895	94	94	92	93
1896	87	92	90	90
1897	89	94	91	91
1898	95	97	96	96
1899	103	103	105	104
1900	112	114	112	113
1901	109	106	105	107
1902	118	105	103	109
1903	115	105	105	108
1904	116	106	104	109
1905	118	109	105	111
1906	124	117	115	119
1907	132	121	122	125
1908	124	112	111	116
1909	133	112	112	119
1910	137	118	119	125
1911	130	121	125	125
1912	138[8]	129[8]	129[8]	132[8]

We are led by our system of comparative measurements of the changing cost of living to the conclusion that world-wide causes are primarily responsible for the prolonged advance in the cost of living. It is probable that accurate statistics would show for India, China, the Argentine, in fact for all countries of the world which are connected by commercial relations, quite similar conditions. My international index number for 1912 shows an advance of 46 per cent. over the low year 1896, in comparison with 59 per cent. for the United States, 40 per cent. for England and 43 per cent. for France. It should be noted that the United States numbers have advanced considerably more than the index numbers of foreign countries. But we should remember that commodities "other than" food advanced 49 per cent. in the United States, which is on a parity with the advances of all commodities for England and France.

[8] Average based on first ten months.

TABLE AFFORDING COMPARISONS OF 1896 AND 1912, AND 1880 AND 1912

	Advance 1896-1912, Per Cent.	Advance 1880-1912, Per Cent.
United States, foods	83	7
United States, other than foods	49	—15
United States, all groups	59	— 6
England, all groups	40	— 3
France, all groups	43	

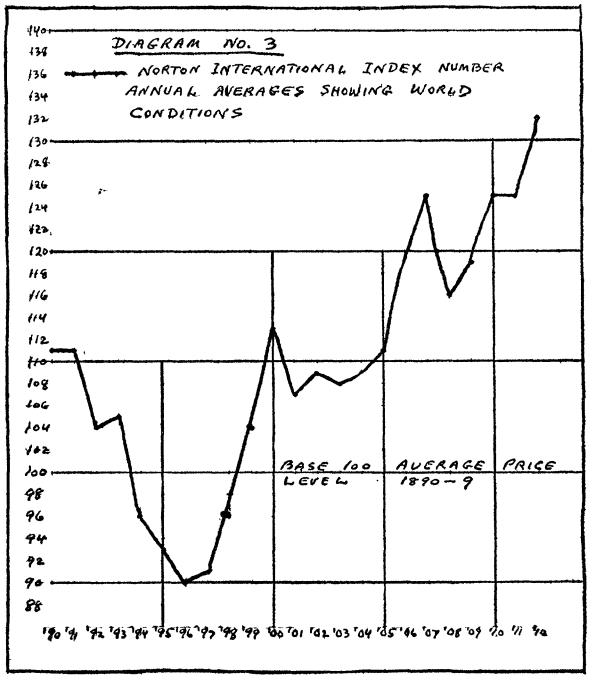
The extraordinary advance occurs in the food group of the United States, and it is quite possible that this represents several causes, some of which are technical, some of which are national and some are connected with the chain of sequences produced by an increasing production of gold. It is plain that international causes are at work. During sixteen years following 1880, world prices fell, and during sixteen years following 1896, world prices rose. It is interesting to note that independent computations show that after thirty-two years prices in the United States and in England have recovered very nearly the entire amount of the decline which reached the low point in 1896, and that now world prices are upon an approximate parity with those of 1880.

An excellent opportunity is afforded the recently appointed Industrial Commission to determine the rates of wages prevailing

in 1912 in comparison with 1880, because the cost of living conditions in the two years are very much alike and the years are far enough apart in time to furnish an excellent basis for sound conclusions regarding the relative rates of income of all classes of labor. The results would probably surprise those economists who distrust the possibilities of social progress.

finally recommended this plan to congress. Endorsements have been given by resolutions of the New York Chamber of Commerce and more recently by the International Congress of Chambers of Commerce of the world. The Sulzer bill, providing for such a commission, is now before congress.

The work of such an international com-



In 1907, the writer proposed the appointment of an international commission[9] to study the causes of the advancing price level, believing international causes were chiefly responsible. In 1912, as a result of the Washington meetings, when Senator Burton, vice-president of the American Association for the Advancement of Science, read a paper on the causes of the high prices and Professor Irving Fisher spoke before the American Economic Association in favor of the proposition, President Taft

[9] *Yale Review*, 1906, and *Moody's Magazine*, 1907.

mission on the cost of living might well include the computation of a series of identical numbers for the principal countries of the world. Such index numbers should disclose the absolute as well as the relative changing cost of living as measured by fifty to one hundred leading commodities, by providing for identical commodities, identical grades and identical weighting. Such an investigation is quite as proper for the Carnegie Institution or for the United States Bureau of Standards to undertake, inasmuch as such measurements of price levels are not only very central,

but also pressing problems of economic research.

If a complete and thorough investigation should be undertaken to show the relations of the price movements of the principal countries, it is probable that the composite result expressed in the form of an international index number would not differ greatly from my international index number in statistical significance. The international index number is represented by diagram No. 3.

What would this result mean? I think that we should have in a well-defined form an approximation to those two concepts concerning which Jevons wrote, namely, first, an international multiple standard of value, and, second, a method of achieving the use of international money by making the present currency of all nations token money under the new standard of value.

Since we hold that the evidence shows that international causes are largely responsible for the advance in prices, we may omit consideration of many of the remedies which have been proposed from time to time which, if applied, would be essentially local in their operation.

What are the international causes which could have produced this common rise of more than forty per cent. since 1896 in three countries, and what could have been the common international causes for the fall in prices of the period, 1860–1896? The writer believes that the international causes are three in number. First, cheaper transportation was responsible for a part of the decline, 1880–1896, and the cessation of railroad building on a large scale coupled with increasing consumption resulted in the recovery following 1896 in some part. Second, extensive use of farm machinery lowered the cost of production throughout the world and the use of labor-saving machinery on farms resulted in a relative displacement of farm labor, causing the relative exodus from the agricultural occupations. This caused a part of the decline in food prices down to 1896. This table of averages of food prices in comparison with the prices of other commodities indicates what have been the changes in the two groups by five-year periods. Diagram No. 4 discloses the trend of these averages.

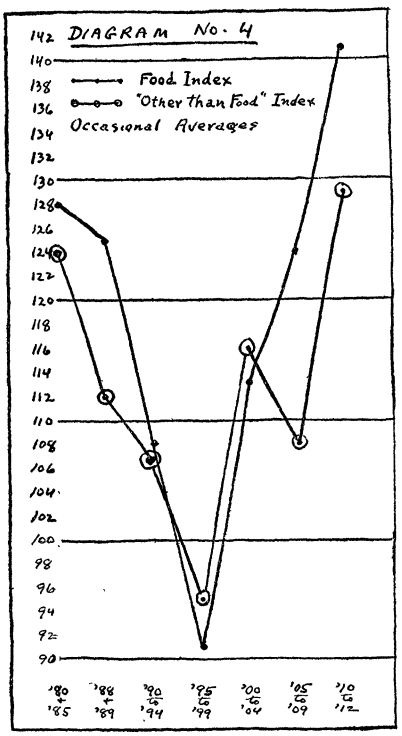


TABLE SHOWING FIVE-YEAR AVERAGES OF FOOD INDEX AND "OTHER THAN" FOOD INDEX

1880 and 1885 ...	128		124	
		— 3		— 12
1888 and 1889 ...	125		112	
		— 17		— 5
1890–94	108		107	
		— 17		— 12
1895–99	91		95	
		22		21
1900–04	113		116	
		11		— 8
1905–09	124		108	
		17		21
1910–12	141		129	

Naturally, lower prices for foods resulting from cheaper transportation and the displacement of farm labor by agricultural machinery resulted in a world-wide relative urban movement. Undoubtedly, several years of continued high food prices will prove the most efficient cause to encourage an increased production of foods. All legislation making agricultural credit available and affording opportunities to acquire land on favorable mortgage conditions will contribute to this end.

The third international cause is undoubtedly the increased production of gold[10] commencing in the late nineties. Just as excess of paper money in the Civil War period inflated prices, so the excessive gold supplies have inflated international prices, and all credit devices economizing the use of gold have helped to magnify the tendency towards inflation. Possibly, the greater advance in food prices of the United States is due to the greater influences of the first two international causes in the United States, and the so-called gold influence may be responsible for the larger part of the common advance. However, the relative importance of the three international causes may not be accurately estimated.

But the facts remain that the instability of the international price level is a disturbing element and the difficulty is that we measure all commodities in terms of one commodity rather than in the terms of fifty or more important commodities. In 1910, the writer recommended the establishment of an optional multiple standard,[11] possibly by the Bureau of Standards. In referring to this proposal, the Massachusetts Commission on the Cost of Living says:

> It is hard to see how any harm could come from giving official aid to the maintenance of such a standard for the use of any borrowers and lenders who chose to adopt it. In the event of a long continuance of the upward movement of prices, its use might prevent serious injustice and great hardship. We recommend that our senators and representatives consider the expediency of advocating its establishment.

The two classes which suffer most by the instability of the price level are wage earners and investors.[12] If wages were payable in the multiple standard, wages would fluctuate with cost of living and strikes would be diminished to a very great extent. If long time obligations were expressed in the multiple standard, creditors and debtors would exchange equal amounts of purchasing power. Now, all of these classes—the manufacturers, the labor unions, the bankers and the investors are intelligent. Why not leave the determination of the standard to agreement, and as a first step simply create an optional multiple standard which could be used when specified in wage contracts and in long time obligations.

The reasonable basis of an optional multiple standard would win its way and the economic benefits experienced would counsel its extension. By proper organization of clearing houses under a national clearing house,[13] by regulation of storage-warehouse warrants and the clearances of all classes of stock and produce exchanges, all transactions could be made either by the present currency made token money under a multiple standard, or by clearances direct in the optional multiple standard, since the holder of one unit of the optional multiple standard could convert into the value of any other commodity, if all prices

[10] Norton's "Gold Flood," *Cosmopolitan Magazine*, June, 1910.

[11] Norton's "The Remedy for the High Prices," *Independent*, February 10, 1910.

[12] Norton's "Stocks as an Investment when Prices are Rising," *Securities Review*, September, 1912.

[13] Norton's "Central Bank as a Federal Clearing House," *Moody's Magazine*, September, 1910.

were expressed in terms of the optional multiple standard, which involves simply a change of or a new definition of the dollar. This would be the final result, long anticipated by the economists. I quote from Patron's monograph on the Bank of France, prepared for the Monetary Commission:

> The interesting evolution of exchange which we are witnessing and which is familiar to everybody seems to be leading us, after the well-defined periods of barter and money, to a system of mere clearing of balances. All exchange operations would then be settled by simple book transfers. Coin reduced to money of account, would cease to play any real part. Economists are ever thinking of a return to barter, which would complete the cycle, bringing us back to the original state after thousands of years and combinations of all kinds. Such would be the course of this evolution.

But, as changes in monetary standards come very slowly, because men are unwilling to change the old landmarks without most careful investigations, we do not anticipate that the vision originally seen by Jevons will come to pass at once, even though the economists are again discussing this question after the lapse of many years.

If prices continue to mount actively, the agitation for such a change will occur with increasing force. But, we must remember, so far as the gold factor is concerned, that there are eastern nations with vast populations, capable of absorbing large quantities of gold under the stimulus of the western learning which is working as a yeast of progress among them. Further, we can steady prices and produce a declining tendency by requiring a larger proportion of gold in the reserves of the banks. This would at the same time strengthen the whole credit system. If we should go farther and require minimum flexible[14] reserves, higher in dull seasons and lower in active seasons, and incidentally higher on the average, as just suggested, a considerable fluctuating tendency would be eliminated.

[14] Norton's "Statistical Studies in New York Money Market," 1901.

After all, the Fabian policy lies before us, and looking ahead, it is probable that the agitation over this subject will be largely influenced by the course of commodity prices during the coming two years. This diagram discloses the quarterly fluctuations of my new international index number for the past five years. It is probable that we have passed the high point for two years or more, and that lower prices are now in order.

TABLE OF MONTHLY INDEX NUMBERS—NORTON INTERNATIONAL SERIES

	1907	1908	1909	1910	1911	1912
Jan. to March.....	125	117	116	125	124	129
April to June.....	127	116	118	125	124	135
July to Sept.....	126	115	119	125	125	132
Oct. to Dec.....	12	115	121	123	126	

If this position shall turn out to be correct, we shall be in a better position two years from the present time to estimate whether the growth of population, the absorption of gold by eastern nations and the higher level of prices shall have overtaken the rate of increase of gold production sufficiently to produce an era of falling prices. When this occurs, as it will occur, sooner or later, we shall have the reverse agitation of the agricultural classes against falling prices such as our country witnessed in the Populistic agitations of the early nineties.

The money question, which has been a political issue, constantly changing in form and exceedingly disturbing to business, will continue to be with us so long as the instability of the price levels continues.

One result of the prolonged advance in the cost of living has been to emphasize the necessity of "economy," not only personal,

but also "political," quite in the original sense of political economy. The very name of the movement which in a way is a constructive reaction from the economic stimulus of a lessened purchasing power is significant. I refer, of course, to the conservation movement. The word conservation, although vague, stands for the diminishing of wastes. In the conservation movement, we have a return to the original purposes of "political economy." The items which make up the cost of living as represented by an average family budget suggest plainly the directions in which the prevention of wastes may prove most fruitful. In the attempt to reduce the absolute cost of living, society wages an eternal warfare against the destructive wastes of nations,[15] which are preventable war, preventable ignorance, preventable sickness, whether physical, intellectual or moral, preventable death, preventable accidents to life and property, and preventable lack of opportunity which may delay or prevent the productivity of exceptional minds like those of Edison and Burbank, which exist in all degrees in certain proportions in the population. The latter waste is the greatest waste which society still permits. The public school system is an institution created to furnish equal opportunity for education, but it is probable that a system of vocational guidance for exceptional children, *i. e.*, above the average, would prove an extremely profitable policy for a nation to undertake on a large scale.

If we admit that in a population some are exceptional beyond others in intelligence, in foresight and in inventive capacity—and we know this to be true by the prevalence of idiots, insane persons, criminals and paupers, classes below the average—it follows that the larger the population of the same strain, the greater will be the number of exceptional minds above the average. It is self-evident that the national dividend of a better civilization is created by the exceptional minds of a nation for the higher utility of all. We reduce absolutely, not relatively, the cost of living when we discover a cheaper method of controlling the matter and the forces of the world. Thus, a natural tendency to progress[16] is inherent in an increasing population, unless checked by the destructive wastes of nations. Nor can we overestimate the importance of ethical and hygienic standards in the study of political economy. Our measurements and standards of utility must be based on ethical and hygienic values rather than on conceptions of ophelimity or desirability.

By ethical standards, we mean to include among others the more enlightened conceptions of jurisprudence, and by hygienic standards the well-balanced judgments of enlightened medical and sanitary experts. But the guidance of present statistics of the cost of living supplemented by vital statistics is essential to a balanced judgment and the lack of accurate statistics on social and economic subjects is well known. Without measurements, our conclusions must be vague.

J. PEASE NORTON

NEW HAVEN, CONN.

[15] Norton's "Economic Advisability of a National Department of Health," *Journal of American Medical Association*, August, 1906.

[16] Norton's "Cause of Social Progress and the Rate of Interest," *Popular Science Monthly*, September, 1910.

PLANS FOR A GREATER UNIVERSITY OF MONTANA

BETWEEN forty and fifty prominent citizens of all parts of the state of Montana met at Helena, December 23, and organized the Association for the Creation of a Greater University of Montana. This is to be brought about by the consolidation of the present iso-