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STABILISATION, 1914-1930**

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ABSTRACT

This paper examines the contribution made by the scientific management movement to the stabilisation of production and employment in the United States in the years 1914-1930. By focusing on the debates in the official journal of the Taylor Society, the paper is able to sketch the manner by which the ideas of the Taylorists evolved throughout this period. Beginning by concentrating on the development of stabilisation practices at the workshop level, it is shown that the scientific managers came to focus, in time, on the whole firm and eventually became convinced that an effective stabilisation strategy must embrace all levels of the economic environment.

Perhaps no better way exists of understanding the progress and diffusion of the [scientific management] movement than in tracing it through the files of the *Bulletin of the Taylor Society*, which has been hospitable to suggestions, from every source, for increased efficiency and which has recorded the chief successes and failures of the great variety of experiments in recent years (Rexford Tugwell 1927, 122).

In the labour economics literature, the notion of scientific management is associated with the American theorist Frederick Winslow Taylor and is primarily perceived as being an anti-worker, labour control strategy. The prevalence of this perspective, makes it difficult for analysts to comprehend why it was that the trade unions in the United States collaborated with the leaders of the scientific management movement through the inter-war years. It is our contention this development can be understood only if one is aware of the extent to which the Taylorists concerned themselves with issues such as the reduction of working hours and the democratisation of public institutions. Recent studies of the scientific managers' involvement in the above areas have been undertaken respectively by Nyland (1989) and Schachter (1989). These revisionist historians have sought to highlight the fact that labour control was far from being the scientific managers' only area of interest. In this article we seek to add to this literature by outlining the theoretical and practical contribution made by the Taylorists to the stabilisation of the business cycle and hence to the creation of employment security.

Taking up Tugwell's suggestion, the major vehicle we utilise to examine the scientific managers' contribution to

market stabilisation is *The Bulletin of the Taylor Society* (BTS). This journal, begun in 1914, was the official publication of The Taylor Society. The latter body was an organisation whose primary purpose was the promotion and development of the ideas of those individuals who worked with or who were inspired by Taylor. We have chosen to use the Society's journal as our instrument of investigation in order to reduce the danger that we will misrepresent the character of scientific management or be guilty of the myopia which distinguishes those analysts whom H.S. Person (1929, 5), the Managing Director of the Society through the 1920s, described as the "superficially informed". By this he meant those who believe that the "systematic planning and directing of work" constituted the whole of the Taylor system.

SHOP AND WAR PLANNING

Central to the scientific managers' approach to the stabilisation of the business cycle was their belief in the value of the scientific method of investigation. The Taylorists were convinced that rule of thumb and tradition were not acceptable bases for guiding the production and distribution of wealth. Indeed, Taylor insisted that the rigorous application of the scientific method to the problem of management was fundamental to the scientific managers methodology.

Scientific management cannot be said to exist in any establishment until after [a] change has taken place in the mental attitude of both the management and the men, both as to their duty to cooperate in producing the largest possible surplus and as to the necessity for substituting exact scientific knowledge for opinions or the old rule of thumb or individual knowledge. These are the two absolutely essential elements of scientific

management. (Taylor 1911, 1389)

In relation to the second element Person observed a decade later that scientific management contained two fundamental ideas.

The first is that management should analyze every phase or element of the business so far as possible in accordance with the scientific method—the method which by research, investigation, experiment or otherwise secures all available data concerning each phase or element of the business—physical, physiological or psychological—and derives therefrom relatively stable and dependable facts on which to base plans and procedures The second fundamental idea is that, those dependable facts once ascertained, plans for operation and operating controls shall be developed which are relatively precise in their intentions and expectations of results, because based upon a knowledge of conditions resulting from the preceding scientific analyses (Person 1921, 50).

Writing in 1929, Person observed that the issues the scientific managers focused upon tended to change over time. This tendency could be perceived in the work of Taylor and it was a process that continued after the latter's death. At the same time Person insisted that this constant modification of the ideas, areas of concern and techniques of scientific management in no way constituted an abandonment of Taylor's principles (1929, 10).

In both Taylor's own writings and in the work of Taylorists published prior to the United States' entry into the First World War, the advocates of scientific management primarily confined themselves to workshop problems wherein they applied their techniques to the determination of how and when production was to be undertaken. However, it should

be noted that at no stage was scientific management considered to be merely a labour control device or simply a philosophy designed to legitimate bureaucratic management systems.

As Taylor himself insisted, scientific management was more than just a program for time study or an incentive wage system; rather, it was a comprehensive plan, composed of a number of interrelated innovations that promised to improve the overall productive efficiency of the enterprise. The first step in the ideal scientific management program was always the improvement and standardization of tools and equipment and the improvement of various aspects of shop organization. The latter process could include the development of a better storage system, the installation of more comprehensive cost accounting procedures, and the establishment of a system for routine maintenance and repair (Meiksins 1984, 180).

It should also be noted that while Taylor confined the application of his ideas primarily to the workshop he never believed they were only applicable in this arena. He concentrated on the shop because he was convinced this was where he could make his greatest contribution but he urged others to seek to apply the scientific method to the management of all areas of productive activity.

That the pre-war Taylorists had concerns that were broader than the workshop is manifest in the fact that as early as 1908 there are indications of concern in the work of some of these individuals of the fact that productive efficiency tends to be undermined by the volatility of the capitalist business cycle. Prior to the founding of the *BTS* individual employer members of the scientific management movement experimented with a range of measures designed to stabilise the demand for their products and the employment security

of their employees. Of the latter individuals the most influential and innovative was Henry Dennison an employer who later served a term as President of the Taylor Society and who was subsequently described by J.K. Galbraith (1981, 61) as "arguably, the most interesting businessman in the United States".

Metcalf has observed that after the depression of 1908 Dennison "introduced practically the whole gamut of measures promoted to 'regularize' business operations" (Metcalf 1975, 63).

First, the company modified the time pattern of its demand by reorganizing its sales department to make it more responsive to efforts to reduce the costs of instability, by applying sales effort to secure orders further in advance and increase business during slack periods, and by diversifying into new markets to spread demand. Second, it made production rates more stable than orders and shipments by systematically producing to inventory during slack periods. Employment was made more stable than production by a policy of training workers for transfer between departments. A third measure, begun after the 1914 depression, involved counter-cyclical planning of plant construction. Finally, the company secured its outstanding reputation in the field of employment stabilization by establishing, in 1916, the first company unemployment compensation fund in the country (Metcalf 1975, 63).

Galbraith reports that Dennison's adoption of these stabilisation techniques was resented by other employers who organised a boycott of his firm on the grounds that he was "spoiling the working classes" (Galbraith 1981, 62). This contrasts with the warm reception of his ideas within the Taylor Society whose members perceived the downturns in economic activity that periodically characterised the business

cycle as both a disaster for employers and employees and as enormously wasteful of resources. The Taylorists' perspective regarding the waste induced by the business cycle is encapsulated in a 1923 observation by N.I. Stone in the *BTS*.

The recurrence of business cycles is one of the worst, if not the worst, disturbers of managerial plans for the orderly and economic operation of industrial plants. Efficient plant operation above all requires regularity in the repetitive processes of industry. This regularity is widely upset by the intrusion of outside economic forces having nothing to do with internal plant management and over which the plant engineer has no control. Plant organizations, including specialists of high degree, skilled mechanics trained and disciplined through years of hard work in the special processes developed in the particular plant, plant morale built up through the laborious effort of the employment manager, an esprit de corps, developed among the staff of executives and foremen, are all swept away almost over night through the necessity of shutting down the plant dictated by the sudden cessation of orders and the drying up of bank credit When plant operations are resumed after the storm is over, most of the work of the plant managers must be done over again with a newly rebuilt organization. Even the work of unskilled labor suffers under the circumstances, for there is hardly any labor, no matter how low the degree of skill, that does not gain in efficiency through acquaintance with and adaptation to the conditions of each plant, and it therefore takes time to "tune up" a plant to a performance somewhere near 100 per cent of its capacity (Stone 1923, 93).

Dennison's stabilisation techniques were applauded in the *BTS* in 1915 in a paper by R.G. Valentine titled 'Scientific Management and Organised Labor'. In this article Valentine called upon the members of the scientific management

movement to emulate Dennison's policies and to strive to plan production in a manner that would dampen the fluctuations caused by both seasonality and by the business cycle.

[Y]ou should plan as far as you possibly could for regularity of employment; first by regulating your own business to the greatest extent possible, and secondly, you should establish and have some idea of co-operative relationship with other concerns in other lines of industry, so that when your slack period came, when yours came against his full period, you could make some shift to the advantage of each, and thirdly, as business men looking after your own interests you [should] take some kind of interest in state public work, so the state would not be going into the market when wages were high and business good, but instead when condition of unemployment bad (Valentine 1915, 5-6).

The volume of the *BTS* published in 1916 was even more propitious both as regards the notion of market stabilisation. In an article titled 'The Progressive Relation Between Efficiency And Consent', Valentine (1916: 11-13) argued that the Society needed to widen its focus from particular plants to the entire field of industry. He called for the establishment of a planning department within the Society which would investigate not only the best way to organise production and distribution but which would also study the social, industrial and moral effects of various forms of production. However, for our purposes the most significant paper of this volume was presented by H.S. Person. The latter, aware the fluctuations that characterised the business cycle were a major cause of waste and inefficiency and that the slumps associated with these cycles had a disastrous effect on the lives of workers and the profits of firms, observed that the systematic planning of production had much to offer those who would

provide workers with greater job security.

I think I see in it [the notion of planning] the opportunity for regularizing employment I do not see any possibility of regularization without precise knowledge of facts, ability to predict, and precise control; and one plant—a Scientific Management plant—has had the nerve to tackle the problem of regularizing employment by deliberately not making all it can in full season and holding production over to the dull season (Person 1916, 21).

When the United States entered the First World War, most of the leading Taylorists took employment with government agencies such as the War Industries Board (Haber 1964, 118-120). This latter body has been described by Schlesinger (1957: 40) as "the central experiment in economic planning" of the war period. Through the Board, the Federal Government directed industrial production, selecting industries and products which were considered essential and giving them preference in the use of materials, labour, capital, and transportation. Unlike the planning adopted subsequently in the Soviet Union the American planners did not seek to substitute state ownership of the means of production for private enterprise. This point has been stressed by Soule (1967) in his history of American economic planning in order to make the point that planning even when undertaken at a national level does not necessarily mean the abolition of market forces, or the outlawing of private property or the profit motive.

Rather, it means influencing existing economic habits and outlook by a program which serves needs not contemplated by, and not normally fulfilled by, the existing order. National planning looks at wider horizons or longer futures than do the daily

decisions of the managers of individual firms or industries. And its goals, if sanctioned by the citizens, make use of foresights and capabilities developed by the "organizing man", in the domain of a whole society (Soule 1967, 16).

HERBERT HOOVER AND WASTE

The Taylorists' experience with war planning had a dramatic effect on the thinking of the leaders of the scientific management movement. They were tremendously impressed at the extent to which the government's program of managed mobilisation expanded industrial output. Through the war, as John Maurice Clark (1931, 170) a frequent visitor to Taylor Society meetings has noted, American industry proved capable of producing at a capacity that had previously been held to be unattainable. With the end of the conflict most observers argued the war experience offered no insights for the conduct of business in peacetime. The members of the Taylor Society, on the other hand, tended to believe that the war had vindicated their belief that conscious, systematic intervention in the production process had the potential to expand dramatically the wealth of society (Person 1919, 10-14).

H.S. Person observed in 1927 that the war experience changed the scientific management movement from a force concerned with the "stabilization of shop processes" to one whose focus was the "stabilization of all the processes of the enterprise" (Person 1927, 391). This transformation is exemplified in the post-war ideas and practices of Herbert Hoover, the most prominent advocate of scientific management through the 1920s. In his respective positions as President of the Federated American Engineering Societies, Secretary of Commerce and President of the United States, Hoover played a critical role in furthering the transformation

of scientific management from an enterprise concern to an industry and eventually a national affair. Though an enthusiastic supporter of capitalism, Hoover accepted that the market did not always allocate resources in the most efficient manner. He therefore supported the use of the visible hand of planning at both the micro and macro level and thought himself to be a "scientific manager of the economy" (Barber 1985, 99).

Where classical economists mooted unrestrained competition between independent economic units as the best means of ensuring prosperity, Hoover envisaged active cooperation between business and government (Wilson 1975, 68). However, he was not a "statist" He had a deep ideological commitment to the notion that private and local public institutions, had to accept responsibility for solving social problems. Consequently, he rejected both federal government direction of economic activity and the enforcement on individual firms of the policies of those trade organisations that claimed to represent the collective interests of business. While he believed in the need for "national planning of industry and commerce" he meant by this only that decentralised corporate planning should take place within the context of a larger perspective than the individual business and this especially so as regards such issues as the standardisation of parts and equipment. The state itself was not to directly plan and direct industry. Rather its role was to assist firms to plan effectively by accumulating and disseminating knowledge of existing trends within the economy. Hoover believed the "associative state" he envisaged would provide a "middle way between laissez-faire, antistatist economic formula that would ruthlessly 'liquidate' wages and jobs and statist proposals that would expand bureaucratic controls destructive to American

enterprise" (Murphy 1988, 10 - 11). In the early 1920s he maintained that: "If we could secure this cooperation we should have provided a new economic system, based neither on the capitalism of Adam Smith nor upon the socialism of Karl Marx" (cited in Layton 1971: 192).

In November 1920 Hoover was elected President of the Federated American Engineering Societies. His election was largely a consequence of the fact that 'progressives' within the professional engineering associations were demanding that their societies play a larger role in the social life of the nation. Metcalf (1975,64) reports these progressives came largely from that sector of the engineering profession who considered themselves the "heirs of Frederick Taylor". The influence of this faction was reflected in the fact that immediately following Hoover's election the executive of the Federation approved a proposal for "an investigation of Industrial Wastes" and appointed Taylor Society members to the majority of the positions on the Committee charged with conducting the study (Layton 1971, 194).

The Committee on the Elimination of Waste in Industry began its work early in 1921, some fifty engineers gathered information on two hundred and twenty-eight plants in six major industries. The Committee used a common-sense approach to define industrial efficiency expressing waste as the difference between the average efficiency of the enterprises sampled in each industry and the most efficient plant in the same class (Mitchell 1922; Knoeppel 1922). What Hoover hoped to achieve in the waste survey he made clear in a paper he published in the *BTS* (Hoover 1921). He stated that the study would attempt to visualise the nation as a single industrial organism and identify the primary factors obstructing the maximisation of production. He believed the major causes of industrial waste were the inefficient use of

labour, poor coordination between industries and lack of standardisation. The greatest single factor obstructing output maximisation he maintained were the "large periods of slack production and unemployment" that occurred as a result of the "ebb and flow of economic tides between booms and slumps" (Hoover 1921, 78).

Hoover's solution for the instability caused by the business cycle was the "coordination of great industries" by the provision of appropriate knowledge. He accepted the validity of Say's Law that supply creates its own demand but accepted that overproduction could occur as a result of industries producing the wrong goods because they lacked adequate information.

There is no such thing as the nation over-production, if it produces the right commodities. The commodities or services produced by the whole nation are capable of absorption by the whole nation if they are of the right character. In other words, if we could attune the whole industrial machine to the highest pitch an increasing production would mean a directly increasing standard of living (Hoover 1921, 77-78).

Hoover accepted it was not possible to attain the "ideal" of a constant steady increase in production because of society's "inability to ever gauge the advance on growth consumption or the approach of saturation". However, he believed that if private and public enterprises were provided with more "timely, more regular, and more complete information of the current production and consumption and stocks of the great commodities in the United States" it would be possible to "clip the top of booms and the depression from slumps" (Hoover 1923, vi-vii).

The Waste Committee concluded that the primary source of inefficiency within the USA was the poor quality of its

management. It also endorsed Hoover's belief that management's inability to stabilise the business cycle was the single greatest source of inefficiency. Consequently, the Committee argued that it was critical that there be developed means for reducing the volatility of market fluctuations. At the level of the enterprise it advocated the closer correlation of production schedules with sales policies and the balancing of productive capacity (Committee on Waste in Industry 1921, 25). It also recommended the development of programs that would lessen the seasonal character of production in such industries as construction and coal mining, the establishment of trade associations which would collect information on output and stock levels and the planning of investment so that this form of spending would act as a stimulant in times of recession. Of the last issue the Committee observed:

Studies of industries as a whole show that we usually expand our equipment as the periods of maximum demand for products instead of doing our plant expansion during periods of slack consumption. While it cannot be expected that all industry could be so stabilized as to do its capital construction in slack periods, there are some industries which could be led in this direction by co-operation with the government and co-operation among themselves. This applies particularly to railways, telephones, telegraphs, power concerns and other public utilities, and to expenditure upon our municipal, state and national public works (Committee on Waste in Industry 1921, 32-33).

The breadth of the Waste Committee's report justifies Metcalf's claim that the study was a landmark in the transition of scientific management from what Hoover characterised as its pre-war devotion "to the minutiae of shop and office routine [to] broad questions of policy-making" (cited by Metcalf 1975, 64). Within the Taylor society the report was

warmly though critically received. This response reflected not only the composition of the Waste Committee but also the fact that as Drury observed in 1922:

[T]he leaders in scientific management have lately come to feel that the highest efficiency in industry and, indeed, all industries are studied and improved as one whole. The movement in this direction has been led by Herbert Hoover, first as president of the Federated American Engineering Societies, and more recently as Secretary of Commerce (Drury 1922, 9).

That the Taylorists considered the report to be the product of their efforts was made clear by Person in a 1923 *BTS* paper titled 'On The Contribution Of Scientific Management To Industrial Problems'. In this article Person observed that the work of the Committee on the Elimination of Waste was Taylorism in its purest form. The Committee "was composed largely of Taylor engineers, its point of view was entirely Taylor, and the standards by which it judged waste were the standards of scientific management" (Person 1923, 118).

Hoover's promotion of the scientific management movement continued after he was appointed Secretary of Commerce. He employed E.E. Hunt of the Taylor Society as his personnel assistant and together they reorganised the Department. In this reorganisation the Division of Building and Housing was developed in order to eliminate wastes in the building industry by developing uniform municipal building codes, by reorganising the financing of the industry and by studying city and town zoning (Hunt 1924, xiii). A central place was also accorded a newly created Division of Simplified Practice which Barber reports was staffed by "a stream of talents flowing from Frederick Taylor's campaigns for scientific management" (Barber 1985, 13). The latter Division, as Hunt observed in his 1924 volume *Scientific*

Management Since Taylor, was organised as a national agency "through which the elimination of wasteful types and varieties of products, processes and methods can be brought about as a result of voluntary agreement by groups of producers, distributors and users" (Hunt 1924, xiii). The consequent savings of this latter division alone were estimated to be \$600 million per annum which, as Barber (1985, 13) has noted, was no trivial sum in an economy in which value added by the manufacturing sector was \$18 billion.

In the midst of the deep economic slump of 1920-1922 Hoover also had Hunt organise the first national unemployment conference ever convened by a federal government department—the President's Conference on Unemployment. The latter act led to the creation of a permanent committee which under the guidance of Hunt published or actively collaborated with the American Engineering Council in the preparation of a number of major studies directly related to the stabilisation of the business cycle through the first half of the 1920s. These reports included, *Business Cycles and Unemployment* (1922-1923), *Coal Storage* (1923-1924) and *Seasonal Operation in the Construction Industries* (1923-1924).

The stabilisation reports advocated a number of devices for reducing both the volatility of the business cycle and unemployment. These included the use of public works spending as a countercyclical device and the establishment of public employment exchanges. However, what distinguishes the reports was the degree of emphasis placed on the extent to which improving the management of individual enterprises could enhance stabilisation. This perspective reflected the focus of those scientific managers concerned with the issue of unemployment in the early 1920s. Their perspective was well

captured in the following statement by Morris Cooke in a paper on unemployment and underemployment he published in the *BTS* in 1921. "The maximum relief from the evils attendant upon unemployment will come about through a localization of the problem within the individual manufacturing plants" (Cooke, 1921, 163). The Taylorists did not believe the scientific manager, operating solely within the enterprise, could solve the unemployment problem per se. As Person observed, in an address to the American Association of Public Employment Officers in 1920, the scientific manager's focus was the "immediate operating policies and methods" of the enterprise. Much of the root cause of unemployment, on the other hand, was centred at that level of business activity that was speculative and/or was concerned with the "far-reaching, governing activities" of enterprises. Even so, Person insisted, scientific management could contribute greatly to the minimisation of the unemployment problem by enhancing the operating methods of the firm.

Most enterprises operate under competitive conditions in markets in which the demand fluctuates. Business has not learned how to free itself from those alternating conditions known as buyers' and sellers' markets; not have many enterprises learned how to free themselves from the seasonal demands which characterise the disposition of their output. Under such circumstances the taking on of workers in one year and the discharge of workers in another year, or the taking on of workers in one season and their discharge in another, is to some degree inevitable; and only the most scientific of managements is able to reduce these variations in employment to a minimum. The competitive enterprise which succeeds in reducing these variations to a minimum is the enterprise which works out a balanced production of the various products according to seasonal demand; which establishes a

schedule which coordinates the financing, producing and selling of these products; which has such organization and methods of planning and operating control in its several departments as to maintain the schedule of coordinated financing, production and selling; which as a result of exhaustive investigation and analysis has such command of the elements entering into its operations as to make possible the coordinations, schedules and controls I am enumerating In the degree to which an enterprise has such management may it hope to achieve continuity of employment. That kind of management is scientific management (Person 1921, 51).

In 1922 the scientific managers' perspective regarding the contribution of the firm to market stabilisation was further clarified in the *BTS* by H. Feldman, research secretary for the Economic Advisory Committee of the President's Unemployment Conference. In an aptly titled paper, 'The New Emphasis in the Problem of Reducing Unemployment', Feldman lauded William Beveridge and Sidney and Beatrice Webb for highlighting the fact that unemployment "is not due to overpopulation, immigration, changes in the gold supply and other disturbing factors, but to cyclical fluctuation, seasonal irregularity and other maladjustments of the industrial system" (Feldman 1922, 177). While applauding his British counterparts Feldman observed that he believed the contribution of these individuals was flawed by a failure to appreciate the part that can be played by the individual firm.

[A]n important cause of unemployment might be in the slipshod, careless and planless management prevalent in various firms that some employers, at least, could cut down the irregularity of their businesses by improvements in the technique of business administration (Feldman 1922, 176).

Noting that firms whose heads were members of the Taylor Society had been particularly prominent in the development of enterprise stabilisation he reported that the President's Committee on Unemployment was seeking to encourage American industry as a whole to adopt similar strategies. Like Person he acknowledged that enterprise stabilisation alone would not solve the unemployment problem but also insisted:

When efficient management has done all that should be expected of it, the disease of unemployment will be so moderated that a complete cure through the aid of the other and less important remedies discussed should not be difficult (Feldman 1922, 182; see also Feiss 1921).

THE 'SECOND INDUSTRIAL REVOLUTION'

The Taylorists' emphasis on microeconomic reform in the first half of the 1920s was reflected in the *BTS*. Through this period the articles published that were directly relevant to the problem of stabilisation tended to emphasise the individual firm. However, one key aspect of economic stabilisation the contributors to the journal did believe needed to be handled at a macro level was the management of the nation's money supply. In 1921 Irving Fisher presented a paper to the Taylor Society in which he argued that the stabilisation of the economy and the full development of efficient production were simply not possible without a stable currency. Fisher was a pioneer in the development of index numbers which were capable of showing the average change in prices over time. He had a deep respect for Frederick Taylor and believed that his own character, ideals and methods of work were identical with those of Taylor (Fisher 1956, 215). The development of

effective means of measuring price changes, Fisher also believed, had provided the basic instruments required for the "scientific management of the money supply". Fisher's paper, 'How an Unstabilized Dollar Interferes with Efficient Management', argued that falling prices tend to have a dampening effect on the economy. He also observed that if prices changed it often took consumers and investors an extended period before they adjusted their spending patterns accordingly. The deleterious effect this rigidity had on economic behaviour, he observed, could be overcome with the use of index numbers. Using these numbers the Federal Reserve Bank could manipulate the money supply in a manner which would adjust the amount of money in the economy in accordance with changes in prices and so stabilise the purchasing power of the dollar. Only if the currency was stabilised, Fisher insisted, would it be possible to contain the volatility of the business cycle.

Fisher's claim that the Federal Reserve should manage the money supply so as to ensure price and hence market stabilisation was welcomed by the Taylor Society. Likewise, the Society gave the approval of publication to a paper presented at its next meeting by Carl Snyder of the Federal Reserve. Snyder's paper, 'Barometers of Production', argued that market stabilisation required that the Federal Government not only develop a stabilised system of currency but that it also stabilise credit and establish a means for providing accurate and detailed data that would enable business to understand what was happening within the economy (Snyder 1921, 186-187).

While the Taylorists in the early 1920s approved of Fisher's ideas, even at this stage some individuals saw the dire possibilities inherent in his analysis. The first indication of this concern in the *BTS* was a paper by Person titled 'Shaping

Your Management To Meet Changing Industrial Conditions'. Person, whom it should be noted had a PhD in economics, presented his paper to the Society in November 1922. This was a time when the economy of the USA was emerging from the post-war depression and entering the period of rapid industrial growth that was to characterise most of the rest of the decade. In his article, Person warned that there was a new predicament looming for American industry. This problem centred on the relationship between prices, demand and the productive capacity of industry.

During the past decade, as a result of the study of earlier cyclic movements, we have learned that certain economic phenomena, such as the quantity of money and credit, have a definite relation to industrial activity. The store of money and credit influences prices and the price movement influences industrial activity. We should recall that the long period of accelerating industrial activity culminating in the frenzy of 1920-21 was coincident with a long upward swing in prices; that in general industrial activity increases in intensity with an upward price movement, is stagnant when there is a downward price movement, and is hesitant and uncertain in the early years of a new stable price level. Of course, the ideal condition is a fairly stable general price level, but when a condition of stable price level suddenly confronts an industrial generation which has become accustomed to a consistent upward price movement over a long period, the new condition of stability, because different from the accustomed, is upsetting to the individual, either as demander or producer, and it takes a considerable period, measured not in months but in years, for him to learn just what he can safely do both in purchasing and in producing (Person 1922, 212).

Why the effect of price changes so concerned Person was

because the Harvard Committee on Economic Research had recently forecast that over the next decade prices were likely to remain at a new high level. He doubted the validity of this assessment because he felt the Harvard Committee had "failed to take into consideration the capacity of American managerial genius to vastly increase, when put to it under intensely competitive conditions, the quantity of goods for exchange which may be produced from a given combination of plant, equipment, materials and labor" (Person 1922, 213). However, even if the Committee's forecast was correct it suggested that for some time into the future both producers and consumers were likely to be unsure of the new relation between their incomes and the cost of living. The conclusion he urged the members of the Taylor Society to draw from these observations was that for the next decade consumers' demand was likely to remain hesitant and uncertain. Given the nation's newly developed capacity to produce, a capacity which Person correctly predicted was likely to be enhanced through the 1920s, this would mean demand was likely to be out of proportion to the supply of goods. Having made these observations Person advised his listeners that these developments confronted American management with a fundamental problem.

The essential practical elements of the problem may be summed up as follows: On the side of supply there is a tremendous production capacity involving heavy investments of capital in more or less specialized equipment, to preserve the value of which will require a continuation of the lines of activity for which it was designed. On the other side of demand there is a conservative and hesitant market—in fact a buyers' market—which will continue for a considerable period (Person 1922, 214).

Person insisted that he was confident that American

management could resolve the demand problem. However, to achieve this objective it was imperative that the managers of enterprises give much greater attention to the social sciences in order that they might better comprehend the nature of an economy characterised by a buyers market. They needed also to accord much greater attention to the problems associated with marketing. It was no longer adequate to concentrate merely on developing the scientific management of production. In an economic environment in which demand could not be assumed to be readily forthcoming it was imperative that an equal degree of attention be applied to the management of markets.

Person's concern with the issue of demand management was reflected in the *BTS*. Through the middle years of the decade numerous papers appeared in the journal advising managers on how they could improve their marketing and coordinate sales and production. There was also a laudation of the productive benefits of high wages and an increase in the number of articles on the positive role that trade unions could play in ensuring workers received a share of the rewards of enhanced production commensurate with their input. Person's suggestion that the scientific management movement needed to pay much greater attention to the study of how markets functioned was also reflected with the journal publishing an increasing number of articles written by economists on the relationship between output and demand.

The initial *BTS* contribution from the economists in reply to the concerns raised by Person came from Irving Fisher who in 1924 leapt to the defence of Say's law. Fisher insisted there was no real problem as far as demand was concerned for the market would ensure that as output increased so did real wages.

Even if it were possible for employers at first to "hog" all the savings accruing from scientific management and refuse to give any bonus to labor, in the end the advantages would percolate through-out society just as today we all get the advantage of the telephone despite the enormous returns to the few original investors. In the end labor gains the most from so-called "labor saving devices." Increased production means simply increased income to society, and the wage earner as a class usually profits most in the end. Scientific management by which the bricklayer doubles or quadruples the number of bricks laid, reduces the rent of brick houses. Scientific management which makes more shoes and clothes decreases the real cost of shoes and clothes to all. Real wages consist of shoes and clothes and shelter and food and the other things which labor consumes. Any device which facilitates their production tends to increase real wages (Fisher 1924, 241).

Fisher concluded his contribution by advising employers and employees to focus ever more closely on increasing output and leave the issue of distribution to the market. His faith in market forces, however, does not appear to have satisfied the apprehension of all those who were concerned with the relationship between output, consumption and economic stabilisation. In December 1925 Paul Douglas presented a paper at the American Economic Association Conference titled 'The Movement of Real Wages and its Economic Significance'. In this paper Douglas traced the change in wages that had occurred in the United States through the period 1895 -1924. He reported that in 1924 wage-earners in manufacturing and transportation could purchase 27 per cent more goods and services than in 1890 with virtually all of this improvement having occurred since 1914. He acknowledged that worker productivity through the post-1914 period of accelerated productivity growth had increased

at a faster rate than the real increase in wages. However, he suggested that most of the discrepancy could be explained by the significant increase that had occurred in the proportion of the workforce employed as salaried staff (Douglas 1925).

Douglas's conclusion that employees were in fact receiving an almost proportional share of the rewards of the increasing productivity of American industry was accepted by the discussants at the economists' conference. This included George Soule, an individual who subsequently became a committed participant in the scientific management movement and a critic of those who had failed to give sufficient consideration to the problem of effective demand. However, more interesting for our purposes was the contribution of the industrialist Magnus W. Alexander. The latter observed that he was not an economist but an engineer who was interested in the extent to which economic theory could reveal facts and furnish guiding principles to practising industrial managers. Reflecting the Taylorist's concern with the issue of distribution he observed that what managers especially needed from the economists was a formula that would provide a basis for equitably dividing the wealth produced by industry's utilisation of scientific management amongst society's many competing interests. He was insistent that this formula must be both capable of dealing with dynamic situations and of being adapted to the specifics of differing industries and enterprises. This was because:

Efficiency, first of all, is a problem of individuals and cases, in relation to particular processes or separate productive organizations. Scientific management, which is the fundamental basis of efficiency, is concerned only with the organization of men, materials, and machines, for the most effective manufacture of particular products in particular plants under particular

conditions. Therefore, organizations and formulas embracing diverse groups, different establishments, diverse processes, however pertinent they may be to other purposes, are necessarily irrelevant or extraneous to the requirements of scientific management (Alexander 1926, 67).

Alexander was not alone at the 1925 conference in observing that industry was in dire need of an effective theoretical instrument for allocating the "fruits of production". This claim was also voiced by John Frey of the American Federation of Labor. At a round table session on, 'The Consuming Power of Labor and Business Fluctuations' Frey disputed the claim that workers were being paid a wage commensurate with their increasing productivity. While lauding the contribution of the engineers to the management of resources he noted that "perfect management" of an enterprise was of little value if the firm was simply not operating. He therefore urged the economists to find some means to enhance the purchasing power of the worker. Where Person, with whom the AFL was by this time closely collaborating, had accepted that American managers would find a way to deal with the demand problem, Frey was much more alarmist.

The greatest problem facing modern industry is the fact that it has failed to establish a market which could purchase its products. Unless wages increase in proportion to the increasing power of industry to produce, depressions in business must become increasingly frequent and severe. Cycles of business will undoubtedly continue, but the extent and duration of depressions will be influenced very largely by the purchasing power of wages which are being paid (Frey 1926, 83).

Alexander and Frey's request for a formula for equitably

dividing the rewards of increased productivity produced fruit in the form of the Cobb-Douglas function. Cobb and Douglas presented the results of their collaboration at the 1927 conference of the American Economics Association in a session titled 'Economic and Social Aspects of Increased Productive Efficiency'. As a consequence of a request from the Economics Association, Woodlief Thomas of the Federal Reserve Board also presented a paper at this session. The latter's paper, 'The Economic Significance of the Increased Efficiency of American Industry', observed that in the sixteen years 1899 to 1914 productivity growth in manufacturing had expanded by less than 0.5 per cent. In the eight years 1919 to 1926 conversely output per worker increased by almost 40%. Nor was this expansion confined to manufacturing for comparable rates of growth were experienced in mining, transportation and agriculture (Thomas 1928; Durand 1930).

A rate of productivity growth of this magnitude, Douglas (1927, 20) noted elsewhere, was "probably unparalleled in the history of the world". This perspective was endorsed by Ewan Clague who in a series of articles in the *Monthly Labor Review* reported on the extent of the transformation within US industry. Clague (1926, 1) argued that the United States was experiencing what was "perhaps the most remarkable advance in productive efficiency in the history of the modern industrial system" and that the nature and extent of this advance was such that it had to be considered nothing less than a "second industrial revolution". What had caused this phenomena, Clague advised, was difficult to specify. He identified what he thought were the more significant influences amongst which he included the rationalising activities of the scientific management movement. However, he failed to accord any weighting to these influences and hence his contribution was more a sketch than an exercise in

explanatory analysis.

Others proved less reluctant when asked to explain the extremely high rates of productivity growth that characterised American industry in the 1920s. Through the rest of the decade foreign observers flocked to the United State seeking to find the secret of America's enhanced ability to produce. The opinions of these individuals was summarised by Edwin Gay in the 1929 volume *Recent Economic Changes*. This book was the product of a study commissioned by Hoover which sought to specify the character and source of the post-war productivity eruption. In his summation Gay noted that while foreign observers emphasised the importance of America's natural resources, labour saving machinery and vast market when explaining US prosperity, they invariably concluded that an important factor inducing the post-war acceleration in the rate of growth was the widespread adoption of scientific management practices. Indeed, many concluded that this was the key explanatory factor.

The problem of correlating abundant resources, expensive labor, and unsurpassed machine equipment, to serve the greatest of markets, has put a high premium on management and organizing capacity. Scientific management in industry and commerce, apparently the resultant of emerging pressures, is thought by many of the foreigners writing on recent economic changes in the United States to be the chief contribution which this country is making to economic welfare and to be the key to its success (Gay 1929, 5).

Hunt (1929, 35-39) reported in the *BTS* that the American contributors to *Recent Economic Changes* generally endorsed the perspective of these foreign observers. It was accepted that the application of scientific management practices into ever new areas of the economy had given a tremendous boost to

the pre-existing forces inducing productivity growth within the economy. Hunt advised that Wesley Mitchell had captured accurately the conclusions of the contributors in a "single striking sentence" when the latter observed: "Since 1921, Americans have applied intelligence to the day's work more effectively than ever before". While a little more verbose, the spirit and essence of the report was possibly best captured by Stanley H. Jevons in *The Economic Journal* in 1931. Appreciating the implications of what was happening in America Jevons observed:

The Advanced industrial countries of the world are now in the first stage of a sweeping change of the methods and organisation of all their secondary industries, and this new movement is likely to be comparable in its industrial, commercial and social effects with that series of changes which commenced in the latter half of the eighteenth century and is commonly called the Industrial Revolution. The changes are coming about as the result not merely of the application of scientific knowledge to industry, which was, in fact, the last phase of the first industrial revolution, but of the use of the inductive method in the study of an industry, and individual concerns composing it, with a view of gaining facts and generalisations which may serve sooner or later as the basis of the replanning of the productive process and plant. The essence of the new industrial revolution is the search for exact knowledge, and the planning of processes: from the minutiae of manual operations (based on motion study) to the lay-out of the machinery of a gigantic plant—even of a whole industry throughout the country (Jevons 1931, 1).

Jevons accepted that the 'second industrial revolution' had been a long time in coming and that the American scientific managers were not the only contributors to its development. However, he made it clear that he also accepted that the "date

1911, when Taylor published his famous *Principles of Scientific Management*, inaugurates a definite acceleration of the second industrial revolution" (Jevons 1931: 2).

The members of the Taylor Society were themselves more circumspect in utilising the term 'Second Industrial Revolution' but accepted that the significance of what was occurring in the United States justified its use. Shortly after the publication of *Recent Economic Changes* and at the instigation of Edward Filene of the Taylor Society, the American Academy of Political and Social Science held a conference under the rubric of 'The Second Industrial Revolution and its Significance'. The subsequent volume of the Academy's *Annals* was edited by Percy S. Brown, a past president of the Taylor Society. In his opening address Henry Dennison (1930, 1-2) observed that he had sympathy with the "more careful social scientists" who were troubled by the term 'Second Industrial Revolution' but justified its utilisation as accurately capturing the speed of the recent economic changes that had occurred within the United States. He also justified the utilisation of the term on the pragmatic grounds that it was critical that analysts appreciate the urgency of the need to give consideration to the probable consequences of the transformation that was occurring.

The concern Dennison clearly felt was also expressed by H.S. Person. In his paper to the conference Person attempted to highlight the fact that the Committee on Recent Economic Changes had concluded that the outstanding problem of the day confronting industry was the need to find some means for attaining economic balance. Noting that both classical and Marxist economics assumed demand always pressed upon supply he insisted that what was happening in America had negated this assumption.

Within two decades the very productivity of scientific management and of mechanization has transformed the assumption in economic conduct to that of a surplus economy. While it may be that this concept of a surplus economy cannot be permanent, it is now, and apparently for a long time will be, the dominant influence in our economic conduct (Person 1930, 91).

It was therefore critical that appropriate demand-centred policies be developed that could deal with this new situation. What America required urgently, Person and Dennison had come to believe, were new techniques for managing the economy at the macro level. Further, they believed that it was necessary to accept that in some instances these techniques would have to involve "direct and indirect social control of the individual enterpriser through measures analogous to traffic lights" (Person 1930, 90). In short, they believed the problems generated by the emergence of a surplus society simply could not be left to resolve themselves and moreover their resolution could not be left in hands of an unregulated market.

[W]e *must* manage ourselves if we are to gain on the past. No laissez faire, no unchanneled and unimpeded course of nature, no invisible hand will do it for us. Unless there is growing social control to meet the unquestioned growing social complexity, most of us must believe, I think, that we can expect no happier fate for mankind; and many of us would risk the prediction of retrogression to ultimate catastrophe (Dennison 1930, 1-2).

DEMAND MANAGEMENT AND DEPRESSION

The perspective advanced by Dennison and Person in 1930 was far and away from the enterprise centred focus they had

advocated in the early years of the 1920s. An understanding of how this transformation came about can be attained by examining the debates that occurred within the Taylor Society in the later years of the decade. Perusing the *BTS* it is clear that from late 1927 at least some of the leaders of scientific management movement were becoming concerned that their stabilisation policies were not having the degree of success that had been envisaged. In December 1927 the industrialist Wilfred Lewis delivered a paper to the Taylor Society in which he lauded the achievements of the scientific management movement. Lewis claimed the four key objectives of the movement had become the reduction of costs, the raising of wages, the encouragement of collaboration between employers and employees and the full employment of workers and machinery. The extent to which these objectives were being attained, he concluded, enabled the people of "America to look forward hopefully to the future" (Lewis 1927, 557).

The response to Lewis' paper indicated that not all members of the Taylor Society shared his optimism. While he was praised by some commentators, his suggestion that there was wide acceptance amongst employers of the positive value of high wages was challenged. It was also observed that his belief the good times were "practically certain to continue is an assumption which may well be questioned" (Muste 1928, 47). The concern within the Society was also manifested at the December 1927 convention by the presentation of two papers dealing with macroeconomic demand management and wages respectively. Person's decision to accept these latter papers for presentation and subsequent publication was a consequence of his concern at the fact that unemployment had risen sharply in mid 1927 and his belief that the enterprise focused strategy for attaining stabilisation had not realised its

desired goals. He noted in an editorial in the *BTS* that the enterprise focus had not even been able to achieve a situation where it was possible to be certain as to what was likely to confront the firm in the near future. This failure he suggested, raised the "large question" of whether the focus of the scientific manager had to be expanded beyond the level of the enterprise.

Can the planning which has proved to be effective in coordinating the departments of the individual enterprise be established on a plane on which enterprises are but departments of one integral social enterprise? Is it possible to formulate a social budget through which government operations are so administered as to effect regulation of the total of individual enterprises (Person 1928, 1)?

The Taylorists' concern with this much wider notion of management was also a manifestation of their growing interest in the European rationalisation movement (Person 1927, 391-393). Of this latter movement Person observed subsequently that while the rationalisers had focused initially on the macro economy they had come to embrace issues that had traditionally concerned the scientific management movement. At the same time the scientific managers had been concomitantly expanding their notions of what were the limits of scientific management.

Starting from opposite poles scientific management and rationalization are apparently moving each toward the other. With a background of experience with state socialism, the latter thought first in terms of socially controlled reorganization of all industry and then of scientific management of the particular situation. Scientific management, on the other hand, with its background of extreme individualism, started with the problem

of the individual plant, then proceeded to application of its principles and technique to the management of groups of plants under one ownership. Socially it has developed the concept of voluntary trade standardization. Ultimately, although probably still with individualistic bias, it may in America come to be applied to the organization and control of entire industries and all industry (Person 1929, 15-16).

The paper on demand management presented at the December 1927 convention was by H.B. Brougham of the Pollak foundation for Economic Research. Brougham's paper, 'Must Prosperity Be Planned?', examined the question of whether effective demand could be adapted, controlled and graduated in line with the increased capacity of industry. He began by criticising Hoover's waste study observing that the latter had advised that the stabilisation of production required that productive capacity be based upon the careful study of existing demand. This advice, he asserted, was the perspective of the individual who sought merely to plan for the enterprise. One who wished to plan for the nation, conversely, must adopt a very different approach seeking not to stabilise production but to constantly expand output and to facilitate this process by ensuring that there was adequate purchasing power in the market. In short: "Normal demand should be based on a careful study of productive capacity, and should be steadily increased as capacity to produce increases" (Brougham 1928, 2).

Brougham observed that if the general purchasing power of consumers could not be increased in line with the increased productive capacity of the nation it would be impossible to avoid periodic economic recessions. Drawing upon Douglas's paper on the movement of real wages he asserted that the fact that the incomes of workers had increased dramatically since 1921 was a critical factor contributing to the economic

prosperity the nation was experiencing. He observed, however, the number of wage earners enjoying this new found prosperity was a matter of concern. The Census of Manufactures had shown that between 1919 and 1925, a period during which the population had grown by 12 per cent, the number of wage earners in manufacturing had decreased by seven per cent. Brougham refused to embrace Douglas' easy dismissal of the declining number of wage workers and urged the members of the Taylor Society to give consideration to the effect of this phenomena on effective demand. He conceded that thus far there had not occurred a crisis of overproduction but suggested that this was primarily because of the vast increase in bank credit created by the "easy money" policies that had been followed by the Federal Reserve Board since 1922. Aware that it was not possible for the banks to continuously expand credit Brougham suggested the answer lay in the creation, at a federal level, of a department of management engineering whose purpose would be to manage the economy. It would do so by expanding investments in "non-productive assets" such as public buildings and parks when there was excessive capacity within industry and would pay for this investment by increasing taxes at those times when there was excessive demand.

The second paper at the December 1927 convention expressing concern with developments in the economy was presented by the industrialist Henry Williams. The key point made by Williams was that while managers tended to support the notion that the payment of high wages was to be applauded, with few exceptions they remained as obdurate as ever in their opposition to high wages within their own enterprises. He called therefore for the Taylor Society to give serious consideration to how the conflict between the immediate interests of managers and the interests of industry

and indeed society as a whole might be overcome.

In the discussion that followed the presentation of the papers by Brougham and Williams there were differences as regards the best means of dealing with the demand problem with some unconvinced there was any serious need for concern. Moreover, amongst those who were clearly perturbed there were differences as to the respective role that should be accorded the individual firm and the state. Indeed, there was even disagreement amongst those who accepted the need for the macroeconomic planning of demand. Thus Rexford Tugwell (1928, 19) criticised the notion that the planning of demand could be undertaken effectively within a capitalist economy observing that planning "in a larger sense, is, in a free system of enterprise, very nearly an anomaly."

These differences continued to be reflected in the *BTS* in the period through to the end of 1929 with the perspective of the optimists tending to predominate. Indeed, even after the "unpleasantness associated with the quotation factory at the corner of Broad and Wall Streets", as the statistician R.W. Burgess described the stock market crash, many Society members appear to have remained optimistic as regards the future. Asked to analyse the results of Hoover's *Recent Economic Changes* study Burgess concluded that the "economic forces at work in the United States are in the main well balanced resulting in a very satisfactory background for vigorous enterprise" (Burgess 1929, 239).

The divergent response to his paper, however, made clear the growing divisions within the Society. George Soule was especially critical of the emphasis Burgess placed on the voluntary involvement of employers in the implementation of stabilisation strategies. He also criticised the fact that Hoover's report had suggested employers were widely embracing the wisdom of the economy of high wages. Soule

observed that the available data showed this simply not the case and insisted that there was a growing disparity between the nation's capacity to produce and its ability to consume brought on by the fact that productivity growth was outstripping the growth of wages. Whereas in 1925 he had accepted Douglas's claim that workers' incomes were keeping up with productivity growth he now observed that "the increase in wage earnings has nowhere paralleled the increase in the productivity of industry" (Soule 1929, 250). The voluntary approach to demand management was a failure, he concluded, and it was imperative that some alternative way be found to ensure the real income of workers was increased in line with industry's increasing productivity.

We cannot keep up production unless consumption is adequately increased to absorb that production, and consumption cannot be increased unless the wage earners, who form such a large part of the public, have increased purchasing power But the increase in wage earnings has nowhere paralleled the increase in the productivity of industry (Soule 1929, 249-250).

Soule in turn was criticised for his contribution by those monetarists at the convention who were associated with Irving Fisher. The latter were particularly incensed at his suggestion that the trade unions and the anti-trust laws should be strengthened in order to ensure the rewards of the enhanced productivity growth were not hoarded by a small minority of the population (Meeker 1929, 251) His concern, however, appears to have been shared by others as is indicated by the fact that the Program Committee of the Taylor Society had invited Wesley C. Mitchell, the Director of the National Bureau of Economic Research, to present a paper to the December 1929 convention on the issue of market stabilisation. More specifically, Mitchell was asked by the

Society to answer the question "Are there practicable steps toward an industrial equilibrium?" In his reply Mitchell noted that the Committee which had sponsored *Recent Economic Changes* was convinced the prosperity of American industry could be sustained only if a balance between the economic forces within the economy was maintained. The Committee was also convinced that this would occur only if it was possible to "develop a technique of balance" (Mitchell 1930, 4). Mitchell noted economic theory generally accepted that capitalist economies tend to gravitate in the direction of equilibrium even if they never attain this state. The "theorist" therefore believed there was no need to develop a new technique of balance because it already existed as an inherent part of the market system. However, said theorist also acknowledged that "real life commercial demand and supply" were not based on adequate knowledge and that in this area there was "plenty of room for improvement" (Mitchell 1930, 4). One "subtle problem" that especially needed to be confronted in this regard was how to disseminate the knowledge required to ensure there was adequate demand within the economy. He noted approvingly that at that very moment in Washington, Hoover was gathering together the major economic interests of the nation in order to undertake, on a national scale, a step of "great technical interest". This was the President's attempt to induce the major industrialists to agree to maintain wages and prices in order to avoid the collapse into depression. Mitchell called upon the managers of the Taylor Society to not only support this national effort but to strive to take further steps within industry that would contribute towards industrial equilibrium.

Mitchell's observation that the Taylor Society should support Hoover's efforts in Washington was given overwhelming endorsement. The Society passed a formal

motion that both supported Hoover and called for an even greater role for the state in the management of the economy (Taylor Society 1929, 253). Indeed, the more interventionist participants at the convention went further than Mitchell probably intended. Stuart Chase (1930, 9), who in 1926 had published a book *The Tragedy of Waste* which lauded the contribution of the scientific management to the heightening of industrial efficiency, for example, urged Society members both to study the experiments being conducted by the Soviet economic planners and to support the establishment of an "economic general staff" which would advise on economic policy both at the national and regional level.

The need for a more interventionist and regulatory state was also argued by Leonard Kuvin of the Index Number Institute who insisted that the most important element in what he saw was a looming economic crisis was the "impeded growth in the standard of living". Strategies to deal with the "chronic condition" into which the economy was collapsing, he observed, "must deal effectively with the inability of consumers to acquire for use the goods which they are so instrumental in producing" (Kuvin 1930, 13). In support of his claim that there was a "disharmony between the forces of production and the forces of consumption", Kuvin provided data from the Bureau of the Census that revealed the extent to which the productive capacity of US industry was underutilised. He also provided evidence that wage earners were receiving a decreasing proportion of the nation's output and suggested this development was especially worrying because employers were utilising the funds that should have been paid to labour to further expand their capacity to produce.

The consequence of these development was a "vicious circle of excess capacity and limited demand" a situation

which, he insisted, had reached a stage where it could not be penetrated in a simple fashion. He observed that at the present time two methods were being put into operation under the leadership of Hoover. One was psychological involving the inducement of confidence amongst the nation's industrialists and the other was the reduction in taxes and the increase in funds for public works. What was really required, however, was some means of increasing wages and reducing the prices of commodities and it was America's lack of any such device that was the key element inducing the existing crisis. Consequently, America must develop on a national scale an effective method of credit regulation and control which would systematically expand credit to those industries underequipped and curb temporarily the availability of credit to those that were overequipped. If this could be achieved, Kuvin concluded, the "chronic disproportion between productive and consumptive capacities" would be overcome and America "be one step nearer the practical achievement of a program of industrial equilibrium" (Kuvin 1930, 15).

Hoover's valiant attempt to halt the oncoming depression by coordinating the price and wage policies of the major industrialists and by limited deficit spending has been well documented by Barber (1985). The President sadly, proved incapable of breaking with the stabilisation policies he had helped to develop through the early and middle years of the 1920s even when the growing magnitude of the crisis made clear the inadequacy of these policies. As a consequence of Hoover's refusal to embrace a more radical, statist program the leaders of the Taylor Society turned to the Democratic Party and to Roosevelt. Indeed, many Taylorists played a major role in the development and implementation of the policies associated of the Roosevelt Administration. These included Justice Louis Brandeis—the individual who coined

the term scientific management; Stuart Chase who did the same for the New Deal; Rexford Tugwell who became one of the most influential members of Roosevelt's Brains Trust; Henry Dennison and Lincoln Filene who largely constituted the liberal wing of the Administration's Business Advisory Council and Morris Cooke, a man whom Soule (1967, 128) reports was the primary architect of the "most successful and the most celebrated of all the projects undertaken under the New Deal"—the Tennessee Valley Authority.

In his analysis of Hoover and his policies, Barber cites Tugwell to the effect that the New Dealers owed much to Hoover especially as regards his enlargement of the knowledge available to those who would seek to extend the visible hand. He notes that Tugwell readily acknowledged that the brains trust got much of its material from the Hoover Committees or from the work done under their auspices. Barber (1985, 194) concludes his book by quoting Tugwell's observation that: "The Hundred Days was the breaking of a dam rather than the conjuring out of nowhere of a river". It is most appropriate to bring this paper towards a conclusion by citing Tugwell shortly before the dam burst as to what he believed had fed this river. In 1932, in an address to the American Economics Association Tugwell observed:

If we have been watching, describing, analysing industry as we should, we must have known that the greatest economic event of the nineteenth century occurred when Frederick W. Taylor first held a stop watch on the movements of a group of shovelers in the plant of the Midvale Steel Company The forces which were to make the future went unnoticed. The world is paying now for this dogmatic dream of the economists If we had had eyes to see the implications of Taylor's work we should have known that the vast expansion of production which must follow would

clog all the old channels of trade, swamp the mechanisms of an artificially limited commerce, and end in a period of violent reconstruction. Some of the sufferings of the present might possibly have been avoided. We failed to understand because our eyes were blind to the technology which was revolutionizing the materials of our science (Tugwell 1932: 87).

CONCLUSION

This paper has sought to add to the literature produced by the revisionist historians who have challenged the notion that scientific management was primarily an anti-worker labour control strategy. By utilising a largely unexplored primary source, *The Bulletin of the Taylor Society*, it has been possible to sketch the manner by which the stabilisation policies of the scientific managers matured in the years through to 1930. In the *BTS* there is a clear evolutionary expansion in the thinking of the Taylorists. Beginning by concentrating on the development of stabilisation practices at the workshop level they came to focus in time on the whole firm and finally became convinced that an effective stabilisation program must embrace all levels of the economic environment.

We believe that by revealing the extent and nature of the Taylorists' involvement with the issue of market stabilisation we have been able to uncover another dimension of their work. We have also furthered explanation of why the labour movement in the United States came to collaborate with the scientific management movement in the interwar years. This is an all but impossible phenomena to explain if one remains confined within the narrow Braverman/labour-process view of scientific management. However, it is possible to understand if a broader evaluation of this movement is accepted. With this broader perspective it is not difficult to

perceive how it could be that while organised labour might remain suspicious and even hostile towards some of the practices of the Taylorists they would be attracted to analysts who sought to develop programs that provided workers not only with higher wages and reduced working hours but also with greater job security.

In her 1989 reevaluation of the work of the scientific managers in the area of public administration, Schachter urged the need for analysts who seek to understand the scientific management movement to cease relying solely on text books and secondary literature. Sadly, this is advice which analysts in the areas of industrial relations and labour history appear extremely reluctant to heed. In the literature which seeks to appraise the nature of the movement it is common to come across articles, books and even Ph.D.s in which authors fail to cite the movement's main journal and base their explanations of the nature of scientific management on secondary literature with perhaps a partial reading of Taylor thrown in for good measure. The ignoring of such primary data as the Taylor Society's journal, we suggest, is not only poor scholarship it is also unjust. The scientific managers deserve better treatment.

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