

COMMENTARY ON FREUDENBERGER AND GREEN

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I

The question Professor Freudenberger places at the forefront of his research is one that is difficult to answer. What are the factors, other than technology, that determined the organizational pattern of production in the period of England's industrial revolution? This question has gone largely unanswered because it is difficult to answer definitively. It is much more difficult to answer, for instance, than the more common question of what technological factors determined the organizational pattern. In tracing technological factors we look for such concrete developments as the use of power-operated machinery. The factors beyond technology may involve items only indirectly measurable; e.g., an increase in necessary fixed investment, improvement in quantity of goods produced, a rise or fall in cost of raw materials, or new requirements for higher skill. All these are difficult to assess in any definitive way.

But Professor Freudenberger shows us that although he did not yet find all he hoped for, on this specific question, he did find other treasure. His experience reminds me of the contrast one economist drew between work in pure theory or theory testing as opposed to more empirically oriented exploration. In testing a theory we know what kind of facts we need to uncover and what hypothesis we want to confirm or refute. We are in the position of a race horse that is to go around on a race track. He can use blinders to good advantage because his objective is known and narrow. Not so with a burro, who is to take us down Grand Canyon where the path must be sought carefully and boulders avoided. In recognizing the value of the McConnell and Kennedy records on taxes and on insurance, Professor Freudenberger has shown his receptivity to valuable data that came to light as he proceeded.

The increase in capital investment at McConnell and Kennedy is reflected in the asset value of the second partnership which rose from £1,600 in 1795 to £40,000 in 1803 and reached £88,000 in 1811.

A technical factor is cited in the development from a "protofactory" to the factory proper. This factor is the increase in number of spindles on the mules that reached a point at which power operation was necessary. The transition was directly from hand operation to steam power. I think most of us have pictured the typical development as one from man power possibly to horsepower, or to water power, and only then to steam. The direct transition from hand power to steam power reflects the mechanical aptitude and know-how Kennedy must have had. From my studies of American manufacturing I am aware that the need for an engineer to operate and repair the steam engine played a part in delaying use of steam power. In Connecticut the partners of the Scovill enterprise seriously considered installing a steam engine but decided against this because they understood a skilled engineer was needed to operate an engine.

The division of managerial duties as between McConnell and Kennedy is suggested in a very concrete way. McConnell undertook overall management. Kennedy had general charge of the construction, and I presume repair of machinery.

The divergence in depreciation rates between 10% on machinery and 2 1/2% on houses may correspond to the difference in expected life. Professor Freudenberger indicates this divergence was reflected in data for 1813 when the income tax was in effect. From my own studies in the U.S., when the income tax was introduced, I am inclined to wonder what depreciation guide lines the English government laid down in connection with the income tax.

The fragmentary evidence of an inside contract system is most suggestive. For any of you who are not altogether familiar with the forms this took in its comparable development in America I would refer you to Professor Harold Williamson's Winchester - The Gun that Won the West.

Professor Freudenberger's recapitulation of the innovation and ready imitation of other's innovation at this firm, in the Schumpeterian sense, is helpful. But in fact some of the innovations came by degrees not in one fell swoop. The first steam engine was indeed 16 horse power, it cost some £800, and it involved an early application to textile spinning. Prior to that major change, however, the increase in number of spindles on the mules, and the setting up of mules back to back, came gradually. In my own research I have found difficulty using the Schumpeter model specifically because

significant improvements often came by degrees. It would seem to me that this was also often the case at McConnel and Kennedy.

The additional light on procurement and marketing, as well as that on insurance opens vistas that call for further exploration. I am fascinated by what Professor Freudenberg has found so far, and I am sure we all wish him success in further developing such critically significant information on the business history aspects of England's industrial revolution.

II

Mr. Green's task in reporting to us today is markedly different from the tasks of historians reporting on business in times long past. The contrast is clear between the task of Professor Freudenberg and that of Mr. Green. Professor Freudenberg had available only fragments of information from which to develop a description of management decision-making a century and a half ago. He was compelled to search for data from which to infer management procedures that were historically significant. Mr. Green's task is in a sense the converse. He knows more than he can tell us in his time limits concerning his specific examples of "Seeking New Markets". He has sought to select, and report to us, that information which may prove to be significant in the perspective of history; information which will be meaningful to the historian writing about the 1970's in the year 2000.

The Pullman family of companies, with which Mr. Green is affiliated, have only a minimal stake in exporting products. What they have to export, Mr. Green tells us, is know-how and can-do. The various divisions of Pullman have exported such know-how to the European countries, to South American and to Canada. In most cases they have licensed companies abroad to use their processes. In some cases the various Pullman companies have also assumed an equity position in overseas enterprises that were set up to use this know-how.

The export of know-how by U.S. companies is regarded as particularly important at this time, by Mr. Green, because our commodity balance of trade has recently moved to a deficit position after some three-fourths of a century in which this was a surplus. Mr. Green points out that for much of that period the United States made "large scale exports of mass-produced manufactured goods and farm products and commodities". In recent years, I might add, our manufactured goods exports

came to include research-intensive goods such as machinery, communication equipment, advanced aircraft and computers. Paralleling this recent shift in the composition of our exports, aggregate figures on our payments balance in the 1960's revealed that the yearly royalties on American-owned patents used by other nationals amounted to some ten times the yearly royalties on foreign-owned patents used by Americans. Thus, the export of know-how by American business firms and the licensing of foreign firms that use American know-how, in the way Mr. Green has described, has been and can be a constructive force in correcting the deficit in our balance of payments.

Mr. Green has pointed to the enterprise and initiative necessary for American leadership in manufacturing and technology. A study issued in 1965 by the Organization for Economic Cooperation and Development compared the manpower and other resources devoted to research and development in the U.S., in Western Europe and in the U.S.S.R. On an expenditure basis the U.S. effort was estimated at three times that of Western Europe. On a basis corrected for differences in research costs the U.S. effort was still some two times the effort in Western Europe.¹

The problem of "Seeking New Markets," as developed by Mr. Green, has an additional historical dimension in terms of public policy. For the past quarter century, he points out, our government has decreed an Eleventh Commandment: "Thou shalt not deal with one half the world's people". The economic counterpart of the cold war included a U.S. requirement for export licenses for export to communist countries of a wide range of research-intensive goods if they were related to defense. Trade with mainland China was altogether prohibited. The American policy was continued even in the face of exports from Europe and from Japan, to the communist countries, of goods and services similar to those our business firms were able and anxious to sell.

The Swindell-Dressler firm is one of the Pullman family. The specific problems faced by Swindell-Dressler in winning award of the contract for design of the Kama River truck Foundry in the U.S.S.R., make interesting business history. President Morfee's report, as recounted by Mr. Green, ought to be put on the record in the form of oral history. The task involved negotiation concerning features of the design, also concerning the manner of payment with credits or a return flow of goods such as ores and minerals, natural gas, lumber and pulp. Furthermore, the American exporter was required to

obtain export licenses for necessary equipment. Perhaps our public policy may have seemed to be mercantilism in reverse. A policy of discouraging sales. Perhaps the U.S. policy, and the emerging change Mr. Green anticipates as possibly related to the President's visits to China and his forthcoming visit to the U.S.S.R., reflect the close linkage between the government's economic and political objectives in the international field.

The Swindell-Dressler Kama River foundry contract, in any case, does suggest a particular kind of progress in "Seeking New Markets". We are grateful to Mr. Green for the insight he has given us.

Footnote

¹C. Freeman and A. Young, The Research and Development Effort, Paris, Organization for Economic Co-operation and Development, 1965.