

. . . Both Big Steel and Small Steel contributed to the development of the oxygen steelmaking process, each one in its proper role; small works played the role as pilot plants whereas Big Steel contributed effectively to the improvement of the raw material supply . . .⁴

VII. CONCLUSIONS

The premise of United States technological backwardness on which Adams and Dirlam's analysis is based, is not supported by the statistical record of this industry. The analysis made by Adams and Dirlam does not take into account technological and economic complications faced by the industry's decisionmakers. Adams and Dirlam's calculation of profit opportunities "lost" by the United States industry is based on unrealistic assumptions. They would require: 88 per cent of United States output in oxygen steel at a time when the whole world had capacity to produce 4 per cent of its output by the process; United States OC output alone in 1960 at a level not reached by the whole world until 1965.

In light of the information presented in this article, United States producers do not appear "ignorant" nor their actions "ironic." Whoever the innovator's were in the United States, they were of sufficient size and importance to allow the United States industry to keep pace with overall world performance in OC steelmaking, despite some significant disadvantages which the industry faced.

Even if the data had supported Adams and Dirlam's premise, there would be grave question about the conclusions they have drawn with respect to Schumpeter's hypothesis which Adams and Dirlam paraphrase as:

Large firms with substantial market power have both greater incentives and more ample resources for research and innovation.

We note that the requirements are "large" size and "substantial" market power. Also there is no requirement that the *opportunity* for innovation be *accepted* by all for Schumpeter's hypothesis to be consistent with the data.

Adams and Dirlam appear to force their analysis. The basic innovator, VOEST, is dismissed as "tiny" in absolute terms; yet, it is a virtual monopolist in its home market and has state financial backing. United States firms which are large in absolute size are designated by their *relative* ranking in the United States market (innovating Jones & Laughlin with close to \$1 billion sales in 1965, is "only fourth"). Investigation of McLouth, first United States

4. Letter, *op. cit.*, p. 5.