Scrap Rate. Today the maximum scrap rate commercially possible with LD converters is about 30 per cent; general practice is to use no more than 25 per cent scrap in the converter charge. Initially very little scrap could be used.[3] By comparison OH furnaces are usually charged with 50 per cent scrap in United States practice and 65 per cent scrap in European practice. The Thomas process, widely used with high-phosphorous iron for some lower quality steels in Europe, has a scrap rate of roughly 10 per cent. The United States is a surplus producer of low cost scrap while Europe, outside West Germany, has been a scrap deficit area.

Smaller scrap using capacity implies a higher hot metal charge to the steel furnace (a situation faced if U.S. or European producers shift from the open hearth to the LD). For a balanced, integrated plant a rise in hot metal requirements implies a need for additional blast furnace capacity for the same final product output. A relatively larger scrap using capacity (Europeans shifting from Thomas steel to the LD) implies the ability to expand steel output without new blast furnace capacity — but, of course, requiring proportionately more steel rolling and finishing capacity.

Maximum Batch Size. The LD converter has experienced a rapid scaling-up over its lifetime in the first five years (see page 465). The first Jones & Laughlin converters in 1957 represented a significant innovation and were the largest in the world in batch size and annual output.[4] Kaiser's 110-ton converters took both honors when they were put into production in 1958.

Though even the 35-ton converters had large *annual* capacity (both they and Thomas converters have tap-to-tap times of less than one hour), the batch size itself is a crucial factor in an integrated plant. Ladles, cranes, transportation and handling equipment, etc., all must be in harmony for such installations. It is very inefficient to place 30 tons of steel in a ladle designed for 175 tons and transport it by cranes capable of 200 tons, for example. Euro-

using the process *will be* as low or lower than those of conventional steel making methods." Emphasis added.

3. The early LD's were not capable of utilizing even the amount of scrap generated *within* the plant, so called "home scrap." The Kaldo Process was (and is) capable of utilizing a higher proportion of scrap, but is a more complicated process. The economic analysis of its differences from other OC processes is important, difficult, and continues today.

4. The announced batch size for these converters was first 55 tons, then 65. When put in operation, they produced about 82 tons per heat. The rerating from 55 to 65 tons proportionally raised the stated annual capacity of these converters; however, the increase in heat size from 65 to 80-plus tons involved no change in annual capacity; the larger heat merely took proportionally longer to blow; 55 vs. 39 minutes per heat. (Madsen, January 1959, p. 23.)