

HEADQUARTERS
U.S. STRATEGIC BOMBING SURVEY
(PACIFIC)
APO #234
C/O POSTMASTER, SAN FRANCISCO

INTERROGATION NO. 297
(Obtain from G-2)

PLACE TOKYO
DATE 2 Nov 45

Division of Origin Capital Equipment & Construction

Subject: Interview with Abrasives Industry Representatives.

Personnel interrogated and background of each:

Mr. AKIYAMA, -- Director of Grain Abrasives Control Ass'n since 1944.
Mr. KISHIMOTO -- Member of Grain Abrasives Control Ass'n.
Mr. YAMAJI, T. -- Director of Grinding Wheel Control Ass'n since 1944.

Where interviewed Mitsukoshi Department Store.

Interrogator Lt. Farley; Lt(jg) Gorham

Interpreter Lt.(jg) Gorham

Allied Officers Present None.

Summary:

The interview covered the wartime history of the Japanese abrasives industry, the location and concentration of plants, material and labor problems, difficulties in maintaining quality, and susceptibility of the industry to air attack. The industry apparently was a weak spot in the economy, more through its inability to achieve adequate quality than through lack of volume. The large number of firms of fairly uniform size, spread over the nation, suggest that the industry would not have been a fruitful target.

8 November 1945

ABRASIVE INDUSTRY

Personnel Interrogated:

Mr. AKIYAMA -- Director of Grain Abrasives Control Ass'n since 1944; before that, since 1940, chief director of Grain Abrasives Manufacturers Association; before that an employee of Tokyo Electric Company.

Mr. KISHIMOTO, Hajime -- Member of Grain Abrasives Control Association.

Mr. YAMAJI, T. -- Director of Grinding Wheel Control Ass'n since 1944; before that official in Nippon Toki Kaisha, largest Japanese grinding wheel firm, a pre-war china-ware factory.

Interrogator: Lt. Farley; Lt.(jg) Gorham.

Interpreter: Lt.(jg) Gorham.

Data Presented:

Mr. AKIYAMA had prepared (for delivery in finished form 5 November 45) a history of the Japanese grain abrasives industry; a list (in order of importance) of the plants; an account of the air raid damage to the industry; production data from 1940 to 1945.

Mr. YAMAJI had prepared for us a table of the plants in the grinding wheel industry, grouped by areas, showing location, capacity and production in 1944; and those damaged.

A. Japanese Raw Abrasives Industry

After a temporary development during World War I, the Japanese raw abrasives industry (alundum and carborundum producers) almost died out for over a decade; grinding wheel manufacture was carried on with material imported from the United States or Korea. At the end of the 1930's, increased

demand attendant on general industrial expansion brought a considerable number of small producers into the field. Though inefficient, these firms balanced declining imports and prepared the industry for the period when it was forced to rely on itself and the Korean plant (which produced about 2000 tons of alundum annually at the end of the war). Because of this background, no stockpiles of raw abrasives had been built up before the outbreak of the war. Natural abrasives were not important in Japan industrially; they were used almost exclusively by farmhands, carpenters, etc.

In 1940, a manufacturers Association was established to tackle the problems of increasing the volume and efficiency of production. No formal official pressure was brought on small or inefficient firms to merge with larger firms or sell out, but a fixed-price policy was established by November 1940 that effectively froze out these marginal producers. Only after this stage in organization of the industry was the Association legalized, in 1941. It became a Control Association in 1943.

After the period of rationalization, around the time of the outbreak of war, the industry was concentrated in fourteen firms of one plant each, fairly well dispersed over the homeland and adapted to the pattern of industrial development. Many of the firms, though running only one abrasives plant, were general electro-chemical firms with other plants manufacturing other chemical products. In expanding production, new plants were not built; expansion took place in existing plants. The Korean plant was the only wartime source of imports of consequence; abrasives were actually exported to Manchuria.

At the time of expansion, quality (which had never been high by American or German standards) fell off, because of inferior materials and the drive to put out as much grain as possible. The Association tried to meet the problem by instituting a grading program in 1941, to which the price system was adjusted.

In 1943, it was recognized for the first time that the raw abrasives industry was critical to Japanese production plans. The industry had continually fallen behind the demands of grinding wheel manufacturers; not only was raw abrasives a newer industry, but it was in addition the one that felt the pinch of raw materials shortages sooner than grinding wheel manufacture. Eighty percent of the output of raw abrasives went to grinding wheel firms; the rest went to users of loose

abrasives and to makers of coated abrasives. The deficiency in raw abrasives had to be met by crushing old grinding wheels and reprocessing the grain thus obtained.

The general organizational measures of the Control Association, after it had been given authority over material and orders allocation in 1943, were accompanied by a rise in output to the all-time peak of just over 24,000 tons in 1943. Material shortages, however, caused a drop in production of white alundum, the raw abrasive of highest quality. A large increase was planned for 1944, but the necessary alumina was grabbed by the aircraft industry, and only 4000 tons of white alundum were produced; even this amount was not of the best quality, since inferior materials had to be used --- slag, for example. (The Japanese industry was never furnished bauxite directly, though it used what alumina it could get from what was not taken by the aircraft industry. Aluminous shale was very satisfactory, however, for the same reason that made it less desired by alumina processors -- the iron content, which reduced the amount of silicon in the raw abrasive.)

Despite the shortages of raw material, there was in 1943 and 1944 a tendency for ingots to pile up at some plants in excess of crushing capacity. The cause was the industry's inability to obtain allotments of steel and alloys to repair and maintain the crushers; the backlog of orders rose as high as 300 tons of ingots on one plant in early 1944. Only after prolonged negotiations by the Control Association with the Munitions Ministry, Army, and Navy was the necessary material for repair of equipment allocated in April 1944.

By January, 1945, the first effects of the bombardments were felt in delayed delivery of materials. By the spring of 1945, transportation was making it difficult to ship output; and in addition the general attempt at dispersal of war industries was confusing shipments. Actual productive capacity of the industry does not fall essentially -- damage was slight -- but interference with materials, transport, and labor, and equipment difficulties combined to cause a drop of rate of production to 20% of capacity by June 1945. No organized dispersal program for the raw abrasives industry was contemplated; it was clearly not a precision target, its plants were usually not in the heart of urban areas, and the fall in demand accompanied the drop in output or even outstripped it.

B. Japanese Grinding Wheel Industry

In 1945 the Japanese grinding wheel industry consisted of 75 plants, 51 specializing in manufacture of vitrified wheels and 24 in manufacture of elastic wheels. Total capacity was rated at 33 thousand metric tons, just over 90% of which was in vitrified wheels. Production in 1944 was 22,870 tons, or two-thirds of capacity; production in 1945 was only 5,400 tons. Damage in area raids had reduced capacity by over 6,000 tons by the end of the war, but 1945 output was still only one-fifth of capacity, and the rate of production was lower still by July and August 1945.

The 15 largest plants, or one-fifth of the plants, had two-thirds of the industry's capacity. There was less geographical concentration, however, with production centers at Nagoya, Osaka-Kobe-Kyoto, Kure-Hiroshima, and to a smaller extent Tokyo and Fukuoka. In addition to this separation, the plants were in general not in the cities, but on the outskirts and hence less exposed to area attacks. The plants all specialized in making grinding wheels and belonged to independent companies in general. Three of the five largest plants, including the largest plant with a fifth of the industry's capacity, had been converted from china, procelain tile, and fire brick manufacture around 1940; the chief equipment is common to both industries -- kilns -- even though materials are different. This largest plant (Nippon Toki Kaisha), and the sixth largest (Toho Taishi, at Kyoto), used tunnel kilns; the other plants used periodic kilns. The fourth largest plant, Hiroshima Seitoshu, at Hiroshima, was set up by the American firm, Norton, and is considered by the Control Association to be perhaps the makers of the best wheels.

The industry just before the war had about 350 factories. Under authority of the Ministry of Commerce and Industry, the Manufacturers Association carried out a rationalization program; the principle used was the elimination of all plants with less than four kilns. Production at this time was about half of the 1944 peak, or just about 10,000 tons. Mr. YAMAJI claimed that this figure represented the bulk of Japan's consumption at this time; though he did not have import-export figures, he asserted that import of grain abrasives and wheels combined was only at a yearly rate of 1000 tons. (Source for fuller data would have to be the Ministry of Commerce and Industry.) Exports were trivial; early in the war, some wheels were exported to Manchuria, but a small grinding wheel plant was set up there in 1942-43 which satisfied demand.

The Grinding Wheel TOSEIKAI was set up in 1944. Its functions were to furnish information of capacity to a board of Army, Navy, Air Forces, and Munitions Ministry representatives who planned the forthcoming year's production; and to allocate materials to plants on the basis of this plan. Aside from the constant shortage of grain abrasives, the greatest material difficulty was with coal, which had to be obtained from a distributing agency which at first did not recognize the importance of the grinding wheel industry and was only convinced by the protestations of the aircraft industry. Binding materials for vitrified wheels, lead for the centers, and other materials were short periodically, in part through difficulty in getting allocations and in part through transportation holdups. Skilled workers were not a problem in this industry, which required no specialized skills, but workers were hard to keep. About 30% of the industry's 10,000 workers were women.

After several plants had been hit in raids, a dispersal was planned. The largest plant was ordered to move from the Nagoya area to Korea, but at the end of the war only a few pieces of equipment had been sent. A couple of Tokyo plants also had prepared to disperse. Raid damage affected the buildings of plants exclusively; kilns were not destroyed, even at HIROSHIMA.

The chief user industry was the aircraft industry, which took roughly 50% of the output (perhaps more). Other users in approximate order of importance were machinery and tools, motor vehicles, bearings, and munitions firms. In peacetime, agricultural and lumbering machinery were also important users. The chief complaint of these users during the war was not of a shortage of wheels, but of the quality of those supplied; the Grinding Wheel Association asserted that their problem was inferior materials.

(ADDENDUM: The total capitalization of the industry was 40 million yen; the value of the output is to be computed by multiplying the tonnage figures by 4,000 yen, the average value of a ton of wheels.)