McGILL UNIVERSITY

Department of Civil Engineering—Testing Laboratory

INDENTATION TEST

Date.—February 15th, 1906. *Name of Observer.*—H. K. D.

Specimen.—80 lb. steel rail from Grand Trunk Railway Co. Broken while in place on line.

Indenter.—Sphere .75" D. *Machine used.*—Wicksteed.

Method of Test.—Indentations made on top and bottom.

LOAD (Lbs.)	INDENTATION (Inches)	DIAMETER OF INDENT AT SURFACE OF SPECIMEN (Inches)	AREA OF INDENT AT SURFACE OF SPECIMEN (Sq. Inches)	HARDNESS FACTOR H (Lbs. per Sq. Inch)	REMARKS
60,000	.057				Bottom
	.057				"
	.055				Top
	.056	.425	.1418	427,000	"
80,000	.075				"
	.075				"
	.077				Bottom
	.079	.490	.1885	427,000	"
100,000	.101				Top
	.102				"
	.103				Bottom
	.103	.545	.2332	432,000	"

Although this may reasonably be termed an exceptionally close coincidence, yet an indentation test made on this specimen in the shops would have given a value of hardness factor to at least suggest the presence of a rather higher percentage of carbon than would be desired, or a condition equivalent to such, in regard to the other elements.

It is believed that Brinell, of Sweden, was the first to investigate this method of testing iron and steel, having published a paper on the subject about five years ago.

His term of "Hardness number" was obtained by dividing the area of the concave surface of the indent into the load instead of the area of the projection.

He also obtained the yield point and percent elongation by separate experiments, rather than direct reference to the hardness factor as herein attempted.

According to him no method purporting to determine hardness is to be considered suitable for practical use unless fulfilling the following requirements: