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O T T A W A

September 21st, 1942.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1303.

(Subsequent to Report of Investiga-  
tion No. 1270 - August 12th, 1942.)

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Examination of Two  
Ram Tank Volute Springs.

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Ram Tank Volute Springs.

Origin of Samples:

On September 9th, 1942, Prof. J. U. MacEwan, Consultant to Director of Metallurgy, Army Engineering Design Branch, Department of Munitions and Supply, Ottawa, Ontario, submitted two Ram Tank volute springs for a continuation of the investigation covered in Report No. 1270 (August 12th, 1942).

One spring was as received, while the other had been recarburized in a patented salt bath mixture.

Object of Study:

An investigation of the hardness and microstructure was desired in order that the worth of the two springs might be appraised.

Physical Examination:

A transverse section of the third coil (counting from the inside) of each spring was removed and polished. Figures 1 and 2 illustrate graphically the hardness along and across these two segments.

Microstructures:

The polished specimens were etched in a 4 per cent solution of picric acid in alcohol. Figure 3 shows the "as received" spring to be severely decarburized. The recarburized case on the re-heat-treated spring is illustrated in Figure 4.

Discussion of Results:

The "as received" spring, besides being too soft, has all the evils inherent in a decarburized surface. The recarburizing treatment given the other spring was effective, but the quenching medium lacked the agitation necessary to harden the inner coils successfully.

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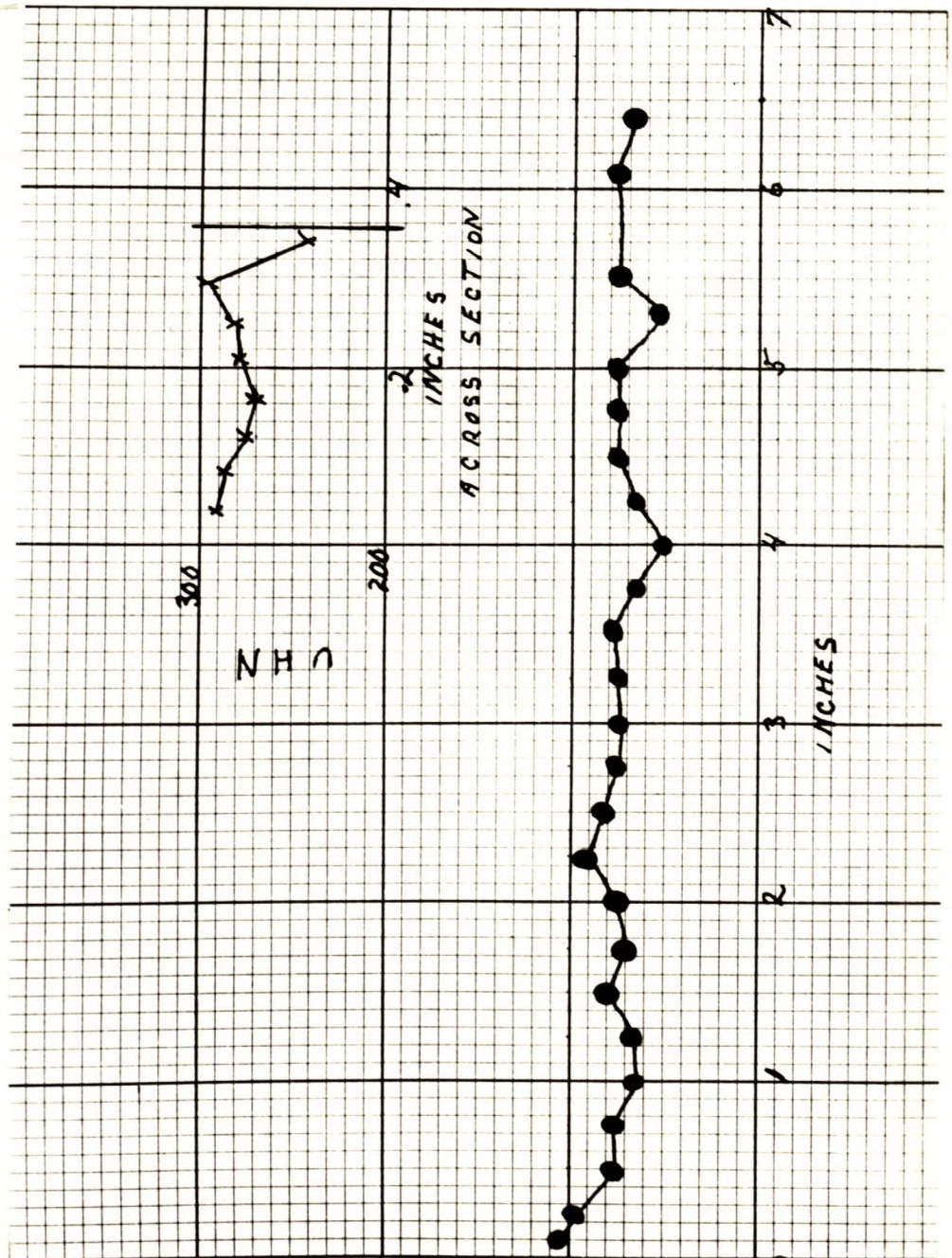
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(Pages 3 and 4 are charts)  
(Page 5 contains Figures 3 and 4)

Figure 1.

RAM TANK SPRING HARDNESS ON  
TRANSVERSE CROSS-SECTION OF RE-CARBURIZED  
SAMPLE

3rd COIL



VICKERS HARDNESS NUMBER

400

300

200

RAM TANK SPRING HARDNESS ON TRANSVERSE CROSS-SECTION OF  
SAMPLE "AS RECEIVED"

3rd COIL

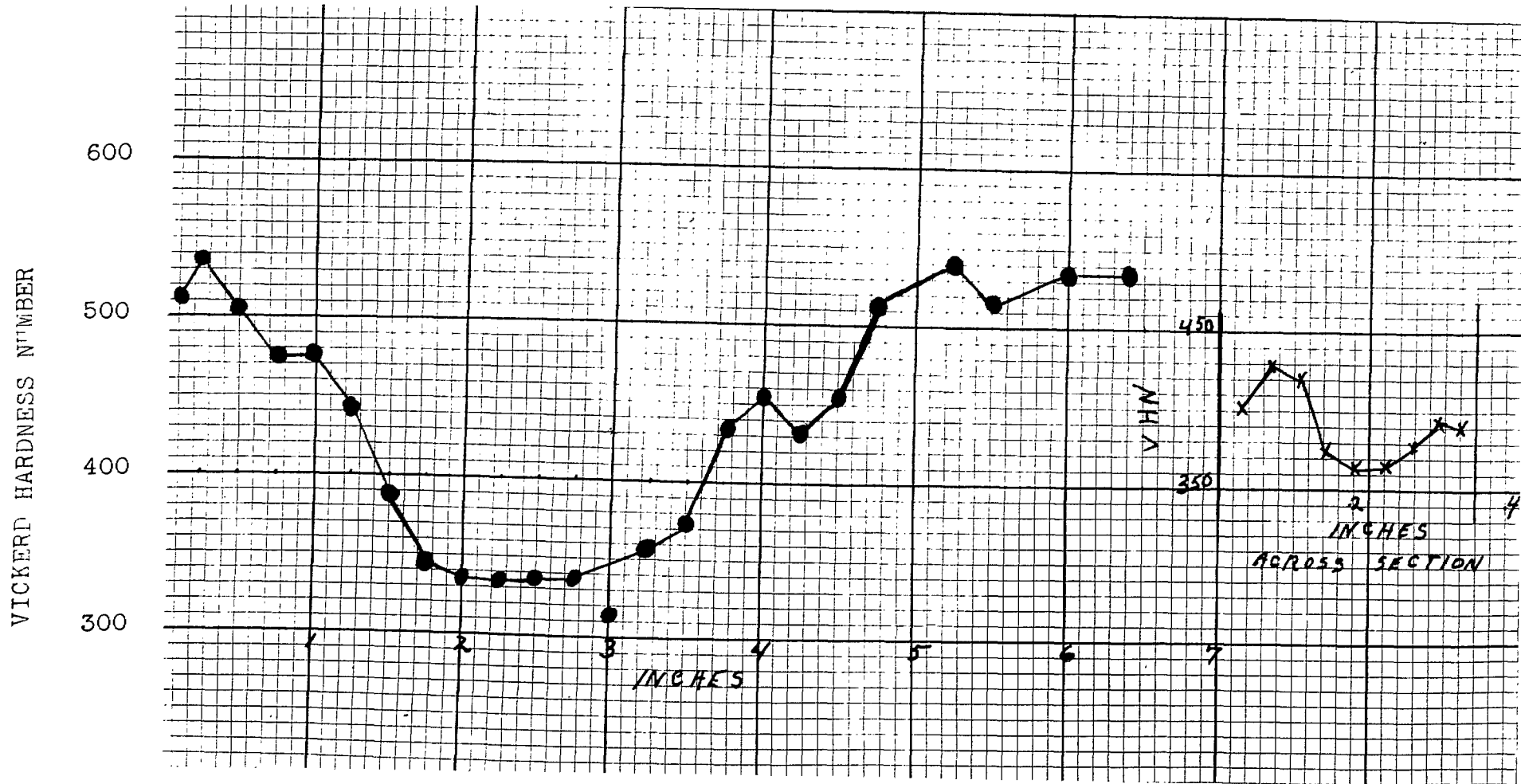
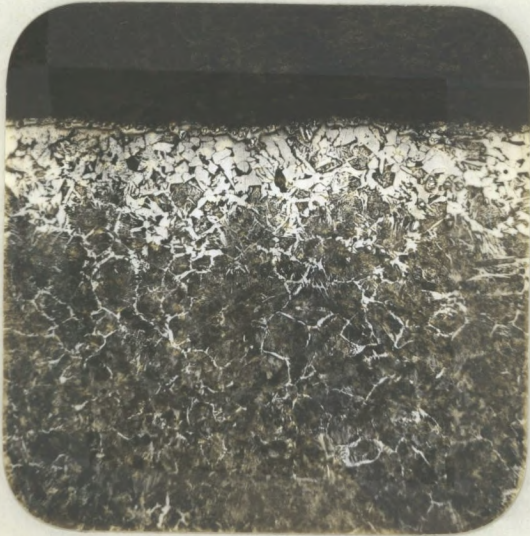


Figure 2.

Figure 3.



X100, picral etch.

DECARBURIZED  
SURFACE.

Figure 4.



X100, picral etch.

RECARBURIZED  
SURFACE.

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