73. *On the Change of Temperature and Magnetic Induction of Steel in Tension and Compression Test.*

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The experiments were carried out to observe the heat evolution or absorption, and change of magnetic induction lines of initially magnetised or demagnetised carbon steel when they undergo elastic or plastic deformation, and in conjunction with the above-mentioned observations, the deformation due to either tension or compression has been measured with great accuracy. From the experimental results obtained, it may be remarked as follows :

1) There occurs a minimum point of temperature in tension test and a noticeable point of change of temperature-slope in compression test, during the transition from the elastic to the plastic state.

2) In the results of tension test, the magnetic induction lines are increased in elastic state due to the earth magnetic field and this is just opposite to the case of compression test.

3) In the both tension and compression test, the magnetic induction lines are decreased in plastic state.

4) There is no appreciable change of magnetic induction during the compression of test piece having no initial permanent magnetism.

5) The "Y"-point in curves (C.F. Fig. 1 & 2), the so-called yield point follows after the reach of maximum point of magnetic induction line.

The present research is of special interest as opening a convenient means to investigate the yield point of material and though our knowledge of the elastic limit is still vague, a fresh light might be thrown by these new methods. The authors are convinced that the study of other metals in this line is to be highly recommended.

Fig. 1.

Fig. 2.