At the request of the British Association, Mr. Eaton Hodgkinson examined the mechanical properties of hot and cold-blast iron. The following are his general results.

Carron Iron, No. 2.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Cold-Blast** | **Hot-Blast.** | **Ratio represent­ing Cold Blast by 1000.** | |
| Tensile strength in |  |  |  |  |
| lbs. per square inch | 16683 (2) | 13505 (3) | 000 : 809 |  |
| Compressive ditto |  |  |  |  |
| in lbs. per inch from castings torn asunder.... | 106375(3) | 108540 (∙2) | 1000: 1020 |  |
| Do. from prisms of various forms | 100631(4) | 100738 (2) | 1000 : 1001 | Mean 99. |
| Do. from cylinders j | 125403(13) | 121685(13) | 1000 : 970 |  |
| Transverse |  |  |  |  |
| strength from all the experiments | (11) | (13) | 1000: 991 |  |
| Power to resist impact | (9) | <») | 1000: 1005 |  |
| Transverse |  |  |  |  |
| strength of bars one inch square in lbs | 476 (3) | 463(3) | 1000: 973 |  |
| Ultimate deflection of do. in in. Modulus of elasticity | 1·313 (3) | 1∙337(3) | 1000 : 1018 |  |
| in lbs. per square inch | 17270500(2) | 16085000(2) | 1000 : 931 |  |
| Specific gravity | 7066 | 7046 | 1000: 997 |  |
| Devon Iron, No. 3. | | | | |
| Tensile strength.... |  | 21907(1)  145435 (4) |  |  |
| Compressive ditto |  |  |  |
|  |  |  |
| Transverse ditto |
| from the experiments | *(5)* | *(5)* | 1000 : 1417 |  |
| generally |  |  |  |
| Power to resist | (4) | (4) | 1000 : 2786 |  |
| Transverse |  |  |  |  |
| strength of bars one inch square | 448(2) | 537 (8) | 1000: 1199 |  |
| Ultimate defiection ditto | ·79(2) | l∙09(2) | 1000: 1380 | |
| Modulus of elasticity ditto | 22907700 (2) | 22473650 (2) | 1000 : 981 |  |
| Specific gravity | 7295(4) | 7229(2) | 1000 : 991 |  |
| Buffery Iron, No. 1. | | | | |
| Tensile strength | 17466 (1) | 13434(1) | 1000 : 769 | |
| Compressive ditto.. | 93366(4) | 86897 (4) | 1000: 925 | |
| Transverse ditto.... |  | (5) | 1000: 981 |  |
| Power to resist |  |  |  |
| (2) | (2) | 1000 : 963 | |
| impact |  |  |  |  |
| Transverse |  |  |  |  |
| strength of bars | 463(3) | 436 (3) | 1000: 94’2 | |
| one inch square.  Ultimate defiection do |  |  |  |  |
| 1·55(3) | 1∙64(3) | 1000: 1058 | |
| Modulus of elas­ticity ditto | 15381200(2) | 13730500(2) | 1000 : 893 | |
| Specific gravity | 7079 | 6998 | 1000 : 989 |  |
| Coed-Talon Iron, No. 2. | | | | |
| Tensile strength... | 18855(2) | 16676(2) | 1000 : 884 | |
| Compressive ditto.. | 81770(4) | 82739(4) | 1000: 1012 | |
| Specific gravity | 6955(4) | 6968(3) | 1000 .∙ 1002 | |

Carron Iron, No. 3.

|  |  |  |
| --- | --- | --- |
|  | **Cold-Blast.** | **Ratio representing Cold Blast by 1000.** |
| Tensile strength .... Compressive ditto... Specific gravity | 14200(2)  115442(4)  7135(1) | 17755(2) 1000: 1250  133440(3) 1000: 1156  7056(1) 11000 : 989 |

“ Of the three columns of numbers in the table above, the first is the strength or other quality in the cold-blast iron ; the second is that in the hot-blast ; and the third is the ratio of these quantities.

“ The results in this table contain nearly the whole information re­lative to the question of hot and cold-blast-iron that the preceding re­search affords ; and before adverting to them, it may be mentioned, that it is usual for the makers of cast-iron to divide it. when taken from the furnace, into three classes, called Nos. 1, 2, 3, differing from each other in the appearance and qualities of the material. No. 1 con­tains the softest and richest irons, those which have the largest crys­tals; No. 3, the hardest and densest irone, those with the least crystals ; and No. 2, irons intermediate between the former two de­scriptions. Beginning with the No. 1 iron, of which we have a spe­cimen from the Buffery Iron-Works, a few miles from Birmingham, we find the cold-blast iron somewhat surpassing the hot-blast in all the following particulars; direct tensile strength, compressive strength, transverse strength, power to resist impact, modulus of elasticity or stiffness, specific gravity ; whilst the only numerical advantage pos­sessed by the hot-blast iron is, that it bends a little mote than the cold-blast before it breaks.

“ In the irons of the quality No. 2, the case seems in some degree different ; in these the advantages of the rival kinds seem to be more nearly balanced. They are still, however, rather in favour of the cold blast.

“ Referring to the No. 2 iron, from the Carron Works in Scot­land, we find the tensile, compressive, and transverse strengths, toge­ther with the modulus of elasticity and specific gravity, all higher in the cold-blast iron than the hot-blast, whilst the ultimate deflection and power of sustaining impact are greater in the hot-blast. The cold-blast iron is the better, but the difference is very small.

" In the iron No. 2, from the Coed-Talon Works in North Wales, the tensile strength is greater in the cold-blast than in the hot ; but the resistance to compression is higher in the latter than the former, and that is the case with the specific gravity.

“ So far as my experiments have proceeded, the irons of No. 1 have been deteriorated by the hot-blast ; those of No. 2 appear also to have been slightly injured by it ; while the irons of No. 3 seem to have benefited by its mollifying powers. the Carron iron No. 3, bot-blast, resists both tension and compression with considerably more energy than that made with the cold-blast ; and the No. 9 hot-blast iron from the Devon Works, in Scotland, is one of the strongest cast. iruns I have seen, whilst that made with the cold-blast is compara­tively weak, though its specific gravity is very high, and higher than in the hot. The extreme hardness of the cold-blast Devon iron above prevented many experiments that would otherwise have been made upon it, no tools being hard enough to form the specimens. The difference of strength in the Devon irons is peculiarly striking.

“ From the evidence here brought forward, it is rendered exceed­ingly probable that the introduction of a heated blast into the manu­facture of cast-iron has injured the softer irons, whilst it has fre­quently mollified and improved those of a harder nature ; and con­sidering the small deterioration that the irons of the quality No. 2 have sustained, and the apparent benefit to those of No. 3, together with the great saving effected by the heated blast, there seems good reason for the process becoming as general as it has done.” (c. a.)

SMITH, Sir Thomas, was born at Walden in Essex, in the year 1512. At fourteen he was sent to Queen’s College, Cambridge, where he distinguished himself so much, that ne was made Henry the Eighth’s scholar, together with John Chekc. He was chosen a fellow of his college in 1531, and appointed two years afterwards to read the public Greek lecture. The common mode of reading Greek at that time was very faulty, the same sound being given to the letters and diphthongs, *ι,* *η,* *υ*, *ει*, *oι*, *υι*. Smith and Cheke had been for some time sensible that this pronunciation was wrong ; and after a good deal of consultation and research, they agreed to introduce that mode of reading which pre­vails at present. Smith was lecturing on Aristotle *De*