

exactly the reverse, and as that of an iron on which dependence can be placed for all purposes where strength is required. The specimen showing a combination of large and small crystals, means that the iron is not uniform in quality, and that it needed further refinement. A fractured bar tells most every thing about the quality of iron, except that of uniformity, and it exhibits this at times, as in the case above illustrated. It so happened, in the assumed exposure of fracture, that the bar was broken at a point where it lacked uniformity, but if broken a few inches either side of this point, it might not have shown any coarse crystals. Good iron that has been insufficiently refined does not show its lack of uniformity throughout the whole length of a given bar, but in spots more or less frequent, and it is simply a matter of chance if one of these *raw* spots, as they are sometimes called, occurs at the point of fracture. If, now, instead of breaking the bars off short, we slightly nick them on one side and expose them to moderate blows, so as not to bend them too rapidly, fibre will be developed in the iron of good quality, while the poor coarse crystal iron may snap off short again, after very few blows. The higher the quality of the iron, or the nearer it approaches purity, the more soft and silky will be the exposed fibre. The phenomenon of fibre can be readily understood, when it is remembered that all iron, whether pure, good, bad or indifferent, is built up, as it were, from crystals, which crystals have different degrees of fineness, depending upon impurities and the mechanical manipu-