drill successfully at work on the Rand and several others being successfully introduced, so that the weakness does not lie with the drill, but with the means employed for ejecting the broken cuttings, which included hollow steel. The inference is that if these difficulties could be overcome we have ready to hand a man drill weighing from 50 to 70 pounds.

(2) The second deduction is: "That hollow steel is not at present recommended, the class of material used in its manufacture not being suitable. It is a high-priced article, but it appears to crystallize more rapidly than the cheaper solid steel, and gave more difficulty in tempering, which process, however, was carried out by smiths used to the cheaper material ordinarily employed." Progress is continually being made in the manufacture of hollow steel, and at the present moment I believe the first statement of No. 2 does not apply. Steel used in the bulk of the piston drills in use on the Rand carries about .6 per cent. carbon, and, though not as hard as it might be, can be carelessly heated and tempered by plunging. Already, however, as a result of the experiments carried on at the Robinson Deep, steel of .7 per cent. to .75 per cent. carbon is recommended for some work. Steel of this temper requires more careful heating and tempering, and it has long been known that the slap-dash save a penny a hundred in sharpening costs and send the steel below with the minimum amount of labour and trouble expended on it methods do not pay. Mr. Tom Johnson, in his report, indulges in some plain, but not too plain, speaking with regard to the methods in vogue. Until recently all hollow steel was high carbon steel with .7 per cent. and over, I believe, and such steel should be carefully heated and should have the temper drawn, as is done in the case of picks; and the adoption of these methods, though they might add a few white blacksmiths to shop staffs, would scarcely ruin the mines, as the saving in costs of cutting rocks would run them into thousands against an expenditure of hundreds. Every other progressive mining field I know of has proved this and acts on it. However, to-day steel makers are prepared to supply hollow steel of any temper required, and steel can be procured of .69 carbon exactly similar to that in use in piston drills. It is also stated that one manufacturer has a secret process somewhat similar to that employed in the manufacture of Mannesman piping.

At any rate, hollow steel in long lengths, with a hole as large as ¾-inch in 1¼-inch round steel, is now on the Rand, and holes have been bored with it by both piston and hammer drills on the surface, and experimental holes are now being drilled underground in a Rand mine. This steel per foot of length as used to make drill bits (jumpers) is cheaper than solid steel. The committee express themselves unfortunately in stating that hollow steel appears to crystallize more rapidly than the cheaper steel. What they might have written was that hollow steel was used in hammer drills and in them it tends to crystallize more than solid steel does in piston drills. As a matter of fact, steel used in either piston or hammer drills gives little trouble from this cause if it be annealed once a month. Boring with high air pressure in piston drills in shaft sinking in some of the hardest diabase on the Rand, I have seen solid steel of two carbon contents, owing to the intense vibration, crystallize so that I broke as many as 50 shanks with 12 rock drills in six hours, and the high carbon steel stood better. It is, however, true that the vibrations set up by hammer drills striking 1,000 to 1,500 blows per minute tend in hard ground to cause breakages from crystallization. This trouble has been increased from two causes.

The hammer drill manufacturers do not know that the real requirement of the Rand in the matter of a one-man drill is for a really simple light drill that the native can understand, and will like, which uses only 30.50 cube feet of air at 70 pounds pressure, and which will put down a 4-foot hole, starting with about 1⅜ in diameter and finishing about 1-inch. Now, whether such a drill puts down four, six or eight holes in one shift does not matter so much as the fact that such a machine would do the work of at least four natives, and do it better than they would, and relieve the labour shortage on the Rand and in Rhodesia, while at the same time stopes could be kept ready now and blasting with large charges, and using 6 or 7-foot holes, which are the conditions under which the present small piston stope drill works would be avoided. Hammer drill manufacturers strive to produce machines with a maximum boring speed. Though it is well known that one can get any boring speed one likes as long as the steel will stand (in other words, that the resisting power of the steel in any ground must be the determining factor in hammer drill design), it is amusing sometimes to note the rival claims for boring speed among the various manufacturers, and as soon as one maker produces a machine that will bore, say, upper holes at a reasonable speed, another introduces a machine that delivers a heavier or more rapid stroke on the plea that it will bore faster. Under such conditions one must expect that the resisting powers of the long-suffering drill steel must soon be severely tested, and a return be made to machines designed to drill at the highest economical rate consistent with the size of steel used in them and the air pressure and hardness of the ground.

Tin Corners on the London Metal Exchauge

(Translated from the "Cologne Gazette" of June 13.)

During the past year we have frequently had occasion to call attention to the movements in the price of tin, and especially during the last few days to the present unsatisfactory state of affairs. A small group of financially strong speculators, who already at the beginning of last year successfully forced up prices, have now succeeded by withholding supplies in effecting a corner in tin, which began in February and now reaches its highest point this month. In February, 1911, the price of three months' tin was on an average about £187 10s., whereas the cash price was £190 3s. The difference between the cash and three months' quotations remained about the same during March and April, but in May it reached £10, then £19, and on the 9th June even £42. Cash tin was paid for at up to £233, whereas the quotation for three months was only £191. At the present moment tin for prompt delivery is quoted at £231, and for delivery in three months £190. The possibility of bringing about a condition of affairs so extremely harmful to regular business, and the temptation to such manœuvres lies in the tin contract adopted by the London Metal Exchange.

The determining factor as to whether tin may be delivered against contracts is not its quality, but its origin; that is to say, tin must be produced in the