LXXXIV. *A Letter from the Rev.* William Henry, *D. D. to the Right Honourable the Lord* Cadogan, *F. R. S. concerning the* Copper-Springs *in the County of* Wicklow *in* Ireland *

My Lord, Ann-ſtreet, Dublin, Apr. 18, 1752.

Read June 18, 1752. HAVING, in my progreſs to viſit the charter-ſchools, paſſed by the rich copper-mines in the county of Wicklow, I judge, that it will not be unacceptable to your lordſhip to receive ſome account of them.

Theſe mines lie in the ſouthern part of the county of Wicklow, upon the river Arklow, on each ſide of that river, and about ſeven miles weſtward from the town of that name, among hills, that riſe to the height of ſmall mountains.

The mine, which was formerly wrought on, is that of Ballymurtogh, on the ſouth bank of the river. It yielded vaſt profit to the undertakers; but, on account of ſome difference between Mr. Whalley and the company, it has been diſuſed for ſome years paſt.

This is amply compenſated by the far richer mines of Crone-Bawn (in Latin *Corona alba*) on the north ſide of this river.

Crone-

* An account of ſprings of the ſame kind in Hungary may be ſeen in Dr. Edward Brown's *Travels*, p. 68, 69, edit. 1685, fol. Count Marſigli's *Danubius Pannonico-Myſicus*, tom. III. p. 25. and Matthius Belius's *Notitia Hungaria*, tom. II. p. 393, 394. There is publiſhed, in the *Giornale de Letterati d' Italia*, tom. XXVII. Art. IV. p. 186, *& ſeq.* a ſecond letter of Signor Agoſtino Soderini, of Venice, relating to the art of metallurgy, in which he deſcribes the method of changing iron into copper by vitriol.

Crone-Bawn is an hill of two miles in circumference, and, as near as I can gueſs, about 1000 feet in height, ſwelling regularly in the form of a large inverted bowl. The bowels of this hill are, on all ſides, full of rich mines, as appears by the ſhafts, which have been ſunk in different parts of it. But the principal works lie on the eaſt ſide, about half way up the hill. Here I ſaw ſeveral ſhafts, ſunk from 50 to 70 fathoms deep, as the directors of the works informed me. In ſinking theſe ſhafts, the firſt mineral met with is an iron ſtone. Beneath this, they arrive at a lead ore, which ſeems mix'd with clay, yet yields a large quantity of lead, and ſome ſilver. Under this lies a rich rocky ſilver ore, which ſparkles brightly, and yields ſeventy-five ounces of pure ſilver out of a ton of ore, beſide a great quantity of fine lead.

Having pierced ſome fathoms thro' this, they arrive at the copper ore; which is very rich, and may be purſued to a vaſt depth.

There are five hundred men employed in theſe mines; and having inquired from ſeveral of them, how they could live in theſe caverns? they ſaid, that they had their health very well; and that there was a particular quality in the copper-water to cure, immediately, all ſores in their ſkin or fleſh. Their pay is eight pence a day.

In order to carry off the water from the mines, there are levels carried on a great way under-ground, from the lower part of the hill. Out of theſe levels iſſue largeſt reams of water, moſt ſtrongly impregnated with copper.

An accidental diſcovery, which happen'd not long ago, is like to make theſe ſtreams more beneficial than

than all the reſt of the mines. Some of the workmen, having left an iron ſhovel in the ſtream, found it ſome weeks after incruſted with copper, inſomuch that they thought it converted into copper. This gave the hint of laying bars of iron in theſe ſtreams, which is done in the following manner:

Oblong pits are dug, ten feet long, four wide, and eight deep: the bottom laid with ſmooth flags; the ſides built up with ſtone and lime, with wooden rude beams acroſs the pits to lay the iron bars on. Chains of theſe pits are continued along the ſtream, as far as the directors pleaſe; for the water never abates of its quality, if it were convey'd from pit to pit thro' a thouſand. Soon after the iron bars are laid in theſe pits, they contract a copper ruſt, which, by degrees, intirely eats away the iron. The copper, which is in the water, being thus continually attracted and fixed by the iron, ſubſides to the bottom of the pit. To haſten this diſſolution, the iron bars are ſometimes taken up, and the ruſt rubb'd off them into the pit. In the ſpace of twelve months the whole bar is commonly diſſolved, if the iron be ſoft; for ſteel or hard iron will not do here. The ſtream is then turn'd off the pits; and the men with ſhovels throw up the copper, which lies on the flag at the bottom, like reddiſh mud. This mud, being laid in an heap, and as ſoon as dry, becomes a reddiſh duſt; of which I ſend your lordſhip an ounce, that I took up on the ſpot. It is then ſmelted into copper.

This being the apparatus, the product is thus. One ton of iron in bars produces a ton and 19 hundred and an half weight of this copper mud or duſt. Each ton of this mud produces, when ſmelted, 16 hundred

hundred weight of the pureſt copper, which ſells at ten pounds *per* ton more than the copper, which is made of the ore. There are about 500 tons of iron now laid in theſe pits; and the proprietors may, with proportionable advantage, lay in many thouſands.

The water, that runs from theſe mines, enters the river Arklow on New Bridge; and is of ſo corroſive a nature, that no fiſh can live in this large river from hence to the ſea.

If your lordſhip thinks theſe accounts worth notice, you may communicate them to ſuch of your friends, and other curious perſons, as you pleaſe.

I am, with the ſincereſt reſpect,

Your lordſhip's moſt obedient,

and moſt humble ſervant,

William Henry.

LXXXV. *Extract of a Letter to Dr.* Maty, *F. R. S. from* Geneva, *concerning the Introduction and Succeſs of* Inoculation *in that City.*

Read June 18, 1752. IN September 1750, the practice of inoculating the ſmall-pox was firſt introduced into Geneva. The example was ſet by a young lady; and was, the next year, follow'd in the hoſpital of foundlings, where it was admitted by an order of the governors, and authorized by the magiſtrates.