survey of Scotland was interrupted for a number of years, and the scene of operations transferred to Ireland, an accu­rate survey of that country being considered, from political reasons, as of more urgent importance.

The Ordnance survey of Ireland is perhaps the most complete operation of the kind that has ever been exe­cuted in any country. Hitherto the different bases of ve­rification had all been measured with the same apparatus, and according to the same methods, as were used on Houn­slow Heath ; but doubts having arisen respecting the accu­racy attainable by means of the steel chains, Colonel Colby, on entering upon this new field, resolved to have recourse to an entirely different method of proceeding, and, instead of chains, to adopt the ingenious compensating apparatus which has been described in Figure of τηε Earth, p. 553. By this method, metallic bars of ten feet in length, and defined by points whose distance remains invariable in all temperatures, are placed accurately along the line to be measured ; and the distance between the terminal points of the preceding and following bars is measured by a mi­crometer microscope, with a certainty altogether unattain­able by measuring rods abutting against each other, or by observing the coincidence of straight lines on the handles of the steel chains. The ground selected for the base lies on the east shore of Lough Foyle, on the north coast of Ireland, and the line itself forms part of a straight line drawn from Shaw Mountain to Mount Sandy, nearly north and south. The whole line measured was nearly eight miles in length. For a verification, it was divided into two parts, one about half the length of the other, and the length of the one deduced from the other in various ways by triangulation. By this means it was estimated that the greatest possible error could not exceed two inches. It was also prolonged by triangulation from the north end to Mount Sandy, whereby two additional miles were given to it, so that it may be considered as a base of ten miles, the probable accuracy of the last part being quite as great as that of the part determined by the actual application of the mea­suring bars. From this base a series of triangles com­menced, which proceeded all over the island, and were connected with those formerly observed in Wales, the Isle of Man, the west coast of Scotland, and the Hebrides. Some of these triangles were of enormous extent, the sides exceeding a hundred miles.

The survey of Ireland having been completed, at least so far as regards the primary triangles, that of Scotland was recommenced in 1838, and has already been carried from the eastern counties westward to the island of Lewis in the north. At the present time (1840), surveying parties are also employed at different places in Wales and the north of England, in observing the angles which had formerly been omitted, and verifying others which had not been satisfac­torily observed.

We cannot conclude this brief and imperfect sketch with­out alluding to the admirable maps which have been pub­lished from time to time, and are now in progress. These are all designed from the materials collected in the field, and are not only drawn, but also engraved and printed, at the Ordnance Map Offices in the Tower, and at Dublin. Of the maps of England, thirty-eight counties, embracing all the southern part of the island, have now been publish­ed, engraved on a scale of one inch to the mile. The maps of Ireland, of which eighteen counties arc publish­ed, are given on the magnificent scale of six inches to the mile, and not only exhibit, with the utmost distinctness, the natural features of the country, but even the minutest

topographical details. This series of maps forms a splendid national work ; and as no part of the map of Scotland has yet been engraved, we trust that the whole of that country will be given on the same scale.@@1

*Of the Standards of Length used in the Trigonometrical Surrey.*

In the British survey, all the linear measures are expressed in feet measured from a certain scale ; and in order that the results relative to the dimensions and figure of the earth may be comparable with those of other similar operations, it is necessary to determine the relation of this unit to other known measures.

General Roy’s measurement of the Hounslow Heath base was performed with glass rods, on which lengths of twenty feet had been set off by Ramsden, from a standard scale, which is described “ as a finely divided brass scale of the length of forty-two inches, with a Vernier’s division of 100 at one end and one of fifty at the other, whereby the thousandth part of an inch is perceptible. It was ori­ginally the property of Mr Graham, the celebrated watch­maker ; has the name of Jonathan Sisson engraved on it, but was known to be divided by Bird.” From this scale the measure was transferred to the glass rods as follows. A deal plank upwards of thirty feet long, nine or ten inches broad, and about three inches thick, was set up edgewise on stands, and planed perfectly straight and smooth. A silver wire was then stretched along the middle of the edge from one end to the other, and six distances of forty inches each were marked off by the side of the wire, at which points brass pins were driven into the wood, and their tops polished. A fine dot being then made on one of the ex­treme pins, and the silver wire being stretched over the dot and the middle of the other pins, the extent of forty inches was, with the utmost care, taken from the scale, by means of a pair of beam-compasses, whose micrometer screw shewed very perceptibly a motion of the 5000th part of an inch, and transferred to the following brass pin on the plank. In this manner all the six lengths were laid off. Two brass rectangular cheeks were then placed on the plank so as to bisect the two extreme dots, and present relatively to each other surfaces perfectly parallel. The glass rods were then placed between the cheeks, and the bell-metal buttons which formed their extremities ground down until the length (determined by the coincidence of a fine line on the glass rod with another on the moveable apparatus on the ex­tremity of the rod) was accurately fitted between the cheeks, and was consequently twenty feet of the brass scale.

The scale which it has been usual of late years to adopt in works of science as the standard of English measure, goes by the name of Sir George Shuckburgh’s scale, and is described at length in the Phil. Trans. for 1798. The relation between this scale and several other standards was investigated by Captain Kater, whose experiments and **re­**sults are given in the Phil. Trans. for 1821. From these experiments it was found that thirty-six inches of General Roy’s scale are equal to 36∙000930 inches of Sir George Shuckburgh’s; whence, in order to reduce distances ex­pressed in terms of General Roy’s scale to Sir George Shuckburgh’s, we must multiply by ∙9999742.

Now it has been stated that the length of the Hounslow Heath base, as measured by the glass rods, was found to be 27404∙98 feet. Using the above multiplier, the same distance expressed in terms of Shuckburgh’s scale is 27403∙38 feet.

@@@, From the "Estimates of the Office of Ordnance" for the year 1840-41, printed by order of the House of Commons, it appears that the sums of money already granted for the surveys of England, Wales, and Scotland, amount to L.326,163, and that the sum proposed to be taken in the present year is L.18,400. On the survey of Ireland there has been expended the large sum of L.619,520, including L.60,000 for the services of the present year. The number of persona employed on the Irish survey, at the date of the estimates, is stated to be 2037 ; and the number employed on the British survey 82.