of coal-tar colors; and, while this tar presents an attractive field for research, it is not of great value at present. On the other hand, the tar from the Simon-Carvès has a specific gravity of 1.20, is black and thick, rich in naphthaline and anthracine, contains benzine, toluine, xyline, and carbolic acid, and is free from paraffines. A good deal of benzol is supposed to be carried off and burned. Now, Mellor has recently patented a process for extracting benzol from gas by passing it up through an earthenware tower filled with broken glass moistened with nitric acid. Davis has also a process for refrigerating gases. Either of these processes, added to the present plant of the Simon-Carvès, would save valuable products for coal-tar colors.

It is generally the fate of new improvements, that some unforeseen difficulty stands in the way of immediate adoption. In this case the dilemma seems to be, that the iron-men say, give us beehive or Jameson coke and Simon-Carvès by-products, and we will embrace the improvement at once. But, while the Jameson coke is good, the by-products are not as yet of much value; and, while the Carvès by-products are valuable, the coke is not yet satisfactory. Improvements often are adopted partially, or in some modified form. So it appears to be in this case.

The furnaces at Gartscherrie, near Glasgow, Scotland, have for years been smelting with raw coal, allowing it to coke itself at the top of the furnace, thus losing all the by-products, and some of the coal itself. They have recently tried closing in the top of two of these furnaces, and conducting the furnace-gases through condensing-apparatus on the way to the boilers, hot-blast stoves, etc. They have been so much pleased with the result of the experiment, that they propose to apply the same improvement to the other eight furnaces. This arrangement will probably yield a much heavier oil than the Jameson oven, but perhaps not so heavy as the Simon-Carvès; and, as the coke is made within the furnace itself, it is hard to say just what its quality may be.

Report says that modified plans are being tried in still another way, and that the highly bituminous coals of Colorado are treated by a process of coking; and the derived gas is injected into the blast-furnace, and thus re-enforces the heat of the coke, which is mixed with the ore, as usual, and has thereby effected a reduction of 75% in the cost of the smelting.

R. H. RICHARDS.

THE FLORA OF LABRADOR.

THE list of the plants of Labrador published in the Proceedings of the U. S. national museum, vol. vi. pp. 126–137, is interesting as showing some facts of geographical distribution. Though the list makes no pretensions to being complete, still it may be considered that it represents the flora in a sufficiently complete form to allow inferences to be drawn from it.

There are enumerated, altogether, a hundred and sixty-one species and varieties. Of these, two, Ranunculus acris and Capsella bursa-pastoris, have been introduced from Europe. Of the hundred and fifty-nine left, a hundred, or nearly sixty-three per cent, are natives of Europe as well as of Labrador. Out of these hundred species, there are some having a more northern distribution than Labrador, and a few extend even to the Arctic circle. Many of them are marsh or swamp plants, or else live along the sea-coast. The flora, as a whole, is most decidedly northern in its character.

Of the fifty-nine species not known to Europe, it is found that thirty-eight have a range to the northward of the 49th parallel, and that only about four (viz., Fragaria Virginiana, Kalmia latifolia, K. angustifolia, and Alnus serrulata) can be considered as southern forms. Of these, the first is 'rather rare,' the two Kalmias are found in 'ravines and near ponds in the interior,' while the last is found 'in ravines' and along the seacoast. The northern aspect of the flora is further illustrated by the following facts:—

The Ericaceae, an order most abundant in cold climates, has seventeen species; Rosaceae has eighteen species, ten of them belonging to the northern genera Potentilla and Rubus; Caryophyllaceae has eleven species and varieties; while the Labiatae has not a single one, the Borraginaceae has only one, Scropulariaceae but two, and Compositae is sparsely represented by four.

This last seems an especially striking fact, and is in accordance with what we might expect. We know that the order is largely a tropical one, and that probably the heat of the summer months in Labrador is not sufficient, and not long enough continued, to enable the plants to flower and fruit. Of the Leguminosae, there are only five species, four of them being European also; and this order may be regarded as being in the same category as the Compositae.

In a former article (Indigenous plants common to Europe and the United States, *Journ. Cinc. soc. nat. hist.*, iv. p. 51), I have endeavored to show that we must look to the north as the place of origin of many of our plants; and when we find that sixty-three per cent of Labrador plants are also European, and twenty-three per cent have a high northern range, some extending to Alaska and Greenland, we see further reason for the assertion. That many of these plants were at one time distributed all around the Arctic circle, there can be no doubt; and that they have been driven from their first homes by the excessive cold, and found suitable abiding-places at the south, must also be considered as an established fact. The agent in this pushing-southward of northern forms may be regarded as the glacial period, when the presence of the immense mass of ice on the continent caused the flora to continue to retire farther and farther south as the cold became more and more intense: when it mitigated, many of the plants returned north, and established themselves as near as they could to their original homes.

JOS. F. JAMES.