There can be no doubt that the encouragement of Colonial produce would lead to an increase in British exports.

It is certainly not inconsistent with Free Trade principles to render the Custom House barrier as easily surmountable as possible, especially between members of the same family.

If England, by treaty with France and Spain, seeks to do so by express stipulations, it stands to reason she ought to extend at least the same privileges to those who are bound to her by the closest ties of nationality and blood,—indeed, a refusal to allow her children some preference is manifestly unjust and cruel, and, if persistently continued in, will have the effect eventually of producing separate and independent States, or in some cases annexation to other Powers, and in no case would this transpire so readily as in Canada, which borders on one of the greatest republics that ever existed—a republic which in every way so readily suits us.

We call attention to our series of illustrations, with full particulars for the constructing and fitting up of laboratories in schools where science is designed to be taught. Although chemistry is chiefly the object of the design, other branches of science may profit by the laboratory.

The whole arrangement and design will be found complete and thorough in detail, being an exact counterpart of the requirements of the South Kensington Science and Art Department, London.

For the benefit of educationalists we intend reviewing occasionally the operations of this department, and will give sample examination papers on various subjects, some of which will be profusely illustrated, and we trust same will be both interesting, instructive and beneficial to a large number of our readers.

FITTINGS FOR LABORATORIES.

The drawings referred to in this memorandum are issued for the guidance of Committees of Schools in fitting up working Laboratories.

They should not necessarily be followed implicitly in all details, but are intended to show the amount of accommodation which should be provided for students.

Plate I. Shows a working bench for 4 students, two working on each side. It will usually be found advisable to place it "end on" to a window, so that the students may have the light at the side. The benches may be made to accommodate 6 or 8 students instead of four; but in no case should the space for each student be made less than 3 ft. 6 in. x 2 ft. 3 in. For benches placed against the wall, the same pattern divided longitudinally down the middle will serve.

Each student will require about 6 or 8 feet run or shelving for re-agents. This should be provided in the way shown in the drawing, each student's re-agents being kept in a distinct set of shelves. It is desirable to enclose these with sliding doors in order to enable each set to be locked up, and to keep out dust, etc. These doors may be glazed or panelled with wood.

Gas should be laid on to each student's place, nozzles being provided for fixing flexible tubes and a jet light to each. A basin and water taps should be provided for every two students. These basins should be placed either on the benches between the students, or at the ends. Both arrangements are shown in the drawing. Two drawers should be provided for each student under the table top, and the space below should be fitted with shelves and enclosed with cupboard doors, which should be set back a few inches to allow of the students sitting to their work.

The waste pipes from the basins are shown, not connected directly with the drains, but discharging into stoneware receivers emptying by overflow. By this arrangement the risk of stoppage of the drain pipes by rubbish, or their corrosion by strong acids, is avoided; and mercury accidentally upset into the basins can be recovered. Under any circumstances, however, the waste pipes should be so placed as to be easily accessible for repair.

Plate II. Shows a niche, or closet, for work evolving noxious fumes. The number of these to be provided must depend upon circumstances; but probably one to about 6 students will be found sufficient. They should be placed against the wall and connected with proper flues in order to ensure the removal of the fumes. Air may be admitted into them by holes in the door or by a space under the door. The connection with the flue should be made with earthenware pipe, and should be so arranged that dirt or moisture from the flue should not be likely to fall into the closet. The gas jet provided for maintaining the draught should be formed of copper pipe, as iron becomes corroded and the scales are liable to fall into any preparation in the closet.

Plate III. Shows a hood for a Hofmann's combustion furnace. It may also be found useful for other operations, which, from the size of the apparatus employed, cannot be performed in the small closets. It should be provided with a flue for taking off the fumes evolved.

Plate IV. Is a sketch of a lecturer's table. This should be at least from 10 feet to 12 feet long and from 2 to 3 feet broad. It is important that the surface of the table should be level and flush, and free from any obstruction.

A lead-lined trough should be provided at one end, covered by a movable part of the table top. A small sink, covered by a hinged portion of the table top, should be provided for emptying and washing apparatus. Taps for the supply of gas or water for experiments conducted on the table should be fixed a few inches below the top, and holes should be made in the edge of the table, as indicated in the drawing, for passing the flexible tubes fixed to the taps, by which arrangement they are not so liable to be disturbed as if they were passed over the edge of the table. It is convenient also to have terminals from a battery fixed in a similar position; the battery itself being placed in a position where its fumes will not be a nuisance.

The table should be lighted by lights suspended over it; or, if this cannot be arranged, by standard lights fixed near the front edge of the table, and these should be screwed on to sockets so that they can be taken away when not required.

In the wall behind the table should be a closet, 4 or 5 feet long, enclosed with a glazed sash and ventilated by a flue in which the draught should be maintained by a gas jet.

Black boards should be fixed against the rest of the back wall and arrangements should be made for hanging diagrams on the wall.

It is convenient to have a draught pipe from the surface of the table so that operations may be performed, in view of the students, under a glass bell, the fumes evolved being removed by the pipe which should be in connection with a flue and should be closed with a plug when not required.

METALLURGY.

In most cases, comparatively small additions to the chemical laboratories, arranged and furnished in accordance with the above regulations, will enable Practical Metallurgy to be taught.

It is necessary that a wind furnace should be provided, and this furnace must be in connection with a flue at least 30 feet high. The furnace may be placed in a basement below the laboratory, but there is no objection, if space permits, to its being in the laboratory.

There must also be a muffle furnace capable of heating to bright redness a muffle at least 8 inches long, 4 inches wide, and 3 inches high; when there is an abundant supply of gas, gas muffle furnaces, such as are supplied by Fletcher, of Warrington, or Griffin, of London, may be adopted with advantage.

The muffle furnace should be in the laboratory, as it is also useful in conducting various chemical operations.

Plate V.—Shews a vertical section of an air furnace which may be employed for all operations conducted in crucibles. It must be in communication with a chimney at least 30 feet high. Several such furnaces may be connected with the same chimney by means of a hosizontal flue, but each furnace must be provided with a separate damper.

The internal portions of the furnace, most exposed to heat, are of firebrick and the admission of air is regulated by a register.

Plate VI.—Is a vertical section through a muffle furnace of the form and dimensions used in the Metallurgical Laboratory of the Royal School of Mines.