

THURSDAY, JANUARY 13, 1887

SCIENCE AND THE JUBILEE

II.

IN our article last week we referred to two directions in which the Jubilee memorial could in our opinion be made to fulfil functions of the highest importance which none of our existing institutions could take up, and we pointed out that one of them would be almost exclusively scientific.

The fact that so distinguished a man of science as Sir Frederick Abel has been appointed the organising secretary of the new institution amounts almost to an assurance that these possible high purposes will not be lost sight of. Sir Frederick Abel has proved himself to be not only a brilliant and patient investigator of new problems in science, but also one of those men whose indomitable energy and administrative power peculiarly fit him for a post in which sympathy with science in its highest aspects must be associated with a keen knowledge of and interest in affairs.

It is not merely a coincidence, but rather a sign of the times, that this week we refer in our columns to two other apparently distinct subjects, which in fact are most germane to the one we are discussing. The first is an article by Mr. Morris on the botanical federation of the West Indies, and the second is the recently issued Report of the Committee appointed by the Government to consider the question of the national science collections. Mr. Morris's article is connected with the proposed Jubilee memorial in this way: it shows that already, by the nature of things, the West India Islands are associating themselves with the mother country in things botanical, as, according to our view, all our colonies should in things scientific generally. The necessity, the thoroughness, and the economy which obviously must result from such an arrangement are well stated by Mr. Morris, than whom we know no higher authority. It should be a subject of pride to our men of science that, thanks to the broad views taken by three successive Directors of the Royal Gardens, Science is ahead of politics on a line where politics is bound to follow her; for the political federation of the West India Islands is a thing of the not very distant future. This reference to the West Indies induces us, almost compels us, to return for one moment to another matter touched on in our article last week. We then pointed out that topography, geology, and botany would not be the only arts of peace to which we need confine ourselves. Now, we are inclined to believe that any money which might be spent in federating the West Indies meteorologically by means of the telegraph, even if new cables had to be laid here and there, would be saved over and over again in twenty years by the protection afforded to shipping by forecasts during the hurricane season. Now, supposing such a system as this at work in one of the most interesting regions of the world from a meteorological point of view, and controlled, if need be, from the mother country, represented by the Meteorological Council, good would come all round; the Meteorological Council would gain a larger and closer view of the phenomena which it is its duty to study, and the federated colonies would obviously gain by the reduction in the yearly loss of life and capital.

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We now pass to the Report on the National Science Collections. The connection between this Report and the proposal for the Institute can be gathered from the following statements.

We showed in our last article that the Committee appointed by the Prince of Wales were driven to South Kensington for a site by stress of money, even supposing that South Kensington was the worst possible site that could be selected. Our opinion is that South Kensington is the best site that could be selected for any institution which is to be anything more than an expanded Chamber of Commerce or Mart. But, however this may be, the fact remains that the Institute buildings, if erected at all, will be erected at South Kensington. Further the building must have a frontage.

It will be gathered from the Report of the Government Committee on the Science Collections that it is proposed to house them, including the historical and other objects recently transferred from the Patent Museum, in a building to run from Prince's Gate to Queen's Gate, at the back of the Museum of Natural History. Now, why should not the Royal Commissioners and the Government arrange matters so as to enable the Science Museum, which thus must be geographically associated with the Institute, to be commenced at the same time? In this way, it appears to us that the Royal Commissioners would have fully discharged their functions as regards the southern part of the land for which they are trustees, provided always that the Institute is really to promote the progress of science and art.

One word now as to the real place of this Science Museum among our national institutions for the promotion of knowledge. The student of literature in this country—the man who has to make new books, or whose desire it is to obtain any of the knowledge contained in old ones—finds in the British Museum library and reading-room the most magnificent organisation to supply him with what he wants. In this respect the British citizen to-day is as well off as, but perhaps no better off than, the citizen of Alexandria was in olden times; and now, as then, it is conceded that it is the duty and glory of a State which makes any pretence to civilisation to have such an institution as this among its resources. It is one of the arsenals of peace.

Turn to another line of intellectual activity: take the student of the biological sciences. The British Museum of Natural History is a library no longer containing books merely, but things which have to be studied to obtain new knowledge. Here, as among the books, the student is allowed to examine, to study, to collate, and to describe without stint, microscopes and other apparatus being provided for him; facilities are afforded to him in order that he may learn, and that the field of knowledge may be enlarged through his labours.

Yet another region of activity: take Art in all its branches. Our National Gallery and the art collections at the British Museum and South Kensington show that

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in past times, at all events, the State has considered it its duty to bring together collections for the benefit of the student, and even for the delight of the eye of the uninformed.

These institutions are not merely depositories for loans, in which the State enables its citizens to be benefited provided only that the process costs nothing, or next to nothing; but fabulous sums have at times been given, and willingly given, by the nation in order that we shall not be behind others in the opportunities afforded of cultivating the arts of peace.

We now come to the newest developments of human activity. We leave the ground common to us and Greece and Rome, and we approach the modern world, the world which is as it is because physics and mechanics and chemistry have been developed since those earlier days to which we have referred. These developments form the glory of our modern civilisation, and are the pith and marrow of our national life.

What do we find in our national collections representing these in this our England, where till a few years ago physics, mechanics, and chemistry had been most, and most successfully, applied?

Nothing, or practically nothing. The State, which has absorbed greedily some two millions nett in patent fees which have come into its coffers in consequence of these developments, has given nothing, or practically nothing, back. It is true that the generosity of private individuals has enabled the nation to possess and exhibit some of the most interesting among the historical apparatus illustrating the applications of those branches of science to which we refer. It is true also that the Science and Art Department has done its best to make bricks without straw, and the state of things is better now than it was ten years ago. We say ten years ago, because it is about that period since the Duke of Devonshire's Commission pointed out in the clearest and most emphatic way this great and damaging gap in our national resources, and pointed out, too, the various evils which would arise from it. Since that time other Committees have reinforced the Commission's suggestions. Those who know best know how well for the country it would be if the modern developments of knowledge were illustrated as well as the older ones. It is true that after ten years the thing has gone so far that a Treasury Committee has been appointed to consider how such a national collection could be housed. But it is not impossible that another ten years may elapse before anything is done, unless some special and extraneous reason be urged for the doing of it.

Then why should not the men of science in this year of Jubilee urge upon the Government that it also should not be lacking in commemorating this year? If the citizens of Greater Britain contribute a quarter or half a million in commemorating the year, why should not the Government contribute some 25,000*l.* (as an instalment of 100,000*l.*, which is all such a Museum need cost) in starting an institution which all students of science or its applications know will be the most important of all in fifty years time, most important, that is, in everything that relates to the development of the resources of Greater Britain?

So much then for what the Government might well do in the year of Jubilee. It remains for us to consider what men of science as such can do. We believe that the keynote of what they can best do was struck by Prof. Huxley as President of the Royal Society. To this matter we shall probably take another opportunity of referring.

MARINE ENGINEERING

Die Schiffsmaschine; ihre Construction Wirkungsweise und Bedienung. Bearbeitet von Carl Busley. (Kiel: Verlag von Lipsius und Tischer, 1886.)

THE concluding volume of this important work on marine engineering equals in merit and style the portion previously published, of which a notice appeared in NATURE, vol. xxix. p. 426. It is a most laborious and well-digested compilation of all that is best worth preserving in relation to the resistance and propulsion of ships. The author with true German industry has sought far and wide for his materials, drawing from the writings of French, German, Dutch, American, and English authorities. But it may be stated with some satisfaction that the most recent and valuable investigations to which reference is made are those of our own countrymen. The labours of the late Mr. Scott Russell, Prof. Rankine, and Mr. W. E. Froude, have given an impulse and direction to the theoretical and experimental investigations of the problems of resistance and propulsion, of which the practical value cannot well be over-estimated. The action of the Admiralty in assisting the late Mr. Froude, and in now establishing, under the able direction of Mr. R. E. Froude, experimental works on an enlarged and permanent basis, has yielded substantial advantages to the Royal Navy, and benefited the science and practice of shipbuilding generally. One private firm on the Clyde has, for its own purposes, created a similar experimental establishment; another was established in Holland by the late Chief Constructor, Dr. Tideman; France has done something in the same direction; and Russia and the United States have given attention to the matter. Everywhere it is now recognised that the resistances of full-sized ships may be closely approximated to by means of experiments with models; and in this manner the problems of ever-increasing difficulty incidental to the attainment of higher and yet higher speeds are being dealt with confidently and successfully. Pure theory cannot master these problems, although it has suggested the best experimental procedure. The older theories of resistance summarised by Mr. Busley have given place to the "stream-line" theory, and upon it has been based the "law of comparison" between ships and models independently laid down by the great French teacher, M. Reech, and the late Mr. W. Froude.

Mr. Busley shows full appreciation of the value of these modern experimental methods, while he also describes the more or less "rule-of-thumb" methods which formerly prevailed and have still their uses. It is not possible for most shipbuilders and marine engineers to have model experiments for new ships, and they therefore depend largely upon the analysis of the results of speed trials made with other ships. Carefully conducted trials on what is