

THURSDAY, JULY 17, 1890

THE INDIAN CIVIL SERVICE AND THE INDIAN FOREST SERVICE COMPETITIONS.

THOSE who devote attention to educational questions are looking with interest for the publication of the new schedule for the Indian Civil Service competitions. But past experience of the Civil Service Commissioners, who are largely responsible for these matters, and on whom the various departments must chiefly rely for the carrying out of their ideas, causes the interest of many of us to be not unmixed with a considerable degree of anxiety lest there should be in this case a repetition of the recent Woolwich and Sandhurst *fiascos*. Therefore, notwithstanding the favourable character of Sir John Gorst's recent reply to Sir Henry Roscoe, we hope that those at the Universities who are interested in the question, and the leaders in science, will not yet rest upon their oars, but that they will bring under the direct notice of the authorities at the India Office the present position of science studies at the Universities and the views that are held there on this important subject, in order that the latter, who we believe hold fair views upon the subject, may be in a position to judge of the fitness of any scheme that may be submitted to them and of its correspondence or the reverse with the present condition of higher education. We bring this subject again under the notice of our readers, partly because of its importance, and partly because in the new regulations for the India Forest Service we have recently been afforded a fresh example of the inability of those who are officially intrusted with these matters to properly estimate the requirements of the public services. These new regulations are, no doubt, better than those which they are intended to replace in several respects, notably so in that the absurd list of fourteen compulsory subjects by which this examination has hitherto been distinguished has now been abolished, and also in that the examinations will now run somewhat closely on the lines of the army competition—a change which will probably secure for them a wider field of candidates than they have hitherto had. But, considered as a method of selecting those who are most likely to do good work in a scientific profession, the scheme must be pronounced to be a failure, since it will neither insure the selection of the most promising men for the particular service required of them, nor, as many will think, encourage those who intend to compete to give themselves a really liberal education.

The subjects and their mark values are as set out below :

<i>Class I.—Obligatory Subjects.</i>			Not less than one-third of full marks in each of these subjects must be obtained to qualify.
1. Mathematics, Elementary	...	2500	
2. English Composition	...	1000	
3. German	...	2000	
<i>Class II.—Optional Subjects.</i>			Any two, but not more than two, of these subjects may be selected.
4. Mathematics, Higher	...	2000	
5. French	...	2000	
6. Latin	...	2000	
7. Greek	...	2000	
8. English History	...	2000	
9. Botany	...	2000	
10. Chemistry	...	2000	
11. Physics	...	2000	
12. Physical Geography and Geology	...	2000	

Class III.—Additional Subjects.

- 13. Freehand Drawing ... 500
 - 14. Geometrical Drawing ... 300
- } Either or both of these may be taken up in addition to those in Classes I. and II.

A close inspection of the scheme reveals at once certain serious objections to it. In the first place, whilst admitting that the authorities have done well to provide fairer opportunities for students whose education has been largely in literature, we must claim, both in the interests of the service and of the candidates, that those who seek admission as probationers for so essentially scientific a service ought in every case to be required to show some moderate degree of capacity for scientific work before they are admitted to their professional studies. The Professors at Cooper's Hill are men of the highest standing, and they will undoubtedly give an excellent training to all who are fitted to undergo it. But they cannot create scientific aptitude in those who are intrusted to them. Hence, if men who are deficient in the proper qualities are selected as probationers, either the service or the probationers must suffer; for it must happen, either that the scientific standard of some of those who are finally selected will be unduly low, or else that some probationers who ought never to have been selected will be finally rejected after much loss of time and much expenditure in money. To show how real this objection to the scheme is, it is only necessary to point out that under the new scheme a candidate may offer himself for examination in the following subjects with every reason to hope for success:—Elementary mathematics, English composition, German, Latin, Greek, drawing. We do not think that the staunchest upholders of the study of literature will support this selection of subjects as one by means of which a satisfactory judgment of the fitness of the candidates for a scientific profession can be made. It is plain that a young man who shows ability in these subjects may or may not have a reasonable degree of scientific aptitude also.

On the other hand, many will think that the new scheme permits even too great a neglect of literary studies on the part of those candidates whose bent is for science, since several combinations such as the following would also be possible:—Elementary mathematics, English composition, German, chemistry, physics. We are sure that many advocates of science teaching will feel that in this group of subjects literature is too much neglected; and we believe that a youth of nineteen or thereabouts might add to it another modern language, or some knowledge of Latin, with advantage to his studies in mathematics and science, as well as to his general education.

In connection with this question, too, it must be remembered that candidates are practically compelled by the severity of these competitions to stick to those subjects in which they are most likely to compete successfully, for a long period, often for several years, beforehand. So that, for example, a young man who is only moderately good at science and rather better at languages will be most likely to win a place in this scientific service by neglecting all scientific reading up to the age of nineteen or twenty years! Surely this is an example of how not to do it!

It seems to us, therefore, that the proposed scheme for the India Forests Department imperatively requires

such amendment as shall secure evidence of a reasonable degree of capacity for science on the part of every probationer, whilst it would be well also if it could be made to encourage a rather wider range of literary study in the earlier education of those whose main interests lie in the direction of science. What is desirable could be attained in several ways. But it could, perhaps, be best effected by permitting candidates to offer themselves for examination in three subjects instead of two from Class II.; with the limiting condition that one at least of these three must be taken from numbers 5, 6, 7, 8, and one of them from 9, 10, 11, 12.

We trust that this subject may also be brought under the notice of the authorities at the India Office. It seems evident from the changes already made that they are in no way prejudiced against either scientific or literary studies, and we feel sure that if they will institute inquiries they will find that similar opinions to those we have expressed are widely held on this subject.

THE VOLCANOES OF HAWAII.

Characteristics of Volcanoes, with Contributions of Facts and Principles from the Hawaiian Islands: including a Historical Review of Hawaiian Volcanic Action for the past Sixty-seven Years, a Discussion of the Relations of Volcanic Islands to Deep-sea Topography, and a Chapter on Volcanic-Island Denudation. By James D. Dana. Illustrated by Maps of the Islands; a Bathymetric Map of the Atlantic and Pacific Oceans; and Views of Cones, Craters, a Lava-Cascade, a Lava-Fountain, &c. (London: Sampson Low, Marston, Searle, and Rivington, 1890.)

THE veteran geologist of the United States has rendered an inestimable service to science by the publication of this splendid monograph, which has just made its appearance simultaneously in this country and in the United States. To find any work on a similar subject comparable with it either in importance, or in the influence it is likely to exert upon geological thought, we must go back to the publication of Fouqué's "Santorin," of Von Waltershausen's "Etna," or Scrope's "Volcanoes of Central France."

The Hawaiian volcanoes are unquestionably the grandest on the face of the globe. Their vast dome-shaped masses, with slopes averaging from 6° to 8°, rise to heights of only 14,000 feet above the sea-level; but deep-sea soundings have shown that they stand on a floor 12,000 to 18,000 feet below that level, so that, as Prof. Dana points out, the higher volcanic mountains of the Sandwich Islands must have an elevation of not far from 31,000 feet above their bases! Beside these lofty and bulky domes, the graceful volcanic cones of the North and South American continents, of Japan and Java, sink into insignificance. The Hawaiian Archipelago contains no less than fifteen volcanoes of the first class, all but three of which appear to be now extinct. The active volcanoes of Hawaii give rise to lava-floods, which, in their bulk and in the distances they flow from their point of emission, are only surpassed by those of Iceland. In their remarkably non-explosive action, in the characters of their great pit-craters, in the wonderful liquidity of their lavas—giving rise to veritable fountains of molten rock—and in the beauty and singularity of some of their igneous products,

the Hawaiian volcanoes are without a parallel anywhere else in the world.

The Hawaiian volcanoes appear to form two nearly parallel bands, which doubtless indicate great lines of fissure in the earth's crust, the extreme length of these being about 400 miles. The recent topographical surveys of the islands made by Prof. W. D. Alexander, Surveyor-General to the Hawaiian Government, and a number of recent soundings in the adjoining seas, enable us to realize, in a way that was not previously possible, the dimensions and forms of these vast volcanic piles.

Prof. J. D. Dana has enjoyed exceptional facilities for studying these unique centres of igneous activity. As naturalist of the U.S. Exploring Expedition, he visited the islands in November 1840, after the great eruption of Kilauea that had taken place in May of the same year. The work of the actual survey and description of the craters was unfortunately not committed to Prof. Dana; for the energetic, though scientifically untrained, head of the Expedition, Captain Wilkes, determined to undertake this task himself; and the naturalist was sent away to another station while the survey was in progress. Had Prof. Dana been present to advise and assist the surveying officers, it is clear that many unfortunate errors would have been avoided, and that the accounts of the volcanoes contained in the "Narrative of the United States Exploring Expedition" would have had far greater scientific value.

After his return to the States and his settlement at Yale College, Prof. Dana showed his continued interest in the Hawaiian volcanoes, by keeping up a constant correspondence with missionaries and other residents in the islands; and every great eruption was carefully chronicled in the pages of the *American Journal of Science*, which he has so long edited. The memoirs of Brigham and Captain Dutton, and the enlargement and correction of our topographical knowledge of the islands, resulting from the Government survey, seem once more to have aroused the author to a sense of the importance of the subject, and in 1887 he commenced a series of papers on the history of the changes in the Mount Loa craters. He had not proceeded far with this work, however, before he felt the need of a second personal examination of the district. With characteristic energy, he undertook, in spite of his advancing years, a ten-weeks' journey, involving over ten thousand miles of travel, in which he visited all the chief points of interest; and the book before us is the outcome and monument of his labours.

The work of criticizing and reconciling the accounts given by numerous travellers, beginning with notices written as long ago as the year 1823, has been admirably performed by Prof. Dana. Without his personal knowledge of the localities, and the aid afforded by the new and accurate maps of the islands, the task would, indeed, have been a hopeless one; for many of the descriptions were penned by unscientific and careless writers, and inaccuracies and exaggerations are encountered at every step. By sifting and correlating this confusing mass of evidence, however, the author is able to give a clear and connected narrative of the changes in the Kilauea crater, and to illustrate the position of its floor after each of the great eruptions, which took place in 1823, 1832, 1840, 1868, and 1886. The result is that we are furnished for the