

sent use, especially when we remember that County Councils can, if they please, levy a rate in addition to the Imperial grant. We shall agree with Dr. Gull, of the Grocers Company's School, that the battle of scientific and technical training *versus* the humanities ought to be decided by evolution and natural selection, rather than by authority; though what this latter exactly means I do not quite understand. Authority can only act when evolution and natural selection—in other words, public opinion—has decided what is wanted. But we shall disagree with him when he says that “no time could be worse than the present for settling this question.” We say that no time can be better, or rather that no time can be so good as the present; for if we do not settle the question soon it will be too late, and our people will lag so far behind those of other countries, that we shall not be able to fetch up our lee way, and the victory will not be to us. To my mind much nonsense is talked, especially by those whom I may without offence call the high-faluting educationists, about so-called culture, and of the necessity for the study of grammar and the humanities for children of every degree. Mr. Bowden, President of the Union of Teachers, is not one of these. He calls attention to the fact—deplorable enough—that only about five per cent. of our five million of children on the registers of elementary schools are in the sixth standard. This being so, it is our duty to give these few children whose parents are willing and able to let them pass on to a higher level of education in secondary schools, that which will most effectively fit them for the life which they afterwards have to follow. Ours is essentially an industrial population, and as the Duke of Devonshire said, at another conference on the same subject, “any advance in the direction of utilising existing secondary schools must be made not for the benefit of the middle classes only, but also of the whole of the working-class community of this country”; and to this I may add Mr. McCarthy's axiom, that school machinery which makes for clerky employment at the expense of the skilled handicrafts, is so far harmful. Still, it is mainly our middle-class education which is in chaos and needs reform. The higher secondary education is probably sufficiently provided for by over 100 so-called “public” schools having a total of from 26,000 to 27,000 pupils. Primary education is under State direction, and will improve from year to year. To amend the middle-class education is more important even than to improve the educational ladder. Mr. Llewellyn Smith's most excellent report on the condition of secondary education in London shows how crying is the necessity in the metropolis for such middle-class schools. The few that exist in the kingdom are often insufficiently endowed, and their work is generally hampered by competition with private venture schools; and how bad the education is, which is given in many of these middle-class private schools, can, as Dr. Gull says, hardly be conceived. These inefficient schools must be either mended or ended before we can make much progress, and for this we need a Registration of Teachers Act, and an effective system of inspection. Honest private schools would benefit, and the others would disappear.

Of all the communications made concerning the relations present and prospective of the universities to the secondary education of the country, the letters read by Prof. Jebb, from the late Master of Balliol, are of the greatest interest, as giving the latest opinions of one who throughout his life was an educational, and especially a university, reformer. Dr. Jowett stated his desire that there should be a universal abiturient examination, giving the right of admission to the universities. Then he wished to give all students who pass such an examination the right of becoming candidates, without residence or restriction of age, for any university examination, with or without honours, or for any part of the examination. He further remarks that such persons

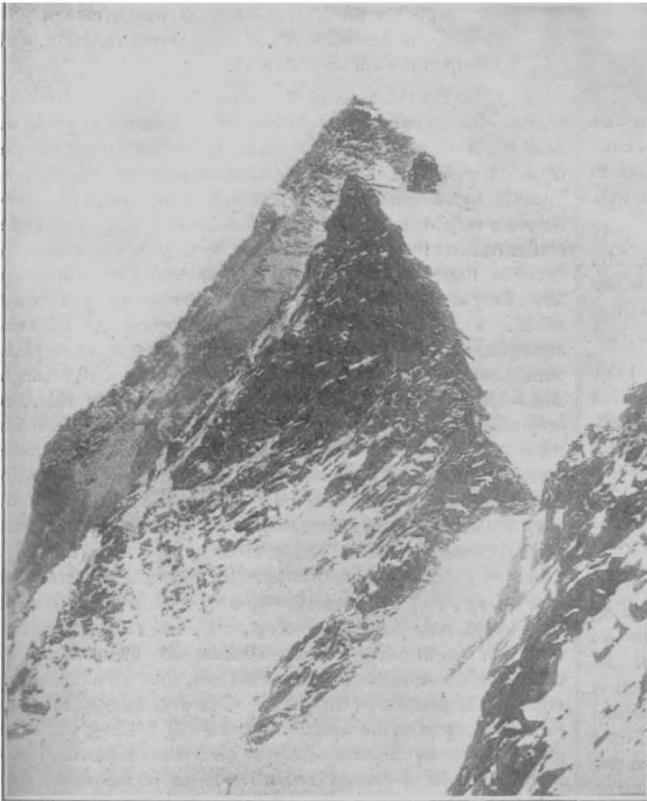
should have the privilege of admission to the libraries, of competing for university certificates and prizes without restriction of age. Moreover, he would give to such candidates as have shown any considerable merit, sums of money to enable them to carry on their inquiries; and this, says Prof. Jebb, was intended by Dr. Jowett to apply to all branches of knowledge without distinction, which the universities could best teach. These are indeed truly radical proposals, for they mean throwing open the university honours and emoluments to the world. That such measures should have been suggested in the almost dying words of the greatest master of the greatest of Oxford colleges, is in itself remarkable evidence of the present position of Oxford opinion. If fifty, or perhaps twenty, years ago, a radical undergraduate were to have made such suggestions, he would have stood a chance of being expelled from the university, like Shelley, for blasphemy; now they are the last words of Jowett, quoted in the presence of the Vice-Chancellor, with approval by Jebb.

H. E. ROSCOE.

THE SONNBLICK MOUNTAIN OBSERVATORY.

THE progress of meteorological science having rendered necessary a more careful investigation of the conditions of the higher strata of the atmosphere, the subject of mountain stations was considered at the Meteorological Congress at Rome, in 1879, and the various problems which could best be solved by such observations or in balloons were discussed. Among these may be mentioned:—The decrease of temperature with height, especially during cyclones and anticyclones; terrestrial and solar radiation; the behaviour of barometric maxima and minima at the earth's surface and at great heights, and the increase of wind velocity with height. Several important stations were already in existence, and the establishment of others was strongly recommended. Herr Ignaz Rojacher, the proprietor of the Rauris gold mines, having proposed to the Committee of the German and Austrian Alpine Club, in the year 1884, the erection of a meteorological station at the Miners' House on the Sonnblick, in the province of Salzburg, situated at an elevation of 7550 feet, about half-way between Kolm-Saigurn and the summit of the Sonnblick, Dr. Hann, director of the Austrian Meteorological Service, gladly took advantage of the suggestion, and in December of that year the station was equipped by the Austrian Meteorological Institute. But it was soon found that the site was unfavourable for the purpose, and Herr Rojacher decided that the only suitable position would be the summit of the mountain. After surmounting many difficulties, the work was satisfactorily carried out in the early part of 1886. The Alpine Club undertook the expense of the erection of a wooden house, while the Austrian Meteorological Society provided the self-recording instruments and undertook the building of a substantial tower for the anemometer and the establishment of telephonic communication between the summit and Rauris, a distance of 15½ miles, and, further, to supply instruments to the base station at Kolm-Saigurn. The accompanying illustration shows the position of the Observatory on the peak of the mountain; it is situated at a height of about 10,150 feet, and is the highest station in Europe. The difficulties of dragging the materials for the construction of the Observatory over glacier and snow for a distance of about 900 yards can hardly be overrated. Each trip occupied from three to four hours, and it was at this stage of the work that the greatest assistance was given by Herr Rojacher and his men. His intimate knowledge of the conditions of the glacier and *névé*, obtained from thirty-five years' residence in the neighbourhood, enabled him to select a favourable

site and to carry out successfully the construction of the building. Dr. J. M. Pernter has given a graphic description of the difficulties of an ascent which he made in February 1888 (*NATURE*, vol. xlii. p. 273), during which the foremost guides sank to their hips at every step, despite their use of snowshoes. The maintenance of the station in winter was a matter of great difficulty; but it was materially facilitated by the fact that the Miners' House workmen were at hand for the conveyance of fuel and for carrying out any necessary repairs. But in the year 1888 Rojacher was compelled, from failing health, to sell the mine, and in 1889 operations were discontinued; he succumbed in January, 1891, and then Kolm was abandoned altogether. Under these circumstances, the difficulty of continuing the Sonnblick Observatory was increased. The observer could not remain alone on the summit, separated from all human communication by



a difficult journey of several hours over the snow, and it became necessary to hire men specially to carry up the fuel. The Salzburg section of the Alpine Club gave up the use of the house on the Sonnblick, and their contribution was, to a great extent, withdrawn, so that the maintenance of the Observatory was jeopardised. It was under these conditions that the Sonnblick Society, whose first report for 1892 we received a short time ago, was formed for the purpose of aiding in the expense of continuing this most important station. The Society already numbers 280 members, and, in addition to several other contributions, receives considerable subventions from the Austrian Government and the Committee of the German and Austrian Alpine Club.

Since the establishment of the Observatory in 1886, several valuable discussions on the conditions of the atmosphere in the higher regions have emanated from the pen of Dr. Hann and others, and these have already

materially modified the prevalent ideas relative to the nature and origin of storms. In the present report Dr. Hann gives a general account of the climate deduced from observations taken up to the present time. From this it is seen that in each winter the temperature has fallen below minus 22°, and in March, 1890, it fell to minus 30°·3. The warmest month is August with a mean temperature of 33°·6, and the coldest month is February, mean temperature 5°·5. The precipitation is mostly in the form of snow; even in the six summer months, May to October, fully 85 per cent. of the fall consists of snow; out of about 200 wet days in the year, rain only fell on 21 days, and then it was often a kind of sleet. The greatest rainfall measured in one day was 2·8 inches on September 1, 1890. The amount of cloud is perhaps of most importance to tourists; this is most prevalent in June and least in December, just the opposite to what obtains in the lowlands. The month of June has only a quarter of the possible amount of sunshine, while in December it has about half the possible amount. Thunderstorms are less frequent on the Sonnblick than in the lower regions, and generally are not so severe. The Observatory is protected by a properly erected lightning conductor, and contains a room suitable for anyone who may wish to carry on researches at a great altitude. This room is entirely reserved for scientific purposes; another apartment, capable of accommodating twenty persons, has been provided for ordinary visitors. The Sonnblick Society deserves the thanks of all meteorologists for carrying on the work in their Observatory. The establishment of the mountain station has led to the elucidation of many obscure problems, and still more important results can confidently be expected.

NOTES.

Mlle. KLUMPKE, who has just gained the degree of Doctor in Mathematical Sciences at the Sorbonne, is the first lady who has obtained that distinction. The full title of her thesis was "Contribution à l'étude des anneaux de Saturne," and the following is a translation from *La Nature* of the complimentary terms in which M. Darboux addressed the gifted authoress in granting her the degree:—"You have occupied yourself with one of the most interesting questions in astronomy. The great names of Galileo, Huyghens, Cassini, and Laplace, without speaking of those of my illustrious colleagues and friends, are connected with the history of each of the great advances in the attractive but difficult theory of the rings of Saturn. Your work is not a slight

contribution to the subject, and it places you in an honourable position among the ladies who have devoted themselves to the study of mathematics. During last century Mlle. Marie Agnesi gave us a work on the differential and integral calculus. Since then Sophia Germain, as remarkable for her literary and philosophic talent as for her mathematical faculties, was held in esteem by the great geometers who honoured our country at the beginning of this century. And but a few years ago the Academy of Sciences, on the report of a commission in which I had the honour to take part, awarded one of its best prizes to M^{me}. Kowalewska, placing her name by the side of those of Euler and Lagrange in the history of discoveries relating to the theory of the movement of a solid body around a fixed point. In your turn you have entered upon your career. We know that for some years you have devoted yourself with great zeal and success to investigations connected