would not add to the number of subjects taken up at entrance, for boys were already overburdened in their preparation.

The Head Master of Clifton College, Mr. Glazebrook, said that this was a question on which the public schools had a strong claim to be heard, since an increasing number of boys passed direct from them to Woolwich—the proportion last July being about four-fifths of all the candidates. But the discouragement of science was not so serious to the great schools as to the smaller and less expensive schools, where as a rule science is well taught, but not German. He thought it undesirable that these latter should be debarred from competition. It was not only by the assignment of marks that science was now discouraged, but also by the system of instruction. Boys who went up to Woolwich tolerably proficient in chemistry were put back to the elements, and at the end of their first year knew less than when they entered. Such boys were naturally inclined to complain that science at Woolwich was a farce, and to urge their friends at school to take up another subject which was treated more seriously.

Further remarks were made by Sir B. Samuelson, who especially advocated the encouragement of all types of boys from the public schools, by Prof. Jelf, and by Mr. Shenstone. Statements were made by the Director-General of Military Education and the Inspector-General of Fortifications; the latter officer emphasised the importance of German and of electricity, and said many cadets were markedly deficient in the latter subjects when they left Woolwich. In concluding, Mr. Campbell-Bannerman expressed his obligation to the deputation, and his sense of the importance of the matter brought under his notice, which would have his most careful attention.

It will be seen from this report that the position of cadets of scientific ability at the Royal Military Academy is, as we pointed out some time ago, far from satisfactory, and that this view is now not only held by men of science but also by many head masters and by distinguished members of the military profession, who on this and on other occasions recently have spoken clearly on the subject.

The main defects of the present system seem to be:—(1) That science and German, two subjects which ought to go hand in hand in the early education of officers of the scientific branches, are at present brought into distinct conflict; (2) that in effect so great a bonus is given to German in the course of work at the Royal Military Academy as to be likely very soon to drive science out of the entrance examination, and to a corresponding extent out of the public schools; (3) that the standard of work of the cadets in science, and particularly in electricity when they leave the Royal Military Academy, is lower than it ought to be in very many cases.

Of these defects the last, which is doubtless largely the outcome of the first two, is probably the most important, and it will never be remedied so long as the authorities cling to the idea that a sufficient knowledge of several branches of science can be given to the cadets, even when they are quite new to such studies, in the moderate amount of time that can be spared for them during the comparatively brief course of work at the Royal Military Academy. That this idea is wrong we have pointed out again and again. If those who are responsible for the education of the cadets at Woolwich really desire that the cadets shall attain to a higher standard in science, they must not only encourage the admission of lads of scientific ability, but they must either set apart much more time to such work at the Academy, and give opportunities for, and more encouragement to, advanced work on the part of those who take up the subject, and do well in it at the entrance examination; or, if the giving of more time to science at the Royal Military Academy is impracticable, as is very possibly the case, they must so alter the conditions of the entrance examination as to secure that the cadets shall learn their elementary chemistry and heat at school, and be able to devote their science work at Woolwich wholly to electricity, which is technically of such great importance to

them, but to which at present they can only give a portion of their time.

By doing this the authorities of the Academy will not only advance the interests of the service, they will also avoid that discouragement of the more scientific cadets and of the teaching of science in schools which is admittedly a result of the present system as a whole.

In conclusion, we would urge strongly what was pointed out by Sir Henry Roscoe on Friday, that it is not merely scientific knowledge but scientific ability which is wanted, and that it is only by giving due weight to science at the entrance examination and afterwards that this can be secured.

CLIMBING PLANTS.¹

THIS forms the fourth part of A. F. W. Schimper's "Botanische Mittheilungen aus den Tropen," and is devoted to the description and illustration of the various adaptations for climbing exhibited by native Brazilian plants observed on the spot. Following Darwin, the author distinguishes four different classes of climbing plants, according to the manner in which they climb; but his four classes are not quite the same. Darwin divided them into those having stems which twine spirally round a support; those which climb by means of irritable organs; those which climb by means of hooks; and those which climb by means of roots. Darwin's investigations, it will be remembered, were chiefly directed to the elucidation of the phenomena exhibited by twiners, and such plants as climb by means of tendrils. Schenck treats in a general way of all four classes of climbers; and his work is more in the nature of a text-book than an account of experimental research. He divides climbing plants into Spreizklimmer, Wurzelkletterer, Windepflanzen, and Rankenpflanzen, corresponding nearly to the hook, root, twining, and tendril climbers of Darwin and others. But the Spreizklimmer include all climbing plants that neither twine nor possess either irritable climbing organs or clinging roots, whether armed or unarmed. Thus the least organised of climbing plants are those having weak, slender, rampant stems and branches which grow up among other plants and rest upon them without any other means of support; whilst the most perfectly developed climbing plants are those provided with highly sensitive nutating tendrils, such as the Cucurbitaceæ and the Passifloraceæ. It is difficult to find an exact English equivalent for "Spreizklimmer," but "incumbent climbers" might be employed to designate this class. Twiners revolve with the sun, as the hop (*Humulus Lupulus*), or against the sun, as the scarlet-runner bean (*Phaseolus vulgaris*); but Schenck agrees with Darwin and other observers that they are not sensible to contact. It is only the plants classed as tendril-climbers that exhibit this property; and this irritability is developed both in caulomes and in phyllomes—that is in branches and in leaves, more or less modified for the purpose. In England there are only three woody climbers, namely: the ivy, a root-climber; the honeysuckle, a twiner; and *Clematis vitalba*, a leaf-stalk climber; but in Brazil, and in other tropical countries, they are exceedingly numerous, and present a great variety of adaptations to this end. Dr. Schenck, however, does not confine himself to Brazilian forms. He briefly reviews all the types that have come under his observation. Plants climbing by means of tendrils (irritable organs), conceived in the widest sense, are classified according to the organs, or parts of the organs, by means of which they climb. First he takes the leaf-climbers, which climb by means of

¹ "Beiträge zur Biologie und Anatomie der Lianen im Besonderen der in Brasilien einheimischen Arten." Mit 7 Tafeln. Von Dr. H. Schenck. (Jena: Gustav Fischer, 1892.)

sensitive revolving leaflets (*Fumaria*), by the petioles (*Clematis* and *Tropæolum*), by the tips of the leaves (*Tillandsia* and *Flagellaria*). Then come the leaf-tendrils proper, such as *Pisum sativum* and *Cobaea scandens*. But the almost peculiarly tropical branch-climbers, plants climbing by means of modified caulomes (branches or inflorescences), present the most singular forms. Dr. Schenck divides them into branch-climbers proper, which have elongated naked or leafy revolving branches clasping the branches of other plants; hook-climbers, which develop hook or claw-like supports; "watch-spring" climbers and thread-climbers. The grape-vine and passion-flower are classed under the last. The climbing organs of the "watch-spring" type are very curious. They are naked, attenuated branches, which roll up in one plane, forming a loose elastic spiral, between the coils of which the support is caught. The spirals usually thicken only at the point of contact, thereby effecting a firm hold of the support. Dr. Schenck does not enter deeply into the anatomy of climbing organs, though he states that differentiation of the tissues of sensitive organs only takes place after contact. The plates are all devoted to the illustration of the external morphology of climbing organs. A systematic list of genera containing climbing species is given, and there is also a chapter on the geographical distribution of climbing plants.

W. BOTTING HEMSLEY.

CLAPHAM JUNCTION AND PADDINGTON RAILWAY.

THE statement that appeared in the press towards the end of last week, that the promoters of this railway had applied to the committee who rejected the bill for permission to bring the subject again before the House of Commons did not represent the fact. What really occurred may be gathered from the following extract from the *Times* of Saturday, the 25th inst. :—

"It had been the intention of the promoters of the Clapham and Paddington Railway Bill to ask the committee, presided over by Sir J. Kennaway, to grant permission to have the bill recommitted, in order to meet the objections as to electric traction raised by the Royal College of Science and the City and Guilds Institute. After a private consultation with the chairman, it has been decided that the public application to this effect should not be made until some arrangement has been come to with the authorities of these institutions in the Exhibition Road, and until steps had been taken to find out whether they would agree to the substitution of cable for electric traction on that portion of the line coming within the radius of the scientific colleges. . . ."

Even the preceding corrected statement rather represents the aspect which the promoters would like the matter to assume than the strict truth. For as a matter of fact it has been pointed out first that the passage of the electric locomotives and the train of iron-framed carriages running nearly due north and south within some 40 feet of magnetometers would stop all work, even if the motive power were a cable; secondly, that the vibration caused by the quick moving trains and by the slapping cable would be ruinous; and lastly, that no one but an over-sanguine company promoter would imagine that an electric railway with a fragment worked by cable in the middle would be a lasting arrangement. Let but the bill pass, and within six months after the railway was open an interesting collection of broken cables would be on exhibition in the Houses of Parliament. It is amazing that the question of the shifting of the route of the proposed railway a few hundred yards to the east or west of Exhibition Road seems to be altogether neglected.

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NOTES.

HONOUR has been done lately to two British men of science by the Academy of Sciences of the Institute of France. On March 6 Sir Joseph Lister was elected a Foreign Associate in succession to the late Sir Richard Owen, and on March 20 Sir Henry Roscoe was elected a Correspondent in the section of chemistry in succession to the late M. Abria.

THE Brazilian expedition, under charge of Mr. A. Taylor, for the observation of the solar eclipse has arrived safely at Ceara.

THE Liverpool Marine Biology Committee have recently appointed Mr. J. Henry Vanstone, from Prof. Howes' Laboratory at the Royal College of Science, South Kensington, as Resident Curator of their Biological Station at Port Erin in the Isle of Man. The important addition which has been made to the station during the winter, viz. a two-storied tank and aquarium house, is now finished, and will be open for use at Easter, when Prof. Brady, Mr. Thompson, Prof. Herdman, and several other biologists are going to Port Erin to work. Nine investigators and students have already applied for accommodation at the station during April, and others are coming at later periods during the summer, so there seems every prospect of the institution being well used this season.

In connection with the conversazione to be held at the Royal College of Surgeons of England on July 5, to celebrate the jubilee of the Fellowship of the College, it has been decided, as this year is also the centenary of the death of John Hunter, to organise an exhibition of pictures, MSS., books, furniture, &c., connected with the great surgeon. In addition to the articles which are the property of the College of Surgeons, the exhibition will include other relics, the loan of which has been kindly promised by the present possessors. The librarian of the College will be pleased to give further information to any owner of Hunterian relics who may be willing to lend them for exhibition.

A VERY successful conversazione was held by the students of the Royal College of Science in the South Kensington Museum on Thursday, March 23. Mr. C. V. Boys concluded the various entertainments by exhibiting Mr. Henry Dixon's photographs of spiders walking on water, Lord Rayleigh's and his own photographs of bursting bubbles, and by showing his interesting experiments with soap bubbles.

THE council of the City and Guilds Institute for the Advancement of Technical Education have nominated the following as members of the Technical Educational Board of the London County Council, viz. :—Mr. Herbert Saunders, Q.C., Sir Owen Roberts, and Dr. W. J. Russell, F.R.S.

THE Camera Club announces that the seventh annual Photographic Conference will be held in the theatre of the Society of Arts on Wednesday and Thursday, April 12 and 13, under the presidency of Captain W. de W. Abney, F.R.S. Papers will be read by some of the leading students of photography, and all photographers are invited to take part in the conference.

SOME time ago the Egyptian Government appointed a commission to examine the building in which the archaeological collection is housed at Ghizeh. This commission has now finished its investigations, and, according to the Cairo correspondent of the *Times*, its report shows the condition of the building to be even more dangerous than it was known to be. A fire would completely destroy the building in the course of a few hours. The Egyptian Government propose to have the Museum made fireproof at a probable cost of £90,000, but the result is not expected to be satisfactory. A new building on a