

the research was carried out with the object of finding how best to anneal blocks of optical glass, the apparatus is available for testing any glass, chemical or otherwise, and Messrs. Hilger, having the apparatus set up in their laboratory, are prepared to test specimens of glass for the trade, and thus provide the valuable information which they are able so easily to obtain.

C. V. BOYS.

#### UNIVERSITY AND HIGHER TECHNICAL INSTRUCTION IN FRANCE.

ONE of the principal articles in the *Revue générale des Sciences* for June 30 is that by Prof. Paul Janet, of the Sorbonne, director of the Higher School of Electricity, concerning the rôle of the universities in higher technical instruction, especially in relation to the Bill before the French Senate, at the instance of M. le Goy, to sanction the establishment of faculties of applied science in the universities. The proposed measure is exciting considerable interest, not only amongst the learned bodies in France, but also amongst those engaged in scientific industries. The question has assumed a deeper interest in view of the problems raised by the war and of the position and means of development at its close of the national industries, especially those closely dependent upon chemical and electrical science.

Incidentally the question raised by M. le Goy in his project embraces other deep considerations relating to economic problems, including the right direction and utilisation of capital, the question of tariffs and raw materials, a closer union of capital and labour, and especially the creation of a better educated industrial *personnel* in the scientific control and administration of industry, together with measures for the amelioration of industrial conditions. It is urged with considerable force that there is need of a much closer understanding between men devoted to pure science and those engaged in the higher technical industries. The former are often ignorant of the difficulties which beset the engineer and manufacturer, despite the systematic methods he employs in the actual production of commodities; whilst the latter, resenting the accusation that they lack all scientific spirit, do not hesitate to apply derisively the epithet "Sorbonnique" to the science which is incontinently thrust upon them.

Only when this antagonism is entirely removed by a closer sympathy, understanding, and appreciation, on the one hand, of the potentialities of pure science, and on the other of the difficulties which beset its translation into terms of production, can there come that union of effort upon which the successful development of industry depends. In the case of the electrical industry it is freely admitted by all concerned that it finds its solid base in electrical science; nor is it now possible to pretend that any man can hope to become a competent engineer whose technical skill is not founded upon a sound training in science.

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The article goes on to consider the existing resources for the training of the expert engineer, and passes in rapid review the faculties of science existing in the universities of France and their competence to train the future technologist; the technical institutes, such as the Chemical Institute at Nancy, founded in 1890, and the Electro-Technical Institute at Grenoble, founded in 1892; the Ecole Polytechnique and the Central School of Arts and Manufactures at Paris, and other special schools in France. An unfavourable view is taken, however, as to the competence of the faculties of science, which have never shown any appreciation of the needs of industry, adequately to train the men, who in fact do not really seek them, destined for industrial pursuits. A firm distinction is drawn between the ideals and aims of the university and the functions of the schools of practical science. The former need for their realisation absolute freedom and long leisure, since their purpose is the exploration and discovery of natural laws, the attainment of exact knowledge as the grand end of their existence, and the moral rather than the material progress of humanity. Research is with them the end, and teaching only the means. The latter, to achieve their purpose, require direct contact with industrial problems, and the due and serious employment of the time of their students, with strict discipline and method and supervised work.

In order to bring the universities into closer touch with industry, it is suggested that they should, with the collaboration of practical men, establish scientific institutes preparatory to industry. It is further proposed to found a very few higher technical schools for more advanced industrial training and research, established and controlled directly by men eminent in industry, yet aided by the State and directly linked with the Ministry of Public Instruction.

#### PUBLIC SCHOOLS AND OTHERS.

"PUNCH" of September 27, under the title of "Public Schools," prints a poem of which the last two verses are as follows:—

*Spite of the anti-classicists' arraignment,  
Spite of the ink so petulantly spilt,  
Not by exact laboratory training,  
Not by the test-tube character is built.*

*Only in fields of emulous endeavour,  
Fired by the teaching of the famous dead,  
Public-school boys, who play the game for ever,  
Grow into leaders and inspire the led.*

#### PUBLIC SCHOOLS: AN ANSWER.

Dear *Punch*, your poet praises public schools,  
Not well, nor wisely, nor by half enough.  
Their modern Army Classes, "mostly fools,"  
Have shed his "grand old fortifying" stuff.  
Their "labs," which he accentuates so oddly,  
Seem just as formative, and just as godly.

Again, those test-tubes, which his words abhor,  
 And cheap thermometers with paper zeroes,  
 All made in Germany before the war,  
 Were not unknown to many of their heroes.  
 [Just now sweet girls in improvised pavilions  
 Are turning English test-tubes out by millions.]

Boys from our "public schools" (including those  
 Provided, non-provided, and the rest of it),  
 When once the opportunity arose,  
 Quitted themselves like men, and made the best  
 of it.  
 The highest praise for such a band of brothers,  
 Would be: "Each did his duty like the others."

Then, as to leadership, I knew a lad,  
 By nature quite unqualified to grapple  
 With Greek and Latin verses. This was bad.  
 Worse still, a Jew, he never went to chapel.  
 And yet he learnt, in spite of missing sermons,  
 His duty to his men, and to the Germans.

Perhaps the Duke was right in his remark,  
 That old, apocryphal, and hackneyed saying;  
 And Eton Playing-fields, and Regent's Park,  
 And all fair fields where British boys are  
 playing,  
 Have proved of higher value to the nation  
 Than classical, or modern, education.

W. D. E.

### NOTES.

THERE have been much overlapping and unevenness of distribution in connection with the food parcels sent to British prisoners of war; and little scientific guidance has been sought or given as to the food-values of the things included in the parcels. The first of these defects will be remedied by a scheme which is to be brought into effect on December 1. It is announced that the Central Prisoners of War Committee, recently established by the British Red Cross Society and the Order of St. John, has, with the authority of the Government, now made the necessary arrangements for co-ordinating and controlling the work of the various associations and individuals at present sending parcels to British prisoners of war in Germany and other enemy and neutral countries. These arrangements have been made with the view of securing:—  
 (1) That every prisoner shall receive an adequate supply of the comforts in the form of food, etc.; (2) that the excellent work being done at present by associations and individuals shall be disturbed as little as possible; (3) that overlapping and consequent waste shall be reduced to a minimum. In order to attain these objects the following arrangements have been made:—  
 (1) All parcels must be sent through the Central Committee or an association authorised by it; (2) individual senders are requested not to send food parcels, but to arrange for this to be done by a recognised association. It is hoped that individuals and organisations now collecting funds for prisoners of war will continue their efforts, and will send the money collected either to the Central Committee or to such recognised association as they prefer. Subscriptions and donations should be sent to the Right Hon. Sir Starr Jameson, Bt., C.B., 4 Thurloe Place, London, S.W. All other communications should be addressed to the Secretary, Central Prisoners of War Committee, 4 Thurloe Place,

London, S.W. We suggest to the committee that guidance is needed as to the most suitable things to send from the point of view of food-values. A prisoner of war doing moderate work requires a daily ration which has an energy value of 2500 calories, and may be made up of proteins, 100 grams; carbohydrates, 400 grams; and fats, 50 grams. It is possible to combine all these constituents in a single foodstuff, or to see that the ratios are roughly supplied by the combination of several things in a parcel. The British Science Guild has appointed a committee to make suggestions relating to food parcels, and the Central Prisoners of War Committee should enlist its aid or that of other food experts in order to advise associations as to the most suitable constituents of the parcels.

THE Board of Agriculture announces that an estate of 2363 acres near Patrington, in the East Riding of Yorkshire, about fifteen miles distant from Hull, has been acquired under the provisions of the Small Holding Colonies Act, 1916, for the purpose of a land-settlement colony of ex-service men. The soil is a rich alluvium capable of producing very heavy crops. This colony, when fully developed, will consist of a central farm of about 200 acres and sixty small holdings of "mixed farming" type, averaging about 35 acres in extent. The equipment of each of the latter will include a comfortable cottage and the necessary farm buildings for carrying on the holding. The central farm will be under the management of a director, and will be equipped with machinery, implements, horses, etc., which will be let out on hire to settlers requiring them. Selected applicants will, if necessary, receive preliminary training by working on the central farm under the supervision of the director, and be paid wages until such time as they are considered capable of working a holding independently. They will then be allotted, at a reasonable rental, land near their cottages which, if of less extent than the average-sized holding above indicated, may be afterwards increased by taking land from the central farm. Co-operative methods will be adopted for the purchase of requirements and the consignment and disposal of produce. This is, we believe, the first experiment of its kind in this country, and its development will be watched with great interest. For some years there has been a great controversy as to the merits of schemes of this kind, and now arises the opportunity for the large-scale test. The experience gained is likely to be of great value, deciding whether or not such colonies can be run on an economic basis.

PROF. A. S. DONNER, director of the observatory at Helsingfors, has presented to the University, of which he was formerly rector, the sum of 8000l., to ensure the continuance, and indeed the completion, of the "Catalogue photographique du Ciel, Zone de Helsingfors," begun under his direction in 1890. Hitherto the work has been paid for, partly by the University, partly by Prof. Donner out of his private means. The sum now allotted by him is intended to cover all expenses for twelve years, when, at its present rate of progress, the task should be finished.

THE Sociedad Argentina de Ciencias Naturales, Buenos Aires, has elected as corresponding members Sir Ernest Shackleton and Mr. W. H. Hudson, author of "Argentine Ornithology" and other works. Mr. Hudson is an Argentine by birth.

THE opening meeting of the Institution of Electrical Engineers for the session 1916-17 will be held on Thursday, November 9, when the eighth Kelvin lecture will be delivered by Dr. Alexander Russell, who