point of view, however, the difference between them is fundamental, and issues into the three experimental tests referred to. The deflection of light in a gravitational field follows naturally, if gravitation is attributed to the heterogeneity of space-time. Any entity—whether light or matter—pursuing its natural path, will appear to change the character of its motion when the space-time through which it travels departs from the simple Euclidean type. It does not matter what the moving thing is; all that counts is the region through which it moves. The dilemma of the older theory does not exist from the relativistic point of view: light must be deflected or the theory must be abandoned.

Fortunately, the amount of the deflection which relativity demands is measurably different from that which the electromagnetic theory allows. According to the relativity theory, a ray of light which just clears the sun's limb should suffer a deviation of about 1″·75; according to the other view, the deviation should be either half of this or nothing at all. It is this difference that makes possible the test which is about to be applied. On September 21 the sun will be leaving the constellation Virgo—very close to the celestial equator. The position is not so favourable with respect to neighbouring bright stars as was that of May 29, 1919, when the original test was made. On the other hand, the experience and criticisms arising from the previous attempt are available for the guidance of the present observers, and, granted favourable conditions, there seems to be no reason why the result should not become decisive.

The British Association at Hull.

YORKSHIRE hospitality is proverbial, and it has been very pleasantly manifested during the meeting of the British Association just concluded at Hull. The citizens have in many ways shown themselves to be proud to entertain the Association, and the facilities they have offered to the members have been exceptionally helpful. Each member was provided with a badge, and this was not only a free pass on the quick and convenient tramway system of the city, but also secured personal guidance and interest from citizens in the streets or in vehicles of any kind. It would be impossible for a city to show greater interest in its visitors or to do more to make their sojourn pleasant, and the many attentions have been much appreciated, particularly by officers and other active members of sections who usually have not the time to search for all the amenities which a place of meeting may afford. A number of free luncheons have been provided, and when the days' meetings have been over tea has been served in the writing-room at the Guildhall, and has been found both grateful and comforting to the members. For these and other unusual attentions the Association is no doubt chiefly indebted to the local secretary, Mr. T. Sheppard, curator of the Hull Museums, but with him is associated the town clerk, Mr. H. A. Learoyd, and the generous hospitality would not have been possible without the active interest and support afforded by the Corporation and people of the city. The Handbook to Hull and the East Riding of Yorkshire, edited by Mr. Sheppard and presented to each member, is a volume of permanent value, and as it will be on sale for the low price of five shillings we propose to publish a separate notice of it in an early issue.

At the meeting of the general committee at which the report of the council was presented, a resolution was passed conveying to Prof. Turner the most cordial thanks of the Association for the valuable services he has rendered to science in general and the Association in particular during his nine years' work as one of the general secretaries. In its report the council stated that it had received with great regret Prof. Turner's intimation that he would not be able to attend a meeting in Canada in 1924. Prof. Turner himself pointed out that it was desirable, on various grounds, that his successor should have experience of the working of an annual meeting at home before taking part in one overseas, and he therefore placed his office at the disposal of the general committee as from the Hull meeting. The council and the Association owe a deep debt of gratitude to Prof. Turner for his unremitting care for the interests of the Association as general secretary since 1913, and therefore during a time of exceptional difficulty, including as it has the Australian meeting, the war, the revival of the annual meetings since the war, and the period when, on the death of the late general treasurer and assistant treasurer in 1920, he acted for some months as treasurer in addition to his other work.

Mr. F. E. Smith, director of scientific research at the Admiralty, and secretary of the Physical Society, accepted the invitation of the council to be nominated as Prof. Turner's successor, and the general committee unanimously voted his appointment to the office of general secretary of the Association. The three new members of the council appointed by the general committee are Mr. E. N. Fallaize, Dr. C. S. Myers, and Prof. A. Smithells.

Next year's meeting will be at Liverpool with Sir Ernest Rutherford as president, and in the following year the place of meeting will be Toronto. The invitation to Canada was conveyed by Prof. J. C. Fields and Prof. J. C. McLennan, and it was announced that a grant of about 11,000*l.* would be available towards meeting the travelling and other expenses of visiting members.

SUMMARIES OF ADDRESSES OF PRESIDENTS OF SECTIONS.

EQUAL PAY TO MEN AND WOMEN FOR EQUAL WORK.

IN Prof. F. Y. Edgeworth's address to Section F (Economics) the question whether the wages of men and women should be determined on the same principles—in particular, through universal unrestricted competition—was discussed on purely economic grounds. Notwithstanding the general presumption in favour of *laisser faire*, it is maintained that some regulation is required for desperate competition tending to the

degradation of labour. Such kinds of competition being ruled out, there is advocated an equal labour-market, the same blend of competition and combination, for both sexes alike. The unequal pressure of male unions, crowding women into comparatively few occupations, is deprecated, and it is pointed out that a sufficient safeguard against such pressure is not afforded by the interest of the employer seeking to maximise his profits. This insufficiency is explained by a principle widely applicable in economics which may be stated thus. When a quantity is in the neighbourhood of a maximum value, a small change in the conditions on which it depends—the independent variables—is generally attended with a *very* small change in the dependent quantity. Some suggestions were offered with respect to the difficulty that the value of work is not always measurable without regard to the sex of the worker; *e.g.* the employment of a woman is less profitable, so far as, other things being equal, a man is generally more useful in an emergency. Lastly, Prof. Edgeworth considered the serious impediment to equality in the labour market caused by the burden of supporting a family which is commonly undertaken by men. The proposal to obviate this difficulty by the endowment of motherhood was examined; objection is taken to the (commonly implied) socialistic transference of enormous sums from one class to another. The objection is not equally directed against subsidies in kind for the purpose of education; nor against the proposal that within the same social grade, or association, the childless should contribute to the support of children.

DR. RIVERS AND THE DEVELOPMENT OF PSYCHOLOGY.

IN Section J (Psychology) the presidential address by Dr. C. S. Myers was "On the Influence of the late W. H. R. Rivers (President-elect of the Section) on the Development of Psychology in Great Britain." Rivers was invited in 1893 (in his thirtieth year) by Michael Foster to Cambridge, where he systematised the first course of practical work in experimental psychology in this country. His earliest experiments there were on colour vision and visual space perception, and he contributed to Schafer's "Textbook of Physiology" an exhaustive article on vision, which is still regarded as the most accurate and careful account of the subject in the English language. He soon extended his observations on colour vision and space perception to the Torres Straits Islanders, the Egyptians and the Todas, his membership of Dr. Haddon's Cambridge Anthropological Expedition to the Torres Straits giving him his first introduction to ethnology. These several investigations will ever stand as models of psychological method. In 1903, on his return from the Todas, he began his memorable share in the striking observations on the recovering cutaneous sensibility of Dr. Head's arm. The distinction therein reached between epicritic and protopathic sensibility laid the foundations of Rivers's later views on instinct, intelligence, dreams, and the unconscious. While working with Head, he was also engaged in studying the effects of alcohol, caffeine, and other drugs on muscular and mental work. These elaborate investigations he published as the Croonian Lectures to the Royal College of Physicians in 1908. By them he advanced the pharmacological study of the effects of drugs on man, showing how important it is to disguise the drug and to provide a control mixture indistinguishable in taste from the disguised drug mixture, so as to avoid the complicating effects of suggestion, interest, and sensory stimulation. From 1907 to 1915 he confined himself to ethnological work, but during the Great War his treatment of the psychoneuroses in the Army and in the Air Force led him back to psychology. A period ensued in which Rivers's psychological genius was released from its former shackles and his intuition was no longer controlled by intellectual doubt. It is difficult to exaggerate the fruitful, stimulating character of his criticisms of Freud and of his views on the unconscious, on instincts, and on dreams which poured forth with such astonishing profusion during the last years of his life. His main object was to give a biological interpretation to the data of psychology. His wide interests, sympathies, attainments, and knowledge, his generosity and honesty, and his devotion to scientific methods inspire us in our common aim—the Advancement of Science.

ORGANISATION OF THE AGRICULTURAL INDUSTRY.

LORD BLEDISLOE, in his address on "The Proper Position of the Landowner in Relation to the Agricultural Industry," delivered before Section M, pointed out that organisation in the interests of the agricultural producer is the chief desideratum of British rural industry, and for this, enlightened leadership is essential. The leader and chief organiser should be the landowner, if he would but take his proper position after due training. Under present conditions it is evident that the unification of the rôles of the landowner and farm tenant is a condition precedent to the full, confident, and enterprising development of the agricultural industry on economic lines. Nevertheless, it must be recognised that the system of occupying ownership cannot exist in this country to the entire exclusion of that of landlord and tenant. English law and custom in relation to the settlement of estates and to the letting of farms are now frequently obstructive in nature under the changed conditions, and it might be well if modifications could be brought about—*e.g.*, if it were made possible in certain cases to sell part of a settled estate in order to provide the necessary capital for the cultivation or industrial equipment of the remainder of it.

In all continental countries the political power enjoyed by agriculture is founded on the fact that it is an organised industry, whereas in Great Britain it is not. As a result, the continental landowner derives as a rule a net income of 3*l.*-4*l.* per acre, as compared with 1*l.* per acre in the United Kingdom. Much of this may also be attributed to the failure of the British farmer, in the absence of the landowner's stimulus, to utilise the results of education and research, whereas abroad, especially in Germany, more scientific methods are readily adopted, notably in the economic employment of feeding stuffs and fertilisers.

Many suggestions may be made as to methods whereby British agriculture, under the direction not

of the State but of the landowners, may be stabilised on a remunerative basis, among which may be mentioned the organisation of credit facilities, co-operative purchase and sale, utilisation of machinery and power, improvement of livestock sires, establishment of central dairies and bacon factories, the fuller exploitation of all farm products, especially in times of glut, and above all the elimination of superfluous and unnecessary middlemen. Apart from the heavy burden of local and Imperial taxation the toll levied by the middlemen is the main cause of the poverty-stricken condition of the English agricultural labourer; the disparity of the prices paid to the farmer and by the consumer for the same produce was well illustrated by tables.

During the last eight years occupying owners have increased by 49 per cent. and the acreage that they own by 100 per cent.; the political and industrial power resulting from this considerable reinforcement of their class should prove the greatest stimulus to enterprise on the part of landowners. The existence of the Central Landowners' Association is a welcome augury of future corporate efficiency, as its objects are to a great extent economic and constructive. In conclusion Lord Bledisloe emphasised once more the need for the effective organisation of agriculture and for the solidarity of all three classes of the agricultural community, without which continuous progress is difficult of attainment.

Current Topics and Events.

THE Rowett Institute of Research in Animal Nutrition, Aberdeen, was formally opened by H.M. the Queen on Tuesday, September 12. It will be remembered that the Institute, which in the two years of its existence has done valuable work on problems of animal feeding, is under the control of the University of Aberdeen and the North of Scotland Agricultural College; the director is Dr. J. B. Orr. The Institute owes much to the generosity of Dr. J. Quiller Rowett, after whom it was named, who contributed a sum of 10,000*l.* towards its endowment (NATURE, September 9, 1920, p. 67). This was followed by another gift for the purpose of purchasing a farm which would allow of expansion of the Institute; H.M. Treasury, on the recommendation of the Development Commission, promised a further sum of 20,000*l.* It is the establishment of such institutions as the National Institute of Agricultural Botany and the Rowett Institute of Research in Animal Nutrition which will go far towards improving the unsatisfactory state of our knowledge of food problems, both animal and human.

To the August number of the *Nineteenth Century* Sir Arthur Keith contributes a timely article on the present position of Darwinism as applied to the problem of man's origin. The strange action of a strong party among the legislators of Kentucky in America, and ill-informed articles in certain American newspapers, have met with some feeble response in this country; and an authoritative statement of the case which can be understood by the general reader is especially needed at the present time. Sir Arthur Keith has stated the case admirably, and he emphasises the fact that if a new edition of Darwin's "Descent of Man" were prepared to-day, the work would merely need large additions, and scarcely any important revision. The discoveries of the fossil remains of man made since 1871 agree in pointing towards a common ancestry with the apes. The progress in our knowledge of human embryology within the same period has revealed a succession of facts which can be explained only on the theory of descent from lower forms of life. The latest discovery, that the development and growth of all parts of the body are regulated and co-ordinated by a "hormone" mechanism (the pouring of substances into the circulating blood by the ductless glands), leads even to the hope that before long we may begin to learn something about the processes of evolution. To the investigator, indeed, Darwinism is not a mere theory, but an instrument of advance, trusted as implicitly as are the Admiralty charts by a navigator.

WE learn from the *Times* that an expedition headed by Capt. F. Hurley has left Sydney for Port Moresby with the object of exploring New Guinea from the air. The party will include an ethnologist and a naturalist. Two seaplanes are being taken and will be used in a four months' air survey of the western portions of British New Guinea. Meanwhile the scientific section of the expedition will navigate the Fly River in a ketch. The cost of the seaplanes is being borne by Mr. L. Hodson, of Sydney. Owing to the densely forested nature and steep slopes of the interior, exploration of New Guinea on foot is most arduous. Capt. Hurley's scheme promises some hope of success, but landing places, except along the coast, will be difficult to find. The leader's previous experience in exploration was obtained with the Australian Antarctic Expedition. He has also flown across the Australian continent.

THE earthquake reported on the morning of August 27 in the Midland Counties was possibly, as Sir George Fordham has suggested in the *Times*, caused by the bursting of a meteorite. A tremor and sound were observed at 9.12 A.M. (G.M.T.) over an area of about 650 square miles with its centre a few miles south of Birmingham; at Woodhouse Eaves, seven miles north-north-west of Leicester, at 9.13; and at Whissenthorpe, near Oakham, at 9.10. The observed times are so close that it seems probable that all three shocks were due to the same cause, and the detachment of the three areas and their nearly linear arrangement are certainly suggestive of successive explosions of a meteorite.

THE centenary of the Yorkshire Philosophical Society, which was founded in 1822, will be celebrated on Wednesday, September 20. The members of the Society and its guests will be received in the