

it had been largely stoneware imported from Germany. Fused silica ware has to some extent been able to make good the deficiency, and has helped to equip numerous factories erected in connection with the supply of explosives, especially as regards apparatus for the concentration of sulphuric acid and the condensation of nitric acid. Dr. F. Bottomley gives details of plants fitted with fused silica condensers, evaporators, etc., for these two acids, in the Journal of the Society of Chemical Industry for June 15, and also outlines the progress which has been made in the production of fused silica apparatus generally. Sixteen years ago small articles of silica were made by laboriously fusing quartz a few grains at a time in the oxyhydrogen blowpipe flame; at the present day the weight of fused material which can be worked exceeds 200 lb. The temperature required is between 1800° and 2000° C. In the plastic condition the silica is very ductile, and can be drawn out like glass in lengths of 90 to 100 ft.

TECHNOLOGIC PAPERS Nos. 83 and 84 of the U.S. Bureau of Standards represent continuations of Merica and Woodward's work on the "Failure of Brass" (No. 82). In the former an account is given of the study of the effect of tensile stress on the electrolytic solution potential of brass to various solutions, the results indicating an increase of E.M.F. of about 0.1 millivolt per 10,000 lb./sq. in. of stress. An explanation is given, based upon this effect, of the decreased ductility and strength exhibited by brass, where corroded while under tensile stress, and describes the growth of fissures in brass under such conditions. In the latter the results are recorded of an investigation of the initial stresses produced by the burning-in, without pre-heating, of constrained parts of castings of manganese bronze. Results have shown that, in general, tensile stresses will be produced within the burned-in area equal in value to the true elastic limit of the material. The conclusion is drawn that burning-in of such material should not be practised without thorough pre-heating or subsequent annealing of the whole casting.

THE *Biochemical Journal* for May contains a paper by Mr. H. E. Annett describing the isolation of raffinose from the seed of the jute plant (*Corchorus capsularis*). The sugar was identified by its content of water of crystallisation, specific rotatory power, and the change of the latter when the sugar was acted upon with emulsin, invertase, and melibiase. Further, the sugar does not give an osazone, but from the products of its hydrolysis with invertase, glucosazone and galactosazone were isolated. The sugar was isolated by extracting the finely ground jute seed, which had previously been exhausted with ether and petrol, with alcohol, and precipitating the alcoholic extract with ether. The particular sample of seed examined contained 2.25 per cent. of raffinose.

Of the chemical changes induced in amino-acids by bacterial action, the most common and the one that has been most studied is simple decarboxylation. It is by this process that putrescine and cadaverine are formed in the putrefaction of ornithine and lysine respectively. The deamination (*i.e.* loss of ammonia) of amino-acids by bacteria is usually accompanied by reduction, *e.g.* in the production of *p*-hydroxyphenyl-propionic acid from tyrosine. Mr. H. Raistrick, however, in the *Biochemical Journal* for May, describes the formation of an unsaturated carboxylic acid by the action of bacteria on histidine. This author avoided any possible secondary reactions by arranging that the histidine was the only organic substance present in the medium on which the bacteria were cultivated. When *B. coli com-*

munis, *B. typhosus*, *B. paratyphosus* A, *B. paratyphosus* B, *B. enteritidis*, Gaertner, or *B. dysenteriae*, Flexner, is grown on a medium consisting of Ringer's solution + histidine (β -iminazolyl- α -amino-propionic acid), from 5 to 60 per cent. of urocanic acid (β -iminazolylacrylic acid) is formed, the largest proportion with *B. paratyphosus* A, and the smallest with *B. typhosus*. The acid was identified by analysis, melting point, and preparation of the picrate and nitrate. This is the first instance on record of the bacteriological conversion of an amino-acid into an unsaturated acid.

MR. JOHN MURRAY'S list of announcements for the coming autumn contains several works which should be of interest to readers of NATURE, *e.g.* "The Life and Letters of Sir J. D. Hooker, O.M., G.C.S.I.," by Leonard Huxley, two vols.; "The Life of Sir Clements Markham, K.C.B., F.R.S.," by Admiral Sir A. H. Markham; "The Life of Sir Colin C. Scott Moncrieff," edited by Miss M. A. Hollings; "Rustic Sounds and other Studies in Literature and Natural History," by Sir Francis Darwin; "Volcanic Studies in Many Lands," by the late Dr. Tempest Anderson; second series, "Cotton and other Vegetable Fibres," by Dr. E. Goulding (Imperial Institute Handbooks), and a new and revised edition of "The Book of the Rothamsted Experiments," edited by Dr. E. J. Russell.

MESSRS. J. WHELDON AND CO., 38 Great Queen Street, Kingsway, have just issued a catalogue (New Series, No. 80) of books and papers on chemistry, pure and applied, mineralogy, mining, and geology. The list contains many works published in enemy countries and therefore difficult to obtain new at the present time; also the modern library of Mr. Andrea Angel, who lost his life in the East End explosion in January last. The catalogue will be sent free upon application.

OUR ASTRONOMICAL COLUMN.

METEORS ON JULY 19.—Though meteors were singularly rare in the two hours before midnight on July 19 they were rather abundant and brilliant after midnight. At 12h. 12m. G.M.T. one of magnitude 1 shot rapidly from 339°+72° to 261°+41°, and left a bright streak. Its radiant was probably between α and β Persei. At 12h. 18m. a meteor exceeding magnitude 1 passed from 320°+35° to 317°+27°, and was directed from Cepheus. At 12h. 37m. a very fine meteor with an extraordinarily long course of 89° travelled slowly from 328°+11° to 238°+10°, and left a bright streak in its wake. At 13h. 35m. a blue, flashing meteor shot rapidly down across the star η Pegasi, and was directed from a shower near α Cygni or at 316°+48°. At 13h. 50m. a tolerably bright meteor, leaving a streak, crossed the cluster in Perseus from a radiant at 40°+20°, and at 14h. 15m. a bright Perseid, leaving a streak, shot from 326½°+17½° to 316°+6°. Duplicate observations of any of these interesting objects, if sent to Mr. W. F. Denning (44 Egerton Road, Bristol) would enable their heights, etc., to be computed.

ANNUARIO OF THE RIO DE JANEIRO OBSERVATORY.—The thirty-third issue of this useful publication has recently been received. It contains numerous ephemerides and other astronomical data, together with an excellent collection of tables for the reduction of astronomical observations. A section is devoted to terrestrial physics, with special reference to the magnetic elements and the intensity of gravity, and another includes details of meteorological observations made at twenty-five stations in Brazil. Tide-tables for seven Brazilian ports, calculated with the aid of the Kelvin tide-predictor, are also included in the volume.

SOLAR PROMINENCES.—An important memoir on solar prominences has been published by Mr. and Mrs. Evershed (*Memoirs Kodaikanal Obs.*, vol. i., part ii.). The total number of prominences observed and photographed at the sun's limb at Kenley and Kodaikanal during the years 1890 to 1914 was about 71,000, and in recent years the denser prominences have also been photographed as absorption markings on the sun's disc. This wealth of observational material is discussed from many points of view. It results, among other conclusions, that there are four belts, two in each hemisphere, which are specially prolific in prominences. The low-latitude belts are coincident with the sun-spot zones, and in these the prominences vary in number with the spots, although direct association of spots and prominences is comparatively rare. In the high-latitude belts the prominences are most frequent between spot minimum and spot maximum; they reach the pole about spot maximum, and die out there, to form again in latitude $\pm 50^\circ$. Magnetic storms appear to be more closely related to spots than to prominences, but it is possible that an overlying prominence is a necessary condition for a spot to produce a magnetic storm. Large high prominences are roughly divisible into four classes, namely, broad massive prominences, tapering forms, diffused forms, and prominences in rows. Prominences associated with spots take the form of jets, rockets, or arches. The prevailing rocket type suggests the action of an intermittent explosive force in spots, which only partially neutralises gravity, while in the large masses gravity appears to be completely neutralised by the upward force. The density of prominences is probably very low, and it is suggested that the luminosity may be due to the internal energy of the atoms, possibly derived mainly by absorption of the intense solar radiation. Numerous photographs of prominences are reproduced.

FUEL RESEARCH.

AT the request of the Board of Trade and other Government departments, the Fuel Research Board has undertaken an investigation on the most suitable composition and quality of gas, and the minimum pressure at which it should be supplied, having regard to the desirability for economy in the use of coal, the adequate recovery of by-products, and the purposes for which coal is now used. The Research Board will also act in an advisory capacity. With the great extension of the use of gas for power and heating, and the possibility of using efficiently for illuminating purposes, by means of the incandescent mantle, gas of much lower illuminating value than formerly, more importance now attaches to calorific value than to candle-power. Practice has necessarily conformed to the altered conditions, for gas engineers have gone a good way in solving the problems involved in making the best use of coal in their industry, in the recovery of by-products, on which success so much depends, together with supplying a gas satisfactory for the wide and varied requirements. The industry has indeed been exceptional in the valuable research work done, its enterprise being shown in the establishment of the Livesey Laboratory at Leeds.

Possibly the Research Board will find little scope for improvement in the general production of coal-gas, although no one would claim that finality has been reached, but some important problems remain for investigation, notably the production of low-temperature coke and the utilisation of the oils and very rich gas produced. The gas engineer has hitherto not regarded this question in an unprejudiced manner, whilst the advocates have generally been over-optimistic, so that independent investigation is really wanted.

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There is also a wide field for investigating how coke-oven gas may be more extensively employed to supplement the output of suitably situated gasworks, and the more extended use of water-gas.

The Fuel Research Board, with the sanction of the Committee of the Privy Council for Scientific and Industrial Research, has appointed a committee of inquiry into the utilisation of Irish peat deposits. The terms of reference to the committee are as follows:—
“To inquire into and to consider the experience already gained in Ireland in respect of the winning, preparation, and use of peat for fuel and for other purposes, and to suggest what means shall be taken to ascertain the conditions under which, in the most favourably situated localities, it can be profitably won, prepared, and used, having regard to the economic conditions of Ireland; and to report to the Fuel Research Board.”

Though the inquiries of the committee will ultimately lead up to the consideration of peat as a source of energy in central power stations, there are sound reasons why this aspect of the problem should be postponed to a later stage. On one hand, the Fuel Research Board is already organising an extensive inquiry into the problems of fuel economy in connection with power production, and the results of this inquiry will supply the fundamental data and information which will be required when the time comes for the consideration of any wide scheme of development in Ireland. On the other hand, any schemes of development must be based on a more exact knowledge than is at present available regarding the selection of the more favourably situated bogs and the possibilities of winning and transporting partially dried peat to centres at which it may be converted into marketable products. It is obvious, therefore, that the inquiries of the committee are likely to be most fruitful if they are concentrated on the fundamental problems, for until these are settled no satisfactory progress can be made.

The following appointments have been made to the committee:—Sir John Purser Griffith (chairman), Prof. Hugh Ryan, Prof. Sydney Young, Mr. George Fletcher, and Prof. Pierce Purcell (secretary). All communications should be addressed to the Secretary, The Peat Inquiry Committee, University College, Dublin.

GLASS TECHNOLOGY.

THE newly formed Society of Glass Technology is to be warmly congratulated on the first number of its *Journal*, which has just appeared. The volume contains five original papers and a considerable number of abstracts dealing with glass and allied subjects. These abstracts, in which an endeavour is made to summarise the literature of the subject—including that appearing on the Continent so far back as the beginning of 1915—form a most valuable feature, particularly as the difficult work of abstracting has been well done. If, at a later stage, the society could undertake to carry the abstracts back—if possible for a period of ten years—they would earn the gratitude of all concerned with glass. There is, of course, always the difficulty in such abstracts of discriminating between the wheat and the chaff, so as to avoid burdening the pages with abstracts of valueless material; such discrimination, however, demands a degree of intimate familiarity with the subject in both its industrial and scientific aspects which is scarcely obtainable in the case of glass, since this has only recently begun to receive in this country the attention which it deserves. It is, further, a little doubtful whether the editor of this *Journal* has been wise in including abstracts on purely optical subjects, since these are more