

adhesive, so that the superiority of glue must be due, directly or indirectly, to the presence of other substances of which, so far, little is known. Investigations on this point are proceeding; in the meantime the committee have evolved a novel and highly promising test, that for "diffusible nitrogen." A gel of standard composition is immersed in a known volume of water, and after a fixed time the nitrogen content of the latter is determined by Kjeldahl's method. This is, of course, due to compounds of much lower molecular weight or aggregation than gelatin, and—apart from some exceptions—the amount of diffusible nitrogen is roughly inversely proportional to the tensile strength. While this result is of great interest, it can scarcely be said to simplify the problem stated above, namely, what factors cause the difference between pure gelatin and glue. Speaking, however, quite generally, we know of no connexion between constitution and adhesive properties; the striking fact is how sparingly the latter are distributed between a very few materials even among highly hydrated colloids.

Lack of space forbids detailed reference to the very interesting investigations on the extraction of gelatin from various raw materials, but the committee's successful attempt to find a strong vegetable adhesive

must be mentioned. A protein was prepared from castor bean residues—which are poisonous and therefore useless as cattle food—and this protein forms a strong adhesive with calcium hydroxide and alkaline salts in various proportions. From the data given regarding the solubility of this protein, it appears to be related to casein, and the mechanical properties of the adhesive prepared from it are not much inferior to those of casein glues.

The report is supplemented by an appendix—which greatly exceeds in length the report itself—giving a "Descriptive Bibliography of Gelatin." This is a very complete, lucid, and impartial summary of the vast literature, in which no paper of any interest seems to have been overlooked. Those from English sources—though important—are remarkably few in number, and this state of things suggests questions which are none the less curious for being familiar. One is whether the development of a very promising discipline is going to be left to workers of other nations as completely as was (to take an unhackneyed instance) that of the theory of functions; the other, whether such cases of neglect arise from deep-seated national tastes or idiosyncrasies in research, or merely from inadequate opportunities for tuition and experimental work.

The Decomposition of Tungsten.

THE September issue of the *Journal of the American Chemical Society* contains an account of the preliminary experiments made by Drs. Wendt and Irion on the decomposition of tungsten at extreme temperatures, with the production of helium, a report of which appeared in the daily press, to which reference has already been made in *NATURE* (April 1, 1922, vol. 109, p. 418). The authors regret the exaggerated early report, given wide publicity by the press after its oral presentation, and emphasise the preliminary character of the work. They describe fully the apparatus used for attaining temperatures above 20,000° by passing heavy currents through metal wires, and state that when tungsten wires are exploded in a vacuum at such temperatures the spectrum of helium appears in the gases produced. When the explosion is conducted in carbon dioxide, 0.713 milligram of tungsten gave rise to 1.01 c.c. of gas not absorbed by potash solution. The authors remark that their method "includes factors, both of cause and of error, analogous to those operative in the voluminous and inconclusive controversy on the evolution of helium in various types of low pressure electrical discharge tubes, extending from 1905 to 1915."

The electrical apparatus provided for currents of 40 amperes at 100,000 volts during the brief period necessary to charge the condenser, which was then discharged through a tungsten wire 0.036 mm. diameter and 4 cm. long. The wires were stretched between heavy copper terminals in a special spherical glass bulb of 300 c.c. capacity, which was capable of

withstanding momentarily an enormous outward pressure, and had a small discharge tube sealed on for examination of the spectrum of any gas produced. The wire was heated to well above 2000° for 15 hours in a high vacuum before the explosion was made, and the tube before explosion showed no spectrum or fluorescence when connected with a 50,000-volt coil. No dust, smoke, or solid residue was left after the explosion. Gas was present, which showed the faint presence of the strongest green line of mercury, probably from back diffusion of the pumps, and the only other line uniformly present and positively identified was the strong yellow line of helium. It would seem that both hydrogen and neon were absent. The absence of hydrogen is of interest, since the atomic weight of tungsten is exactly 46 times that of helium, and this element would therefore not be expected to give hydrogen on disruption of its atom.

The explosion in carbon dioxide seems to have been less conclusive, as the authors do not seem to have been quite sure of the absence of unabsorbable impurities. They point out that if the entire weight of 0.713 milligram of tungsten had been converted into helium, 4 c.c. of this gas should have been obtained. The much smaller volume found would point to the production of heavier gases. Altogether the work is of very great interest, although the authors emphasise the necessity of complete analysis of the gas obtained before anything conclusive can be stated. This chemical test is to be made in the continuation of the work.

The Belt of Political Change in Europe.

IN a paper contributed to Section E (Geography) of the British Association at Hull, Prof. J. F. Unstead commented on the striking fact that the new states of Europe, or those which have gained or regained independent existence during recent years, lie in a relatively narrow belt of country extending across the whole of Europe from the Arctic Sea in the north to the Mediterranean in the south. West of this belt changes have been slight, while east of it a final settlement has not been reached. Of this

belt no part has been exempt from change. It contains about 100 millions of people or about one-fifth of the inhabitants of Europe, and covers about one-fifth of the total area of the continent. The new states have been formed mainly by the break-up of three great empires, the disintegration of which was one of the results of the world war.

Prof. Unstead pointed out that the belt of change is a region caught between east and west, marginal to each and influenced by each, and he showed how

this idea applies both to physical and human conditions. Western Europe, with inland seas and intricate structure and relief, provides varied resources, maritime, agricultural, and mineral. Into this region spread the civilisation of the Mediterranean region, and here communities found the physical conditions which enabled them to develop. Physical barriers and relatively small productive areas gave distinctiveness and led eventually to the growth of separate nationalities. These nations became self-governing and, broadly speaking, democratic.

Eastern Europe, on the other hand, is characterised by uniformity of structure and relief, with great belts of similar climatic conditions and natural vegetation extending through it into Asia and so facilitating human migrations and military movements, mainly east and west. From the human as well as the physical point of view this region was for many centuries an extension of Asia and had but a scanty population. The Slav languages became characteristic and the authority of the Czar dominated the greater part of the region. The Asiatic incursions which in earlier centuries swept across the eastern plains were as a rule checked when they reached the belt of change. Here they found varied conditions of life, but different from those to which they had been accustomed. Traditions and names of invading tribes have been preserved, differences of language remain, and not infrequently feelings of hostility and memories of conquest are rife. Sufficient time has not yet elapsed for a complete fusion of races in the several regions of the belt. The Asiatic elements still assert themselves: Finns, Ests, Magyars, Bulgars, and Turks stand out, contrasted in one way or another with Swedes, Germans, Slavs, Albanians, and Greeks of European descent. Moreover, two small Nordic groups, Letts and Lithuanians, have preserved their identity from early times and remain distinct from other Nordic people in language and nationality. On the other hand, the occurrence of minerals has led to the partial penetration of Western influences.

Prof. Unstead went on to show the diversity of religion and political conditions in this belt of change. The problem of minorities exists in one form or another throughout the belt, and is perhaps the greatest menace to future peace. The present political units are by no means self-sufficing, and their frontiers are frequently barriers to trade and hindrances to production. Furthermore, the attainment of political freedom has often been accompanied by a check to production, commerce, and prosperity.

University and Educational Intelligence.

ABERDEEN.—Applications are invited for the Blackwell Prize, value 30 guineas, for an essay on "The Sculptured and Inscribed Stones of the North-East and North of Scotland." The essays, bearing a motto and accompanied by a sealed envelope bearing the same motto and giving the name and address of the writer, must reach the secretary of the university on or before January 1 next.

CAMBRIDGE.—Mr. J. Walton, St. John's College, has been appointed junior demonstrator of botany. Mr. F. A. Potts, Trinity Hall, has been reappointed demonstrator of comparative anatomy. Dr. A. B. Appleton, Downing College, Mr. D. G. Reid, Trinity College, Mr. A. Hopkinson, Emmanuel College, and Mr. V. C. Pennell, Pembroke College, have been reappointed demonstrators in anatomy. Dr. F. Roberts, Clare College, Mr. T. R. Parsons, Sidney Sussex College, have been reappointed demonstrators in physiology. Mr. G. V. Carey, Clare College, has

been appointed educational secretary to the Cambridge University Press.

A. J. Smith, Downing College, has been appointed University Frank Smart Student in Botany. The John Winbolt prize has been awarded to F. E. Smith, Sidney Sussex College.

LEEDS.—Mr. Lascelles Abercrombie, lecturer in poetry at Liverpool University, has been elected by the council of the University professor of English language and literature, in succession to Prof. Gordon, who was recently appointed to the Merton professorship of English literature at Oxford.

LONDON.—It was announced in NATURE of July 29, p. 166, that Mr. H. G. Wells had consented to offer himself as Parliamentary candidate for the University, at the invitation of the executive of the University Labour Party, upon the retirement of Sir Philip Magnus at the end of the present session of Parliament. At a general meeting of the party held on Friday, October 6, Mr. Wells was adopted as Parliamentary candidate as recommended by the executive.

It is announced that Mr. H. M. McCreath, head of the Agricultural Department, Seale-Hayne College, Devon, has been elected principal of the East Anglian Institute of Agriculture, Chelmsford.

A site consisting of nearly 20 acres has been presented by Mr. T. R. Ferens at a cost of about 10,000*l.* to the education authorities of Hull for the immediate purpose of providing accommodation for advanced technical departments. It is anticipated that a university college will be developed later on the site.

THE distribution of geographical teaching in the universities of Europe is illustrated in a map which accompanies a paper by Mr. W. L. G. Joerg, in the *Geographical Review* for July, on "Recent Geographical Work in Europe." From this map it appears that more than 120 universities in Europe (excluding Russia and allied Soviet states) have provision for geography. Germany, Switzerland, and France are perhaps the best provided, but Great Britain does not fall far behind. In Balkan lands, geography is fairly well represented in Bulgaria and Yugo Slavia; Rumania has four universities offering geography, while Hungary and Czecho-Slovakia also have centres of instruction. On the whole, the new or reconstructed states of Europe show every indication of realising the importance of the subject. The only states in Europe which would appear to offer no university geography are Latvia, Lithuania, Albania, Greece, and Ireland.

DURHAM University has recently published a calendar for the year 1922-23 (price 3*s.* 6*d.* net), a useful compilation which serves as a guide to affairs in the University. The first half of the volume deals with the University as a whole; its officers, the regulations affecting conduct and degrees, as well as the subjects required for the latter and for various diplomas are given. A special section is devoted to the fellowships, scholarships, and prizes which are awarded by the University. The remainder of the calendar is divided into three sections referring to the Durham colleges, the College of Medicine, Newcastle-upon-Tyne, and Armstrong College, respectively. It should be noted that up to and including September 1923 the matriculation examination will continue to be held in Durham and Newcastle; after October 1923 the matriculation examination (Newcastle Division) will cease to be held. The new regulations for matriculation in the Newcastle colleges, which will then come into force, are given in detail. In a concluding section of the volume there is an alphabetical list of members of Durham University.