

produce a gamete with 21 chromosomes. The union of two such gametes, if the chromosomes were balanced in qualities as well as in numbers, might have produced the first of the hexaploid wheats. Thus is crossing combined with chromosome aberrations made the basis for a theory of the origin of our cultivated wheats.

Contributions continue to be made to the study of size inheritance. The prevalent interpretation is that size in organisms and in their parts is controlled by cumulative polymeric size factors the various increments of which give the appearance of a continuous series. Much evidence is appearing in favour of this view. Sax³ has recently, from experiments with beans, found evidence of linkage between certain seed-coat colour patterns and certain factors for size of seed. Cases have even been found in which a factor for large size was contributed by the small parent. Such a result might occur if the small parent contained a few factors for large in addition to a number which made for small size.

Closely related to size-inheritance are the problems of shape. The work with animals indicates that some size factors may affect the body as a whole while others independently determine the size of particular organs. These conceptions have already been applied by Davenport to man, and in a recent contribution⁴ he considers the inheritance of body build. He recognises five classes of build, ranging from very slender to very fleshy. Two slender individuals usually have only slender children, while the progeny of fleshy individuals are much more variable. Such data lead again to the hypothesis of multiple factors, and it is believed that in some families so many as three genetic factors for increasing fleshiness are present. These factors are thought of as influencing size by the effect they have upon the activity of the thyroid, pituitary, and other endocrine glands.

Similar conceptions are being applied by Frets, Hildén, and others to the inheritance of head-shape. Thus it appears that several factors for broader head may change a dolichocephalic to a brachycephalic skull. Thus genetics is destined to have a fundamental effect upon the interpretations of anthropologists.

R. RUGGLES GATES.

The Carbonisation of Coal.

THE Chemical Engineering Group of the Society of Chemical Industry met on July 16 at the forty-fourth annual meeting of the Society at Leeds. Three important papers on features of coal carbonisation were read before a crowded audience, and the discussion had to be adjourned to another session proposed to be held in Leeds in the autumn. Solid fuels were dealt with in two papers: "Smokeless Fuels—the Present and Future Possibilities," by C. H. Lander and Margaret Fishenden, and "Solid Smokeless Fuels," by E. C. Evans. In the former paper the British fuel situation was analysed, particularly with the view of estimating the possibility of establishing new carbonising industries. If all coal were to be pre-carbonised, the disposal of gas and tar would become considerable problems. If domestic fuel only were to be carbonised, this difficulty would be much less, but it was considered that a coke of much more suitable character than that currently produced in gas works would be required. The domestic fuel market is the most promising outlet for carbonised

fuel of suitable character. It was concluded that the most suitable carbonisation process to meet this need cannot be defined with certainty. The solution of the problem may prove to be not in any single method of carbonisation but in several, each operating in circumstances most favourable to its requirements.

E. C. Evans gave a classification of smokeless fuels, directing attention to the properties of anthracite, for which there is a steady demand even to-day, in spite of its high price. This points a moral to those desirous of introducing carbonised domestic fuel. Gas coke he considered as far short of the ideal, particularly because of its high ash and moisture content. The reactivity of coke was treated at length, and the factors influencing it were analysed. Methods of low temperature carbonisation were discussed. In summing up, Evans thinks that low and high temperature systems are approaching one another, and that ultimately a compromise will establish itself. In the discussion it was significant that, in so representative an assembly of fuel technologists, no one could be found to assert confidently the commercial feasibility of existing methods of low temperature carbonisation which figures so prominently in the Press and on the platform.

F. S. Sinnatt and J. G. King brought forward a study of the tars and oils from coal. From an analysis of the economics of mineral oils and coal tars, they drew the conclusion that the prices obtainable for low temperature tars would, so far as present promise goes, be low and liable to great fluctuation. The calorific value of such tar is low, and the difficult miscibility with mineral fuel oil is a limitation. This is not necessarily fatal, for the Lessing process for separating the pitch-giving constituents, now under trial at the Fuel Research Station, shows considerable promise. Some account of these results was given. The limited knowledge of the chemistry of low temperature tar was emphasised, and it was suggested that organic chemists should take up the study of its properties. The production of liquid fuel from coal, either by hydrogenation of the coal or of the gasified product, was also discussed.

University and Educational Intelligence.

"INFORMATION regarding courses and careers open to students of science" proposing to enter the Faculty of Science of the University College, Cardiff, is given in a little pamphlet issued this year for the first time by the College authorities. It follows the lines of the similar pamphlet issued by the University of Birmingham last year and represents a commendable anxiety on the part of the College to acquaint parents, guardians, and heads of schools with the opportunities it offers, so that the last year or two at school of those intending to go on to college may be utilised to the best advantage.

FROM the Royal Technical College, Glasgow, and the Merchant Venturers' Technical College, Bristol, we have received prospectuses for 1925-26. The former, which is the only institution in Great Britain providing regular courses in the technology of sugar manufacture, announces that to meet the requirements of the beet sugar industry, the lectures in this subject will begin in January and will extend over the summer session. Both Colleges give lists of the engineering firms which offer facilities to students for acquiring practical experience in their works. The Merchant Venturers' College offer, as alternative courses for the degree of B.Sc. in engineering, a

³ Sax, K., 1924, "The Nature of Size Inheritance," Proc. Nat. Acad. Sci., 10: 224-227.

⁴ Davenport, C. B., 1925, "Body-build: its Development and Inheritance," Eugenics Record Office, Bull. No. 24, pp. 42, figs. 25.