Power Conference, which will take place in 1933 in Scandinavia, is proceeding steadily. The first plenary World Power Conference was held in London in 1924, the next in Berlin in 1930. There have also been sectional meetings with special programs, for example, at Basel in 1926 and London in 1928. The Scandinavian Conference will be such a special meeting, dealing with the energy problems of large industry and transport. Participation and collaboration of fifteen countries outside Scandinavia is assured and more than one hundred and seventy reports are announced. Some forty reports to be published at the meeting deal with problems of energy supply in large-scale industry, such as combined power and heat supply, the rôle of large-scale industry in national power schemes, etc. Many of the technical papers deal with the problems of long distance gas transmission, while other papers are devoted to more special power problems concerning the iron and steel industry, pulp and paper, and cement, sugar, textile and other steam heat consuming industries. Energy questions of transport provide the subjects for sixty-two reports; railway and marine transport, the peculiarities of city and suburban traffic are to be discussed with due emphasis on the new aspects which have been introduced by electric traction and Diesel engines.

DISCUSSION

ETHER STRUCTURE

IN SCIENCE for February 21, 1930, I proposed an explanation of the action of electric force and induction across a vacuum, that is, across the ether. The suggestion was to extend to the ether the conception used by Debye, that the dielectric properties of gases and electrolytes depend upon polarized ions or "dipoles" of the medium. The ether is thus to be conceived as having a structure, that is, with "ether dipoles" or polarized cells. From this we get directly the idea that an electric field produces linear arrangements of the ether dipoles, and this may have an effect on polarized light similar to crystal action. I have made an experiment to detect such possible effect. The electric field was between two aluminum strips 60 centimeters long and 1 centimeter wide and 0.5 centimeter apart. This condenser was in a high vacuum. The vacuum was so high that no discharge took place when the condenser plates were charged by a Holtz machine to approximately 30,000 volts. The electric field was horizontal. A beam of polarized light, with polarization plane at 45° to the horizontal was passed across the electric field. Not the slightest effect on the light could be detected when the field was put on and off. The analyzer was of the strained glass bar type ("Rayleigh Compensator") used by the late Lord Rayleigh in his experiment to detect a possible double refraction due to ether drift.[1] The sensitiveness was at least six seconds of rotation per centimeter beam length in the field. The field was about 60,000 volts per centimeter. Thus this experiment to detect an ether structure, like experiments for ether drift, gave a negative result. On a corpuscular light theory, the above experiment can also be interpreted as showing no electric moment of the light corpuscle or photon in the above conditions.

ALBERT P. CARMAN

UNIVERSITY OF ILLINOIS

[1] *Phil. Mag.*, p. 680, 1902.

ENERGY OF UREA SYNTHESIS

IN the study of the energy change in the synthesis of urea from ammonia and carbon dioxide by liver slices we have found that synthesis of urea is accompanied by a definite and measurable increase in oxygen consumption. Our present facilities do not permit of precise measurements, but the results so far obtained suggest that one additional molecule of oxygen is used for every molecule of urea synthesized. Similar values were obtained with both glucose and d-l lactate as fuel, and with and without ornithine. Comparison of the rates of synthesis of urea suggest that the fuel in this reaction is lactate or some product derived from it. It seems unlikely that more than a fraction of the specific dynamic action of protein can be accounted for by the superfluous energy released in the synthesis of urea from ammonia. Further experiments are in progress.

H. BORSOOK
G. KEIGHLEY

W. G. KERCKHOFF LABORATORIES OF THE BIOLOGICAL SCIENCES,
CALIFORNIA INSTITUTE OF TECHNOLOGY

HETEROSIS: SPECIFIC NOT GENERAL IN NATURE

IN studies of hybrid vigor or heterosis in F_1 oat plants, variable results were obtained from different crosses. In the F_1 of some crosses nearly all the measurable parts are greater in the F_1 hybrid than in the larger parent. In other crosses possibly only one or two characters are noticeably increased. The difficulty of obtaining oat crosses in large numbers is a serious obstacle to studies of heterosis in oats, but it is believed that an increase of 10 per cent. over the larger parent may safely be considered a significant increase where small numbers are involved. Examples of these results are found in the cross Richland × Fulghum and Richland × Markton. In the first cross the F_1 plants averaged 13.2 per cent. taller, bore