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.

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[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.

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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

17.5 per cent. more culms per plant, weighed 48.5 per cent. more, and yielded 35.2 per cent. more grain and 51.3 per cent. more straw on the average than the larger parent. In all other characters the hybrids were intermediate between the parents. In the second cross the F_1 plants yielded 18.9 per cent. more grain, and the grain-straw ratio was increased 33.8 per cent. over that of the larger parent. In all other characters the F_1 plants of this cross were intermediate in size between the parents. In other crosses other characters manifested the influence of heterosis.

Heterosis is commonly accepted as having a genetic basis and as such this increase in plant size is satisfactorily explained as being due to the bringing together in the F_1 of the growth factors present in both parents. The impression seems quite generally held that when heterosis occurs in an F_1 hybrid individual the increased size is of a more or less general nature, extending to all or most all the measurable parts of the hybrid organism. In the light of available knowledge it appears that this widely held conception may need some revision. Barring actual linkage, heterosis is a condition which more often has a rather high degree of specificity. In some crosses a number of the parts of the F_1 hybrid plant may show influence of heterosis, yet it does not necessarily follow that the parts are closely linked genetically. The fact that in some F_1 crosses only a single plant part shows the influence of heterosis, while in others there may be several showing increased size, definitely indicates lack of genetic linkage.

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THE PRODUCTION OF NUTRITIONAL ANEMIA IN WHITE RATS

I HAVE read with interest the artitcle entitled, "A Reliable Method for the Production of Nutritional Anemia in White Rats," by Robert S. Harris, which appears in SCIENCE for November 25. We have been feeding Klim to produce anemia in this laboratory for some time. At first[1] we reconstituted it by adding water, but for nearly two years now we have been feeding the dry powder, and have suggested it to a number of other laboratories.

Klim, being dried by a spray process, has less opportunity for metallic contamination than drum process milk powders. By purchasing in quantities of 500 pounds or more we have been able to standardize on the product of one plant, which runs quite uniform at 3 to 5 parts per million of iron and 1 to 2 parts per million of copper. This amount of copper corresponds very closely with that shown to be present in uncontaminated whole milk from different areas by Elvehjem and Steenbock and Hart.[2]

That Harris is able to produce a more pronounced anemia in a shorter time than we have reported[3] is probably due to a difference in method of handling prior to placing on the Klim diet. Elvehjem and Kemmerer[4] have shown that if young rats from the twelfth day, when their eyes open, do not have access to any supplemental food other than cow's milk, anemia develops very rapidly, whereas if allowed to partake of the usual solid breeding diet between the 12th and 21st (or 28th) day of age, development of anemia on a subsequent milk diet is much slower.

Harris' observation that there is an inverse relationship between rate of growth and hemoglobin is in agreement with the findings of other laboratories.

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MOSQUITOES KILL LIVE STOCK

REPORTS of the death of live stock and even of man as a result of mosquito attack are current, but apparently few of these have been verified. It seems desirable, therefore, to record a recent outbreak of *Psorophora columbiae* Dyar and Knab, in Florida, which resulted in the death of at least 173 head of live stock and poultry.

This outbreak came suddenly and with great fury on the night of September 5 and continued for several days. The losses were most severe the first night, many animals being found dead or nearly so the following morning. Mr. T. E. McNeel, of the Bureau of Entomology, who investigated the outbreak several days after it occurred, made a careful check on reported losses in the vicinity of Miami and verified reports of the death loss of 80 cattle, 67 hogs, 3 horses, 1 mule, 20 chickens and 2 dogs. Reports of losses at other points in the vicinity of the Everglades have been recorded, but have not been checked. Mr. C. D. Mathews, chief of the Bureau of Dairy Inspection of Miami, stated that the milk supply from the Hialeah district was reduced by about 1,000 gallons a day from September 6 to 10 and had not returned to normal on September 20.

The death of the animals was attributed by many to blood loss. The manager of the Miami Soap Company, who received most of the dead stock, stated to Mr. McNeel that when the heads of the animals were cut off there was no flow of blood as normally occurs.

[1] Levine, Remington and Culp, *Jour. of Nutrition*, 4: 469, 1931.

[2] *J. Biol. Chem.*, 83: 27, 1929.

[3] Levine, Culp and Anderson, *Jour. of Nutrition*, 5: 295, 1932; and Coulson, Levine and Remington, *Amer. Jour. Public Health*, 22: 1141, 1932.

[4] *Jour. Biol. Chem.*, 93: 189, 1931.