

advantage of fractionating leafy crops lies in the fact that the products are more valuable when separated than when combined. The proteins are suitable for non-ruminants and perhaps man, the fluid extract could be used for feed or as a medium for micro-organisms, and the fibrous residue, still containing some proteins and starches, is suitable for ruminants or even for fuel.

In many parts of the world there are abundant leafy wastes, such as potato haulms, sugar-beet leaves and sweet potato leaves. When, however, satisfactory techniques have been developed, our choice of domesticated plants might well be reconsidered. Plants that use sunlight most efficiently might be chosen rather than those grown merely because a use has been found for them. On the question of economics, leaf protein, even extracted from crops grown specially for the purpose, would cost less than existing protein foods and about the same as estimates for yeast and *Chlorella*.

The discussion revealed two trends of thought on these new natural sources of foodstuffs. One was that orthodox agriculture would see us through this century and that these novel methods should await the development of new techniques. The other was that present drawbacks to these new foods are largely due to lack of information and that further investigation is most desirable. As Mr. Pirie said, all methods of increasing the world's food supply must be pushed ahead, for they are complementary rather than conflicting.

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BRITISH GELATINE AND GLUE RESEARCH ASSOCIATION ANNUAL REPORTS FOR 1951 AND 1952

THE recently received third annual report of the council of the British Gelatine and Glue Research Association (pp. 13; 1951) covers the year October 1950–September 1951, and the fourth (pp. 19; 1952) for that ending in September 1952. The former report records an increase of two in the full membership but no change in the staff. Two meetings of the Research Panel were well attended, the second, a symposium on the uses of gelatine and glue, providing a valuable opportunity for interchange of views between manufacturers and users. It was decided that at future meetings, in addition to papers of the type previously presented, accounts would be given of the research work of the Association; and the visit to the laboratories, which is a regular feature of Panel meetings, has proved a valuable link between the Association's staff and that of member firms. The fourth annual report records two additions to associate membership and one to full membership, as well as the appointment of an additional research officer for work on the physical and mechanical properties of gelatine and glue. The laboratories were officially opened on November 29, 1951, by Sir Robert Dun-calf, and two further meetings of the Research Panel are reported (see *Nature*, 169, 24 (1952); 170, 24 (1952); and 171, 250 (1953)).

The reports of the Director of Research, included with each of these annual reports, indicate that during the next two or three years a substantial body of new knowledge concerning gelatine and glue will have been built up. Work on the purification of gelatin by ion exchange resins, for example, has shown that the ash content of gelatin is reduced from 2–3 per cent to 0.005 per cent by passing a 5 per cent solution through a mixed bed of the 'Amberlite' resins IR120 and IRA400. Even very high arsenic contents can thus be reduced below the limit prescribed for edible gelatine, and the method provides a ready means of determining isoelectric points. Detailed studies of the viscosity of very dilute solutions of gelatin have shown that the gelatin molecule is in a partly folded configuration at its isoelectric point, the equal and opposite charges along the molecule contributing to the folding. The technique developed by F. Sanger, in which fluorodinitrobenzene reacts with free amino groups of proteins, has been applied to the determination of end-groups in gelatin, and studies have also been made of the organic constituents of bone, while new methods have been developed for estimating the colour and clarity of gelatine and glue solutions and gels and for the accurate determination of arsenic in gelatine. A device has been constructed to facilitate accurate testing of jelly 'strength', and a detailed investigation of sampling errors in bacterial counts on powdered gelatine indicates that the variation is related to irregular distribution of bacteria in the gelatine, probably originating from the drying operation.

WORLD-WIDE CHANGES IN THE PHASE OF THE COSMIC-RAY SOLAR DAILY VARIATION

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MEASUREMENTS of the cosmic-ray diurnal variation at sea-level using directional counter arrays¹ have shown that the variation is at least in part due to an anisotropic distribution of the primary radiation entering the atmosphere. Since the variation is dependent on solar rather than sidereal time,

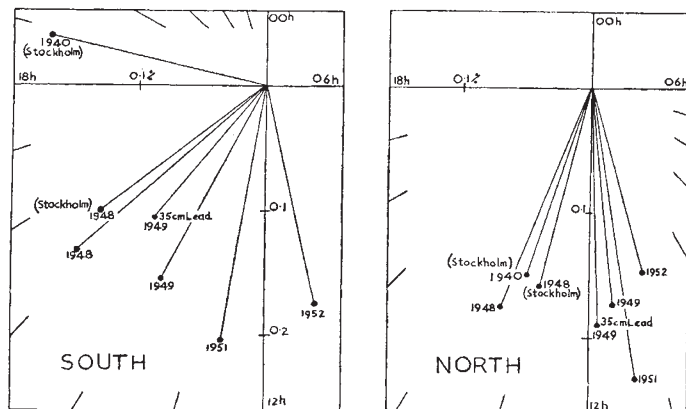


Fig. 1. Harmonic dials showing the first harmonics of the daily variation measured in Manchester and Stockholm using counter telescopes pointing south and north. All the measurements have been made using unshielded telescopes with the exception of one set of data for Manchester in 1949, when 35 cm. lead absorber was used