papers should go through the moulding stage before they are sent for publication. The head of a department should see that all papers leaving it are in good shape and worthy to bear its name.

Prof. E. J. King (British Postgraduate Medical School) said that manuscripts written by scientists are often very poor, and heads of department cannot be expected to replace the experienced editor in the highly skilled task of revising for publication. Editing is a burdensome job, and most scientists are grateful to the editors who give their time to it. Editors should do as much rewriting as they think necessary. But an editor needs to be a diplomat: he must know how to effect a useful compromise without causing resentment.

Mr. A. L. Bacharach (*J. Nutrition*) said that the basic question is: How much should an editor do? Some scientists are glad to have their manuscripts revised, but others go so far as to assert that papers should appear just as they are written, even complete with grammatical errors. The purpose of publication is to spread new information, and a paper will do this only if the reader has confidence in the author. Grammatical errors, verbosity and repetition undermine the confidence of the reader and should be corrected. It is helpful if manuscripts go through a process of 'internal editing' within a department (not necessarily by the head) before they are sent for publication. In one department that had adopted this procedure for more than fifteen years, only one in some two hundred of the papers sent for publication had been rejected or returned for rewriting. An editor is entitled to make every alteration he thinks necessary to improve the clarity and intelligibility of a paper, so that it can be read with intellectual comfort. Those who resist such alterations are generally the bad scientists—the good ones are glad to have their papers improved.

Dr. R. K. Callow (National Institute for Medical Research) said that a part of the problem is that some scientists are completely blind to typographical, grammatical and logical errors and unable to understand the concern that others feel about them. In his experience, a journal in which an editorial board of scientists did most of the editing, and a staff editor did only sub-editing, achieved the happiest author-editor relationship. It was less satisfactory to have a system of refereeing in which the expression of opinion was limited ('suitable' or 'not suitable' for

acceptance) and papers were altered by a staff editor to fit them into a stereotyped scheme for the concise recording of data.

Dr. I. Bush (Oxford) complained of over-zealous editors and laggard referees who hold up publications while making numerous changes, which are not of the first importance, in the manuscripts. Editorial requirements are so numerous and various these days that many otherwise conscientious authors do not take the maximum trouble in preparing their manuscripts since experience leads them to believe that, whatever they do, the editors will always raise a large number of objections or alternatives. He pointed out that Dr. Detlev Bronk had recommended a decrease in 'editorializing' in an article some years ago.

Dr. T. H. Osgood (U.S. Embassy) said that in his American experience, the insensitivity of some authors to shades of meaning lent credibility to the story told by a fellow editor that occasionally his letters of rejection took the form: "Dear Sir, Although your paper fills a much-needed gap in the literature, I regret that it cannot be accepted for publication". It was unfortunate that editors were, on occasion, forced to undertake the education of authors, but when it became known that the correction of errors and the questioning of editorial judgment involved considerable delay, authors took exceptional pains to present good manuscripts. In view of the normal anxiety of an author to see his paper in print, the threat of delay was the best weapon for ensuring the effectiveness of editorial influence. An editor who did his job well must expect to make one or two enemies every year.

Mr. F. Clark (*Biochemical J.*) described the work of a professional editor, whose services may be required for large scientific journals where much of the editorial work formerly done by the chairman and other members of the editorial board can be transferred to the editorial office.

Dr. G. E. W. Wolstenholme (Ciba Foundation) said it is difficult for scientists from abroad to understand the requirements of journals in another country. Some scientists whose papers are rejected are convinced that the editors have a personal grudge against them.

This short meeting had shown how helpful it could be for authors and editors to get to know each other: in that way many mutual difficulties could be ironed out.

D. RICHTER

THE BRITISH RAYON RESEARCH ASSOCIATION

THE annual open days of the British Rayon Research Association's Heald Green Laboratories at Wythenshawe were held during May 11–13. The total attendance was 900. Last year the work on 'fluid beds' and on vibration problems on spinning machinery was not demonstrated, but, because of the progress made, it was possible to give impressive demonstrations of both these aspects this year.

In the 'fluid beds', on which the Association has been working for the past few years, the bed material is small glass beads (dimensions 1 mm.–0.25 mm.) and the fluidizing agent is air. The particular

virtues of fluid beds are: (a) that high rates of heat transfer can be achieved between a heat source in the bed and the material to be heated, for example, fabric or cord; (b) that the bed can be operated at high temperatures; and (c) that the temperature is uniform across the bed. Fabric or cord can either be introduced at the bottom and removed from the top of the bed (single-pass bed) or both entry and removal can be at the top (double-pass bed), in which case it is passed round an internal roller or similar device at the bottom. The problem is to achieve this with low cloth tensions. The current position is that fabrics can be passed through single-pass beds under a tension

of 2-4 lb. per yard width per 6-ft. path-length in the bed and under a tension of 4-6 lb. for the same conditions in a double-pass bed. Much effort has gone into this development, and these tensions are sufficiently low for satisfactory treatment of cloth. Detailed measurements of heat transfer and rate of removal of water from cloth (drying) have been made as a function of bed temperature and rate of input of air per unit area of bed. There are therefore sufficient data available for a proper analysis of its possible use as a drying machine. For a number of practical reasons the most promising applications are the dyeing of hydrophobic fibres, such as nylon, 'Terylene', etc., and the heat treatment of tyre-cords of nylon or other thermoplastic materials. These two aspects have received the most attention during the past year, and demonstrations of the application of this technique to ribbon-dyeing and to the heat-setting of nylon tyre-cords were given.

The problem of how to give fabrics of continuous filament viscose rayon the same visual degree of crease-shedding as can be obtained on fabrics of spun-yarns has not been solved. The problem is more difficult to solve with these fabrics because, as their surface is so uniform, the eye can detect creases which would not be noticed in spun-fabrics; for example, to produce a visually acceptable fabric a higher degree of crease-recovery is necessary with these fabrics than with spun-fabrics. A systematic exploration of the effect of varying the parameters, for example, chemical nature of treatment, temperature of treatment, drying conditions, in known techniques of achieving crease-resistance has shown that there is a good correlation between crease-recovery and loss of abrasion resistance, that is to say, although it is possible to obtain the high degree of crease-recovery necessary, the associated reduction in abrasion resistance is such as to render the fabric valueless. It can be inferred, therefore, that all the treatments so far investigated which appear to increase the 'yield point' of the fibres, that is, the region of elastic deformation, simultaneously lead to a reduction in the breaking strain.

Two features of nylon have been investigated. The first one is the photo- and thermo-chemical degradation of nylon. This problem has been approached by studying the photo-sensitized oxidation of simple compounds, the N-alkyl amides, which should show the same chemical behaviour, in principle, as polyamides. With photo-chemical sensitizers, for example peroxides, it has been shown that the main reaction product is that which would be expected by analogy with previous work on alcohols and ethers:

It has been conclusively shown that N-acyl amides are the primary product for a large range of N-primary alkyl amides. An initial study of the thermal oxidation, over the temperature-range 110-180° C., has shown that the major products from N-ethyl and N-propyl propionamide are again N-acyl amides, that is to say, thermal oxidation would appear to involve a specific hydrogen abstraction, namely from the carbon α to nitrogen, either in the initiation or propagation stage.

The second feature of nylon which has been studied is the structure of spherulites grown from the melt. Narrow-beam X-ray techniques have been used to study orientation, and it has been shown that the a axis of the unit cell lies along the radius in positively birefringent spherulites. The zig-zag extinction pattern shown in the polarizing microscope by some of these spherulites can be understood in terms of this orientation and a structure in which successive crystalline units along a radius show a progressive rotation (twist) around this radius with an optically resolvable pitch. The orientations in negatively birefringent spherulites and in spherulitic aggregates have also been studied. Further work is being carried out by electron microscopy in order to characterize the geometrical nature of the crystalline units from which the spherulites are formed.

An essential stage in the production of textile fibres is drawing, which brings about molecular orientation and an anisotropy in physical properties. Apart from previous work on cellulose film in the Laboratories, no attempts have been made to investigate the anisotropy of the mechanical properties, although the behaviour of fibres under lateral forces may well be as relevant to obtaining an understanding of the physical properties of yarns and fabrics as the axial tensile properties which are usually measured. Using polythene film (see *Nature*, 184, 600; 1959), measurements of the Young's modulus of strips cut at three angles ($\theta = 0^\circ, 45^\circ$ and 90°) to the symmetry direction (direction of drawing) have been made. With increasing draw ratio at 20° C. the moduli at 0° and 90° to the axis of symmetry first decrease and then increase very markedly. This unexpected behaviour is not explicable in terms of a reduction in order, since density and molecular orientation (by X-ray measurements) increase monotonically with increasing draw ratio. Even more unexpected is the behaviour at $\theta = 45^\circ$. In this case the modulus decreases smoothly as the draw ratio increases. This behaviour of polythene differs markedly from that of cellulose, for which some less-extensive data are available, but it is clearly of sufficient importance to justify the investigation of other polymers in a similar way.

Apart from these investigations, aspects of much other technological work were on show. Of particular interest to the textile industry were the different types of slub-catchers for removing slubs from yarn, a demonstration of the effect of spindle eccentricity on ring spinning frames on producing hairiness in yarns, and the effect of pirn winding tensions and humidity conditions on the production of weft bars in nylon fabrics.

The number of staff of the Laboratories is 230, comprising research staff, 80; laboratory and technical assistants, 57; engineering, drawing office and maintenance staff, 52; library and administrative staff, 32; canteen staff, 9.

L. A. WISEMAN