

has found that, when temperature effects are eliminated, there is no evidence of significant lethal action on yeast cells, *Bacterium coli* or on bacteriophage. Earlier reports on the apparent success of the treatment must be attributed to heating effects. Dr. Hannan described sterilization experiments with high-energy electrons using an electron accelerator giving 0.1–15 MeV, or using gamma-rays from cobalt-60 with energies of 0.7 and 1.2 MeV. By irradiation from two sides the electrons can penetrate uniformly and effectively up to 10 cm. depth and the gamma-rays rather more deeply. Certain deleterious side-effects can be avoided by pre-freezing. Opinions are not in entire agreement on the actual lethal doses for micro-organisms, but in general  $0.2 \times 10^6$  roentgens kill vegetative bacterial cells, and  $0.5\text{--}2 \times 10^6$  r. bacterial spores; bacteriophage is more resistant than bacterial cells or enzymes. The dose required to kill is dependent on a number of factors, including the suspension medium and oxygen tension. The system appears to be economically possible and would have wide applications in the pharmaceutical field. In his paper on "Antibiotics in Food Preservation", Dr. Hirsch said that, in general, antibiotics have been used experimentally for the preservation of certain non-acid foods, the main organism to be dealt with being *Cl. botulinum*. Subtilin is of some value with canned peas, but in general the method does not appear to be practicable. Nisin has been used in cheese to prevent growth of *Clostridium* species (mainly *Cl. butyricum*); this antibiotic appears to be more effective in inhibiting germination of spores than development of vegetative cells.

Describing his observations on "The Microbiology of Raw and Heat-treated Liquid Egg", Mr. Knowles said that fresh-laid eggs are practically sterile internally, but low-grade eggs may contain many millions of bacteria per gram. On hard freezing, the viable bacterial population may be reduced by up to 55 per cent. Duck eggs are generally more heavily contaminated, carrying, in particular, *Salmonella* bacteria. By careful organoleptic control, the quality of raw hen eggs used for liquid egg preparation has recently been improved so that bacterial counts have been much reduced, and a suggested standard of less than  $5 \times 10^6$  viable bacteria per gm. would be meritorious. Heat treatment is carried out at 149–150° F. (65–65.5° C.) for three minutes in a modified plate pasteurizing plant. This reduces the bacterial count to less than 1,000/gm., but careful control is necessary to reduce coagulation deposits on the plates. Miss Scarr, in her paper on "The Microbiology of Sugar-preserved Foods", dealt particularly with the properties of osmophilic yeasts and moulds, and discussed the types usually found as contaminants and their adaptability. Spoilage occurs either through growth of these resistant organisms or from local dilution of syrups brought about by condensation in the surface.

Papers given at other sessions included three on the detection and classification of organisms of the coli-aerogenes group. The first, by N. P. Burman and C. W. Oliver (London), showed that Folpmer's glutamic acid medium is somewhat superior to MacConkey medium in detecting *Bact. coli* in water; another by T. Richards and M. T. A. Fouad (Reading) discussed the use of inorganic media containing glucose in the classification of the group, and a third, by S. B. Thomas and colleagues (National Agricultural Advisory Service), reviewed the sig-

nificance of the coli-aerogenes and *Bact. coli* assessments from more than 2,500 samples of farm waters. W. A. Hoy and L. F. L. Clegg (Shinfield) described a new test for dairy disinfectants using aged milk in soiled churns. Results obtained suggest that they might parallel those from longer-termed field trials. Miss C. Higginbottom and D. W. F. Wheeler (Hannah Dairy Research Institute) discussed the occurrence of *Streptococcus bovis* in rumen contents, showing that there is a significant increase during the first hour after feeding; Mrs. A. C. Stirling (Edinburgh) indicated the importance of lactobacilli in silage to ensure a rapid fall in pH value and so reduce nutritional losses.

From the public health aspect, A. Clarenburg (Utrecht) discussed the occurrence of *Salmonella* bacteria in meat. Outbreaks of poisoning from this source are usually traced to meat products rather than raw meats, and carrier animals increase the complications. E. B. Reid and M. Woodbine (Aberdeen) demonstrated the 'Pressfish' process for preparing vacuum-dehydrated foods and discussed the microbiology concerned, and a paper by S. E. Jacobs and Miss M. J. Thornley (Ambleside), on the effect of ultrasonic waves on bacteria suspended in milk, showed that treatment at 20 kW. or at 1 Mw. is only partially lethal to a variety of bacteria, increased protection apparently being afforded by the high protein content. A. M. Paton and T. Gibson (Edinburgh) described an improved technique for assessing microbiological lipase activity, and Miss J. P. Cowne and J. R. Postgate (Teddington) an improved medium for estimating sulphate-reducing bacteria by dilution counts. The normal medium is supplemented with sodium sulphide and cysteine or ascorbic acid, rendering sulphate-reducers easily detectable by the precipitation of black ferrous sulphide.

## INSTITUTE OF PHYSICS ANNUAL GENERAL MEETING

AT the thirty-second annual general meeting of the Institute of Physics, held on June 5 at the Institute's House, 47 Belgrave Square, London, S.W.1, the following were elected to take office on October 1: *President*, Dr. C. Sykes; *Vice-Presidents*, Mr. O. W. Humphreys and Dr. T. L. Ibbs; *Honorary Treasurer*, Dr. S. Whitehead; *Honorary Secretary*, Dr. B. P. Dudding; *New Ordinary Members of the Board*, Mr. H. Barrell, Dr. N. A. De Bruyne, Dr. W. H. Taylor and Mr. R. G. Wood. Prof. W. E. Curtis and Dr. F. C. Toy (past-presidents), Prof. E. G. Cox and Dr. J. Topping (vice-presidents), Mr. T. C. Keeley, Mr. G. R. Noakes, Dr. H. L. Penman and Prof. S. H. Piper continue to serve on the Board. Sir Owen W. Richardson was elected to honorary fellowship of the Institute.

The thirty-second annual report of the Board, covering the work of the Institute during 1951, was adopted at the meeting. It records that the Board met six times, and its various standing committees nineteen times, during the year. The membership increased by 222 to 4,080. Applications for election or transfer to the various grades of membership of the Institute received during 1951 numbered 524, compared with 627 in the previous year. There was a slight decrease in the number of subscribers and

students, but substantial increases in the numbers in the other grades, particularly in the recently established grade of graduateship. The regulations and syllabuses for the graduateship examination which were published during the year aroused wide interest, and the number of candidates for the first graduateship examination, held recently, was greater than was anticipated. The regulations governing election to the associateship grade were modified to permit the admission of candidates whose training in physics is adequate but who may have graduated in subjects other than physics.

The number of candidates who presented themselves for the 1951 examination for National Certificates in Applied Physics was substantially greater than in the previous year; twelve colleges entered candidates at the ordinary level and five at the higher stage. Nine technical colleges which have applied for recognition, or for an extension of recognition, as institutions approved by the Institute for the education and training of physicists, were inspected.

In 1949 the Board decided that the Institute should rapidly increase the volume of its publications, and although this development has been somewhat restricted by printing and other delays and the substantial rise in the cost of printing and paper, it has largely been implemented. In addition to its two journals, the *Journal of Scientific Instruments* and the *British Journal of Applied Physics*, and its monthly *Bulletin* to members, two further monographs in the "Physics in Industry" series were published. Other books published for the Institute (issued by Edward Arnold and Co.) were "Some Aspects of Fluid Flow" containing the papers presented at a conference organized by the Institute in October 1950; "Bibliography on Electron Microscopy", edited by Dr. V. E. Cosslett for the Institute's Electron Microscopy Group; and a further selection of laboratory and workshop notes from the *Journal of Scientific Instruments*, prepared and edited by Dr. Ruth Lang. A new development is the Board's decision to sponsor a series of small books suitable for university students and those studying for Higher National Certificates in Applied Physics, each of which will cover some branch of applied physics and be written by an authority in that field. It is hoped to launch the series shortly.

In addition to individual inquiries from members concerning professional matters, the Board has considered the Ministry of Labour's report on the supply of and demand for physicists, the right of travel for men of science and the part-time employment of retired members; and it has issued an informative report on the second survey of salaries and emoluments paid to fellows and associates of the Institute resident in Great Britain and Ireland. The Institute is represented on the Parliamentary and Scientific Committee and the Joint Council of Professional Scientists, and thus keeps in close touch with science in the government service and ensures that proper regard is given to the scientific point of view in the political sphere.

The fifteen local branches and specialist subject groups of the Institute held more than a hundred meetings during the year. Details of the various activities of the branches and groups are listed in the report. A new event was the very successful exhibition of scientific instruments and apparatus arranged by the Australian Branch in Melbourne, which attracted some four thousand visitors during the four days it

was open to the public. The Branch committee has given consideration to a proposal that an independent Australian Institute of Physics be established, and the Board of the Institute has intimated that, if this proposal should receive the support of the Australian members, it would welcome the development. The London and Home Counties Branch, under the chairmanship of Dr. A. J. Maddock, held a summer meeting at the Cavendish Laboratory, Cambridge, and an 'at home' at the Institute's House in October. The Education Group held meetings in Birmingham (in conjunction with the Midland Branch) and Manchester (with the Manchester and District Branch), together with a joint meeting at Cambridge with the Electronics Group, and a three-day conference in London; it also visited the Royal Naval College, Greenwich. The X-Ray Analysis Group held its usual two conferences, has continued its work on the extension of data for the card index of diffraction data published by the American Society for Testing Materials, and has published a memorandum on the preparation and mounting of polycrystalline specimens for X-ray analysis. It is interesting to note that the National Committee of Crystallography, on which the Board is represented, has directed the attention of the X-Ray Analysis Group to the fact that the fortieth anniversary of the discovery of X-ray diffraction falls in 1952. It has since been announced that a commemorative meeting will be held during October 24-25 at the Royal Institution (see *Nature*, June 7, p. 949).

## COST OF GERMAN MEDICAL AND SCIENTIFIC PERIODICALS

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THE exorbitant cost of German medical and scientific periodicals has once again become the concern of those who budget for university and other learned libraries. The cost of English periodicals has continued to rise, although slightly, owing to increased cost of publication; still more has the cost of American periodicals risen, not only on account of devaluation but also on account of similar production increases in the United States as well. But the cost of German periodicals has exceeded those to an alarming extent, and appears to be settling down at a figure which will make it impossible for many British libraries to continue their subscriptions.

A parallel situation arose after the First World War, and a united effort by those affected—conducted in the pages of *Nature*—succeeded in achieving a reduction of 20 per cent in 1933 and a further reduction of 25 per cent in 1935, conceded after a fall in value of the pound sterling. The pre-war complaints were not only of the excessive cost compared with that of British periodicals of a similar nature and size, but also of the impossibility of computing the annual cost, owing to irregularity in the number of volumes per year. This same state of affairs regrettably still obtains.

An analysis of costs of a selection of representative medical journals in similar subjects from Great