differentiation of the sex characters can occur. A condition of ovo-testes is frequently found amongst pigs either on one or both sides. The ovary is always cephalic and on the left side, showing that differentiation must take place from right to left and from cephalic to caudal poles. If the ovary was able to initiate the development, the animal would tend to develop female characters during its early days, the degree of maleness appearing later in life depending upon the extent to which the secretion of the slower differentiating testes was able to counteract the ovarian secretion. This would explain the tendency to maleness exhibited in the human by girls as they grow older. Macmillan's recent discovery of a chemical test for sex should prove useful in the solution of these problems.

Evidence that the ovarian extract as at present used is responsible for the slow ante-pubertal growth of the female sex-organs is not conclusive. The supposed hypertrophy is sudden, occurring within forty-eight hours, and it only produces the changes associated with œstrus. Injection into the new-born rat is without effect, while injection into the animal three weeks old produces œstral changes. Further, ovarian extract does not produce the psychical changes normally associated with the œstrus cycle. Parkes, from his investigations, concluded that the ovarian extract at present in use probably contains the responsible factor for the production of œstral changes, and that another substance is responsible for the pubertal and psychical changes.

Evidence was put forward by Glynn in the discussion for the supposed relationship of the suprarenal cortex to secondary sex characters. This evidence is summarised under the four headings :

(1) Embryological—Cortex of the suprarenal gland and the ovary and testis are derived from the same source.

(2) Physiological—Enlargement of the suprarenal glands during pregnancy.

(3) Pathological—In hermaphroditism there is bilateral enlargement of the suprarenals in the female.

(4) Clinical—Hypernephroma or tumour of the suprarenal associated with pseudo-hermaphroditism.

In females suffering from adrenal hypernephroma, there is often atrophy of the mammary glands, ovary, and uterus, with cessation of menstruation, alteration in metabolism, mainly fat metabolism, and a general tendency to increase the male primary and secondary sexual characters at the expense of the female.

Tumour formation in the adrenals leads to a profound disturbance of normal metabolic conditions, and it is possible that while the endocrine glands may exert no direct influence upon the secondary sex characters, yet they may have a pronounced indirect effect by bringing about abnormal conditions of metabolism. Crew has demonstrated that cockerels, fed on thyroid from the time of hatching, developed female colour and type of feathering. Further, gonadectomy and gonad implantation do not lead to any apparent change in the metabolism of the animal, and, after operation, the endocrine glands appeared to be normal. It appears probable, then, that the secondary sex characters are under control of the gonad secretion, but with abnormal conditions of metabolism, a new threshold for the differentiation of the tissues is established.

The British Association at Leeds.

THE general opinion on all hands seems to be that the meetings of the British Association in Leeds have been a great success; certainly from the point of view of the citizens of Leeds, they will be remembered as a fitting celebration of the arrival of summer. After the most dismal August in the recorded meteorology of the area, the meetings have heralded a change to sunny weather and blue skies, with that bracing keenness in the air that prevents lassitude. Whilst the excursions have thus been made doubly enjoyable, the weather has also been appropriate for the strenuous follower of sectional activities.

Comparatively few seats were empty when the president's address was delivered in the Majestic Picture Theatre. This meeting was noteworthy for the announcement by the president of the Council's support of a movement to purchase Charles Darwin's home and estate at Downe, so that it may be retained in perpetuity for the nation. The enthusiastic applause of the vast audience showed their cordial sympathy with the proposal. Sir Oliver Lodge, who, in the absence of the retiring president, H.R.H. The Prince of Wales, was in the chair and introduced Sir Arthur Keith, alluded in felicitous terms, as also later did the president himself, to the generous anonymous gift of £100,000 to the appeal fund of the University of Leeds—a sum to be devoted to the erection of the new library. The announcement of this gift in the press on the same day as the inaugural meeting naturally added to the general enthusiasm with which the proceedings were initiated, and gave added force to the vice-chancellor's hope, expressed in his opening remarks of welcome at the inaugural meeting, that on a future occasion the University may be then able to accommodate all the activities of the Association within its walls. It has since been announced that the University owes this gift to Sir Edward Brotherton, a well-known chemical manufacturer with works at Leeds and Liverpool, to whom the University was already indebted for a gift of £20,000 for bacteriological research. Sir Arthur Keith's reference to the possibility of acquiring Darwin's house at Downe has borne fruit, for an amount sufficient to purchase and maintain the house has been offered by Mr. G. Buckston Browne, whose name will be associated with this gift to the nation.

Both the University and the civic authorities have thrown themselves whole-heartedly into the work of entertaining their guests; the dinners

given to the president, vice-presidents, and other prominent members of the Association by the Lord Mayor and the vice-chancellor of the University being representative of a large amount of civic and private hospitality, in which neighbouring towns have also joined. Both York and Harrogate entertained large parties of scientific visitors right royally when the week-end permitted the members of the Association to scatter into various parts of the three Ridings.

One feature in the meeting that was perhaps particularly appreciated was the effort made to provide for the comfort of members on excursions. On all general excursions, besides the leader who explained the particular points of interest, another guide accompanied each party whose sole task was to consider the comfort of visitors, and in case of any emergency to see that arrangements were made to meet it without distracting the official leader from his duties.

Both the civic reception on Thursday evening and the University reception on the night of Tuesday, were very successful, if crowded, functions. Particular distinction was given to the civic reception by the presence of H.R.H. Princess Mary, Viscountess Lascelles, to whom a number of prominent citizens, vice-presidents, members of the Council, and officials of the Association were presented. Princess Mary afterwards made a tour round a number of the beautiful rooms of the Art Gallery which were thrown open to the throngs of visitors on this occasion.

Perhaps the most striking feature of the University reception to the visitors was the vast extent and elaborate equipment of the technological departments of the University which were thrown open for their inspection with a large amount of the full scale machinery in operation. Visitors were then able to see industrial processes, such as dyeing, manufacture and treatment of leather, spinning and weaving, etc., carried out upon a manufacturing scale and at the same time worked in conjunction with intensive scientific investigation.

On Friday night a most successful dance was held in the Dance Hall of the Majestic Picture Theatre. The Lord Mayor's party, which included the president of the Association and the vice-chancellor of the University, attended after a dinner given by the Lord Mayor in the Town Hall, whilst Sir Oliver Lodge was to be seen with the party coming fresh from listening to Prof. Millikan, who had been giving the first of the evening discourses to a large audience in the Albert Hall. Sir Oliver danced nearly every item of the programme, and many citizens of Leeds present on this and other social occasions of the meeting will probably have gained quite a different conception of the human side of the scientific members of the community from that usually held, as a result of this and similar light incidents of a notable scientific assembly.

SCIENTIFIC APPARATUS AND DEMONSTRATIONS.

During the week of the meeting, demonstrations were given of Mr. J. L. Baird's television and 'noctovision' apparatus. The latter (which employs infra-red radiation in the place of light) is regarded by the inventor as likely to be of commercial value at an earlier date than the former, since he hopes to apply it to navigation in fog. The reproductions are at present comparable with those obtained with the earliest kinematographs, and are marred by flickering and coarseness of detail, but the inventor has in view some solutions of the outstanding problems which may well prove successful, like those adopted in the earlier art. Whether or not Mr. Baird will be victorious in the competition with formidable foreign rivals which lies in front of him is a matter for speculation, but at least a tribute of admiration must be paid to the ingenuity, courage, and enterprise of a British inventor who has achieved considerable success in the teeth of great difficulties. An indulgent view may therefore be taken of some aspects of the exhibits which were more relevant to the popularisation of the invention than to its technical development.

An exhibition of apparatus in the crypt beneath the Reception Room formed a valuable addition to the proceedings of the Association. The exhibition was generally similar to, though on a smaller scale than, that held annually in London by the Physical and Optical Societies, and it is to be hoped that such an exhibition will become an annual feature of the meetings, since it enables scientific workers from all parts of the country to see some of the latest improvements in scientific apparatus. It is of course impossible to mention many of the most interesting exhibits, but a word must be said of that contributed by the Lancashire and Cheshire Coal Research Association, which included some most interesting fossil remains illustrating the natural history of coal, in addition to preparations and samples of coals and their ingredients. A wool research reflector for assuring even illumination in colour comparisons was attributable to the Woollen and Worsted Industries Research Association, but research associations generally did not take this opportunity of illustrating their work for the benefit of fellow-investigators and others likely to be interested in it. Amongst the more recent applications of science to practical purposes, the use of an analytical quartz lamp for such purposes as the testing of bank notes and the examination of palimpsests was illustrated. The emitted radiation is restricted by a filter to a band in the neighbourhood of 3660 Å.U., and the fluorescence produced gives a sensitive indication of slight variations in the irradiated surface. Another interesting exhibit was a refrigerator without mechanical moving parts, a quantity of captive ammonia being forced through a repeating cycle of condensations and evaporations merely by the application of heat to one vessel and of cooling water to another connected with it. Refrigeration is effected by evaporation produced by mixing the liquid ammonia with hydrogen.

Visitors to Leeds this year had an opportunity of making themselves better acquainted with a medium which is already finding its place in the service of education, namely, broadcasting. Many

people are coming to feel that what the school of to-day most urgently needs is enrichment, and this topic was the theme of many discussions in Section L (Education). In fifty years we have evolved a machine capable of high efficiency in turning out pupils reasonably well equipped for beginning to acquire knowledge, but still there are those masses who must leave school at 14 years of age with only the dimmest perception of the treasures of science and art that are their rightful inheritance. Let any one who doubts this study the text books in use in the public elementary school or hear their musical instruments or ask to see their scientific apparatus, or their playgrounds. But those who see the deficiencies most acutely are in despair at the cost of providing a proper equipment under present economic conditions, and it is for this reason that they are turning their attention to a new means of enlarging the scope of a school however remote and enriching its resources without excessive cost.

At the Reception Room, some hundreds of people were able to hear the special programmes arranged by the British Broadcasting Corporation to enable schoolmasters and others to judge how clearly and naturally broadcast matter can to-day be presented in the class-room. At the University a large room was divided into two parts, one of which represented a model studio, while the other did service as a class-room. A large number of members visited these rooms during the week, especially during the evening of the reception, and there were many who appreciated, perhaps for the first time, the extent to which it is possible for a speaker to project his personality into a room full of people, even when the appeal that he makes is to the auditory and not to the visual sense. Some thousands of schools are now listening regularly to these transmissions, using them to supplement the ordinary curriculum.

The new programme and syllabus of transmissions to schools and the provisional programme for adult transmissions are now ready and can be obtained from the British Broadcasting Corporation on application.

In connexion with a paper on the slaughtering of animals for food, a demonstration was given by the Royal Society for the Prevention of Cruelty to Animals in the municipal slaughter-house. After 12 pigs, bullocks, calves, and sheep had been dispatched with a captive bolt pistol (humane killer) a local butcher who was opposed to this instrument asked permission to demonstrate the use of the poll-axe on a bullock. The first blow of the axe proved ineffective, and a second had to be given before the bullock was felled.

TEXTILE RESEARCH.

As was fitting for a meeting held in Leeds, special provision was made for the discussion by the sections concerned of textile problems. The British Research Association for the Woollen and Worsted Industries issued a 48-page pamphlet by Dr. S. G. Barker and A. Frobisher dealing with its origin, constitution, and work in connexion with the special meetings arranged for the discussion of textiles. The Association is of firms engaged directly or accessorily in the woollen and worsted industries, and its headquarters are in Leeds. Among the most debatable of textile problems is that of the 'quality' of the raw material, the fibres. Judgment based upon the observations of sight and touch and crystallised by experience, grades cotton, classifies wools and tops, and selects silks with an accuracy that has sufficed for many generations of manufacturers and will no doubt continue to do so, at least to some extent, for many years to come. But science holds no realm that admits of investigation too sacred or too unfruitful for such investigation, and elasticity tests, grease estimations, diameter measurements, staple lengths, all now contribute to a more accurate, more trustworthy estimation of 'quality,' though the writers of this pamphlet wisely state that "the precise factors affecting quality as regards spinning are as yet unknown," and again, "one of the outstanding problems in wool research is the investigation of the precise definition of the term 'quality.'" The amount of work being done upon a determination of the measurements and properties of wool fibres may be gauged from a list of the headings under which the chemical aspects of the problem are surveyed—the action of acids, alkalis, and soaps; the estimation of alkali and of sulphuric acid; the sulphur content; bleaching and chlorination; and the action of ammonia; and the chemical decomposition of wool at 100° C.

The physical properties of wool have also been the subject of carefully thought out investigation, and the work of Dr. Shorter, at one time on the staff of this Association, is sufficiently well known to need but mention. Since his departure, the work of evaluating the properties of wool—regarded as an amphoteric colloid—has proceeded apace, and elasticity, regain, thermal conductivity, and electrification are topics of investigation noted in the work of the Association's physical laboratory. The action of bacteria and mildews upon wool has also been the subject of, at any rate, preliminary work, though in these aspects as well as the chemical and physical aspects the work is described as "only a beginning of the attack on the great problems." "The scientific side must be closely related to the technical or trade side, and valuable as the scientific data are, yet the object of their discovery must be their application to the industry." The Association's claim that this point is ever to the fore in its work is well substantiated, and the relationship of the previously determined chemical and physical properties to such technical problems as the migration of alkali when scoured cloth is drying off from the damp state and the faults engendered thereby in subsequent processes, notably dyeing, wool scouring, the elimination of tar-marking and branding, and the all-important subject of the fading of dyestuffs, are all instances of this type of valuable work.

The comprehensive lecture delivered by Dr. S. G. Barker on the subject of the fading of

dyestuffs made it clear that here was a piece of work of which much has been done, but of which much—the greatest part perhaps—yet remains to be done. Work yet closer to the trade processes has also been done, and apparatus likely to be of general use has been devised; the Research Association stroboscope may be mentioned in this connexion. The list of publications of the Association which, with a plan of its buildings, concludes the pamphlet, is an excellent indication of the comprehensive character of its work, and it is perhaps regrettable that the liaison between those engaged in pure science and those in technical research is not stronger and more generally established. No doubt wider publication of the work of research associations might help materially in this respect.

Honorary Degrees.

In a congregation of the University of Leeds in the Great Hall on Tuesday, Sept. 6, at 12 noon, the following honorary degrees were conferred:—*LL.D.*: Sir Arthur Keith, Conservator of the Museum and Hunterian professor of the Royal College of Surgeons of England; Her Grace the Duchess of Atholl, Parliamentary Secretary, Board of Education; The Hon. Sir Charles Parsons. *D.Sc.*: Prof. J. S. Haldane, honorary professor and director of the Mining Research Laboratory, Birmingham University; Dr. N. V. Sidgwick, reader in chemistry in the University of Oxford; Prof. F. O. Bower, emeritus professor of botany in the University of Glasgow; Dr. R. A. Millikan, chairman of the Executive Council of the California Institute of Technology and Director of the Norman Bridge Laboratory of the Institute. *Ph.D.*: James Graham, Director of Education, Leeds.

Report of Council.

The report of the Council presented to the General Committee on Aug. 31, expresses profound gratitude to Sir Alfred Yarrow for his munificent gift of £10,000 to the funds of the Association for general purposes, and accepts the wise condition that the gift should be expended as to both capital and interest within twenty years.

The Council has had under discussion with the Board of Trade the question of the duty required by H.M. Customs on the introduction of kinematograph films into Great Britain for scientific purposes and not intended for commercial uses. The matter was referred to the Lords Commissioners of H.M. Treasury, from whom a reply was received that "having regard to the impracticability of framing a statutory exemption which would be free from grave difficulties of definition and administration," they were unable "to submit to Parliament proposals of the nature desired by the Association."

Reference is made in the Council's report to the two conferences called to consider the possibility of establishing a Science News Service. The essential condition for success of such a scheme is that scientific societies and institutions themselves should desire its organisation.

In view of the lack of unanimity and of enthusiasm evinced at the two conferences, the committee appointed to indicate the ways in which this support might be given, considers that no useful purpose would be served by communicating with the scientific societies. The opinion is expressed, however, that should sufficient funds be forthcoming for the establishment of a Science News Service, the Council of the Association—possibly in co-operation with the British Science Guild—might appropriately undertake the organisation of the service.

The Council has had under consideration the question of inviting "the co-operation of the British Science Guild in considering whether, having regard to the close community of scientific interests between the Association and the Guild, their objects would, as the Council believe, be more fully attained by means of a working union between the two societies; and if so, by what means such union would best be given effect." A joint committee of the two bodies has prepared a report in which the general methods by which such a fusion might be effected are stated. This report came before the General Committee of the Association on Sept. 6, when it was decided that the Council be authorised to continue the negotiations and report to the meeting of the General Committee at Glasgow.

Next year's meeting of the Association will be held at Glasgow under the presidency of Sir William Bragg. The meeting in 1929 will be held in South Africa, and invitations have been received to meet at Bristol in 1930 and Leicester in 1932.

Obituary.

Prof. H. R. Procter, F.R.S.

HENRY RICHARDSON PROCTER, born at North Shields in 1848, was the son of a tanner, a member of the Society of Friends. He was educated at Bootham School and received his scientific training at the Royal College of Chemistry and the School of Mines. He entered the tanning industry and remained on Tyneside until 1891, when he was invited to the Yorkshire College, Leeds, to take charge of a new department to be opened there in the special interest of the leather industry. In this Procter achieved distinguished success, and his work afforded as fine an example as could well be cited of the part which applied science may properly take within the circle of university studies. Students came to Procter from all parts of the world. He was a thorough man of science, an eager and fruitful investigator, and an excellent teacher. He gave to the industry the means of scientific control and development in many directions, and placed his discoveries freely at its disposal. His text-books have long been the standard works in the science of leather manufacture.

Though Procter's scientific studies were centred