

the Central Publication Branch, Calcutta (pp. 82, 2s. 6d.). Statistics of enrolment of students show that the rate of expansion was much slower than in past years, whilst in the higher stages (post-secondary education) there was a decrease by 5 per cent, from 83,334 to 79,225. The prevailing financial stringency and economic depression coupled with the laxity of discipline engendered by the civil disobedience movement are mentioned in this connexion. The number of females under instruction, 2,375,593, shows an increase in all stages and now represents 1.8 per cent of the total female population, whilst for males the corresponding percentage is 7.36. The standard of instruction in the secondary stages is said to be slowly rising, at any rate in Government institutions. The use of the vernacular as the medium of instruction and examination is increasing and inspectors complain that since the change of medium was introduced the standard of written and spoken English has deteriorated. As regards primary schools, the most striking feature of the returns is the extent of wastage, especially in the first year, the number of pupils in class 2 being 2,124,478 as compared with 5,266,579 in class 1. The need of a clearing house for educational ideas and a medium for the diffusion throughout India of new methods has been felt since the abolition in 1923 of the Central Advisory Board of Education and Bureau of Education, and the Government has decided to revive them as soon as financial conditions improve. The report is disfigured by surprising clerical errors in the summary of statistics of education in rural areas on p. 3.

LONDON'S evening lectures and classes for teachers form an important part of its educational system, being designed to bring teachers into touch with the latest developments in educational methods, to give them opportunities of hearing leading authorities in various branches of learning and on current questions of importance. The London County Council's recently published handbook of its lectures and classes for teachers for the session 1933-34 gives particulars of 83 evening courses, most of which have a direct bearing on the problem of adapting instruction in the schools to the task of direct preparation and training for work and leisure under present-day, and probable future, industrial and social conditions. The pamphlet also gives useful publicity to courses, specially suitable for teachers, held by the University Extension Committee of the University Extension and Tutorial Classes Council of the University of London, and particulars of some daytime courses in physical education. Among the L.C.C. courses of outstanding interest are the following: on design in applied art and in pictorial art, by Dr. Roger Fry, Slade professor of fine art in the University of Cambridge; the Cizek method—its principles and application in the technical training of selected and unselected children respectively and adults, by Miss A. Philip Smith; physiology and hygiene for teachers in senior schools, by Prof. Winifred Cullis; international economics for the layman, by Sir Norman Angell; problems in human geography, by Prof. C. B. Fawcett; the League of Nations, by Mr. Wickham Steed; the European situation, by Dr. G. P. Gooch. It is noteworthy that no less than twenty of the courses fall within the category of art and handicraft. The science courses are characterised by an obvious design on the part of those who framed them to broaden and vitalise instruction in science.

Calendar of Nature Topics

Harvest Moon

In consequence of its orbital motion round the earth, the moon rises and sets later each day. The average difference from day to day is about 48 minutes, but owing to the difference of about five degrees between the plane of the moon's orbit and that of the earth's equator, the intervals between the times of rising from one day to the next, and between the times of setting, vary widely. Near the autumnal equinox the difference between the times of successive risings may be less than 15 minutes for several days about full moon. In 1933, for example, the moon is full on October 3 and the time of rising changes only from 4.33 p.m. (G.M.T.) on September 30 to 5.23 p.m. on October 4. This phenomenon is known as the 'Harvest Moon', because in early times it was believed to have been specially ordained to facilitate the gathering of the crops, but the name is probably associated also with the optical illusion which causes the rising full moon, seen near the horizon through the slight mistiness characteristic of fine weather in autumn, to appear unusually large, a symbol of plenty.

October Rains

In a normal year, the end of summer in England sees the soil moisture depleted by evaporation and the demands of crops or other vegetation. During the present century, September has been generally dry, and the replenishment of the underground supplies begins with the heavy rains of October. Although in this month cyclonic depressions are not quite so numerous or intense as in winter, the south-westerly winds associated with them are heavily charged with moisture from the Atlantic, which still retains much of the heat of summer, and the 'cyclonic rainfall' associated with these depressions makes October the rainiest month over the greater part of England. The only exceptions are mountain districts, where the stronger winds of winter give a heavy 'orographic' rainfall in December, and a few low-lying places in the east or Midlands where thunderstorms give a maximum rainfall in July or August.

Beetles and St. John's Wort

Beginning in September and continuing until February, individuals of the St. John's wort beetle (*Chrysomela hyperici*) lay their eggs upon the young under-shoots of the plant after which they are named. The eggs hatch in spring and early summer, and the larvæ, like the adults, which appear about July, feed ravenously upon the plant upon which they were born.

This restricted diet has been the reason for the selection of *C. hyperici* and its congeners *C. varians* and *C. brunsvicensis*, in an attempt to control one of the serious pests of Australian grazings. The pest began, as so many begin, in an unforeseen and innocent way. About 1880 a German lady obtained from her fatherland seeds of St. John's wort (*Hypericum perforatum* var. *angustifolium*), and planted them in her garden near Bright. From the garden the plant invaded and flourished upon the adjacent racecourse. The racecourse became the source of much evil. By

1902 the weed had covered some 8,000 acres, by 1905 more than 10,000 acres, and by 1916 the infested area in Victoria was estimated at 184,000 acres. To-day, Messrs. G. A. Currie and S. Garthside say in their Progress Report on St. John's wort control that the infested area in Victoria alone is estimated variously at 250,000 to 400,000 acres, while smaller areas in New South Wales and South Australia have been occupied by this weed pest.

Chrysomelid Beetles introduced into Australia

In Britain, St. John's wort has not run riot as in Australia, and the supposition is that the beetles named in the preceding paragraph may have played an important part in keeping it within bounds. It seemed possible, therefore, that in Australia these beetles also might prove useful enemies of the introduced weed. Aware that introduced animals have more often proved a curse than a blessing, Dr. R. J. Tillyard and his staff made careful investigations in Great Britain and in Australia to discover whether the St. John's wort beetles were able to survive on plants, particularly plants of economic value, other than the normal food-plant. Adult beetles and larvæ were enclosed with the plant to be tested and were allowed to feed upon it or complete a passive resistance and starve to death. Forty-six plants were tested in England and in no case did the beetles feed upon any.

The way was now clear for the transference of beetles from Britain to Australia, and shipments were begun in 1929 and 1930. There they were bred, and a new series of tests on Australian plants taken in hand. Forty plants were thus tested, and on none did the beetles feed. The beetles were liberated in October 1930 in various places where St. John's wort grew densely, and although survivors of the first liberation were found five months later, it was still too early, when the Report was published in 1932, to say whether the beetles were likely to establish themselves in numbers sufficient to effect destruction of the weed.

Manx Herring Shoals

Herring shoals which begin to arrive in Manx inshore waters in the Irish Sea in May, remain there until September, which sees the end of the fishing period. Herrings which are actually spawning are seldom taken by boats in Manx waters, probably owing to their nets not being deep enough, but offshore, spent fish in goodly numbers are taken from the middle of September onwards. The older fishes, which have spawned in previous years, do not arrive in Manx waters until their gonads are almost ripe, and they spawn during September.

W. C. Smith (Report of the Lancashire Sea Fisheries Laboratory, No. 40; 1931) describes the Manx herring shoals during the seasons of 1929, 1930 and 1931. Inshore migration becomes appreciable in mid-June, although it may be delayed until mid-July, and reaches a maximum at the end of July. Herring do not arrive in the offshore ground until mid-August, where fishing is good for a month. These shoals consist in the main of 'full' herrings more than three years old, with sixth year fish most abundant. It appears certain that a herring spawning ground is situated close to the Calf of Man.

Societies and Academies

LONDON

Institute of Metals (Silver Jubilee Autumn Meeting at Birmingham), September 18-21*. O. F. HUDSON: Wear in the polishing of plated and other surfaces. The following materials, using magnesia on wet parchment as the polishing medium, were examined: pure platinum, pure palladium, platinum plating on brass, palladium plating ('soft', 'hard', and burnished) on brass, nickel plating ('soft' and 'hard') on brass, silver plating, and brass (60:40). Considered as loss of thickness, the rate of wear of the palladium-plated specimens was found to be greater than that of the platinum-plated specimens, but considered as loss of weight, the wear of the palladium coatings was slightly less than that of the platinum coatings; whilst the precious metal coatings generally were more resistant than the same metals in massive form. W. HUME-ROTHERY: A graphical method for converting the weight percentage compositions of ternary systems into atomic or molecular percentages. The method is suitable for use where 60° ruled triangular paper is available. It permits the direct transference of a triangular diagram drawn on the weight percentage scale to one in atomic percentages, and the accuracy obtained is of the order 0.1-0.5 per cent, according to the precision of the instruments and of the ruled paper. BRINLEY JONES: Preparation of lead and lead alloys for microscopic examination. Time devoted to preliminary polishing is restricted, the true structure of the metal being revealed by chemical solution of surface layers. After the removal of recrystallised layers, sections may finally be prepared for high-power examination by a treatment of alternate polishing and etching, the final polishing being vigorous. D. G. JONES, L. B. PFEIL and W. T. GRIFFITHS: Precipitation-hardening nickel-copper alloys containing aluminium. The properties of nickel-copper-aluminium alloys with nickel contents from 10 to 45 per cent and aluminium contents up to 4 per cent have been investigated. The relationships between composition and capacity for hardening by heat-treatment have been studied by means of hardness tests on the heat-treated specimens. A study has also been made of the most suitable heat-treatments to produce the soft condition, and the stability at elevated temperatures of a selection of the alloys in the precipitation-hardened condition. H. O'NEILL, G. S. FARNHAM and J. F. B. JACKSON: An investigation of the heat-treatment of 'standard silver'. The precipitation-hardening of quenched 'standard silver' (7.25 per cent copper) has been investigated by Meyer hardness analysis. Precision X-ray spectrograms obtained with Cu-radiation from thick disc specimens of the heat-treated alloy indicate that surface preparation may considerably affect the lattice parameter results. Polishing should be avoided in this work, and etching may have bad effects. Quenched 'standard silver' when reheated for 30 minutes in the 300° C. region is in a sensitive condition, and appears to precipitate completely when deformed. If precautions are taken, the lattice parameters indicate a normal progressive precipitation of copper constituent as the quenched alloy is reheated at increasing temperatures. D. STOCKDALE: The constitution of the aluminium-

* Continued from p. 490.