

experience has shown that ploughing is preferable to surface harrowing, and that seed-bed consolidation is essential for success. The suitability of mixtures for re-seeding, and the chemical aspect of grassland improvement are also considered. An article on ensilage and grass drying completes the other side of the picture, the different methods of conserving grass and their relative feeding values being fully described and discussed. Among other subjects of current interest in this number of the *Journal* is a well-illustrated account of a new method of trapping and destroying rabbits on a large scale. The *Journal* is now to be issued half-yearly instead of quarterly.

#### Vocational Training and Black Rust Control

THE classical struggle of the United States Department of Agriculture against the black rust disease (*Puccinia graminis*) of small grains, forms the subject of a leaflet (No. 1, Revised 1939) entitled "Teaching the Control of Black Stem Rust of Small Grains in Vocational Agriculture Classes". This has been prepared by the Vocational Division of the Office of Education, U.S. Department of the Interior. Destruction of common barberry, the alternative host plant of the fungus, still requires to be practised, and a teaching plan for the portrayal of this need is detailed in the leaflet. The life-history of the fungus and its devastating effects are shown by effective diagrams and small photographs, and even the most unimaginative teacher could scarcely fail to thrill a class if he followed the suggestions put forward. Co-operation with the U.S. Department of Agriculture has been closely maintained, with the result that a valuable source of specialist information is provided for the general teacher.

#### Animal Husbandry in India

THE report has just been published of the *Proceedings* of the third meeting of the Animal Husbandry Wing of the Board of Agriculture and Animal Husbandry in India (Simla: Gov. India Press, 1940). The meeting was held at New Delhi during February 20-23, 1939, and the variety of the nineteen topics discussed indicates the complexity of India's problems and the research activities which have been stimulated through the influence of the Imperial Council of Agricultural Research. Reference to the *Proceedings* and the discussions recorded there show how valuable to the investigators and agriculturists concerned must be the pooling of information from all the corners of the land which takes place at such meetings and helps to determine the lines upon which particular investigations must be conducted. But we must add that the form in which the *Proceedings* are published leaves much to be desired: there is no index to the subjects or authors mentioned in these 307 pages, and even the list of topics has no page references to guide the inquirer; so that, for example, we find the discussion on the warble-fly on p. 88, and the introductory remarks on which the discussion was based on p. 155, with a title which, as printed, is unintelligible.

#### Pictorial Illustration for Engineering Draughtsmen

IN the drawing office a rigidly conventional system of orthographic projection is employed which tends towards the suppression of ability in pictorial representation. To the draughtsman himself his conventional views are sufficiently expressive and communicative, but occasions arise when greater realism is necessary in order to inform and impress the uninitiated. For guidance in this unaccustomed field, the Association of Engineering and Shipbuilding Draughtsmen has issued a new publication entitled "Freehand Drawing and Pictorial Illustration for Draughtsmen" by W. H. Kerry and E. W. Stott (London: The Draughtsman Publishing Co., Ltd. 2s.) which shows how in a number of typical cases pictorial sketches can be prepared. A chapter devoted to "Perspective Construction", on which the subsequent treatment is based, is followed by a statement of the nature and classes of work which the engineering draughtsman may be called upon to treat pictorially, and the purposes for which this method of treatment is necessary; as, for example, the illustrations required by the Patent Office. The main subjects are dealt with under the titles "Treatment of Machine Details", "Conventional Treatment" and "Illustration for Reproduction with an Outline of some of the Printing Processes", and the whole forms a sequence of practical instruction which must prove invaluable to the draughtsman who is unskilled in this unfamiliar field and uninformed regarding the methods to use for different conditions of reproduction.

#### Properties and Applications of Witherite

IN *Engineering* of September 13 there is an interesting article on the properties and applications of witherite (barium carbonate). It is stated in a handbook issued jointly by the Holmside and South Moor Collieries, Ltd., and the South Moor Collieries, and the Settlingstones Mines, Ltd., that witherite is found in economic quantities only in the northern part of England and that the mines producing it supply the world demands for the mineral. The material derives its name from that of Dr. W. Withering, a Birmingham physician and amateur geologist, who in 1784 when examining samples taken from an old lead mine at Alston Moor, on the borders of Cumberland and Northumberland, first recognized the mineral to be chemically distinct from barytes.

Large quantities of witherite are used annually in the preparation of precipitated barium sulphate (permanent white) which is employed in the paper industry for the manufacture of highly glazed coated papers. It is also used in the printing ink and colour industries, in the manufacture of paints and as a filler in the rubber, linoleum and other industries. Among other engineering applications of witherite is the softening of water for boiler feed. It is specially useful when scale-forming and corrosive waters are encountered. Thus sodium and calcium sulphates are converted into the carbonates of these metals, with the precipitation of insoluble barium sulphate. Ground witherite mixed with wood charcoal, usually