SCIENTIFIC NOTE

A technique for the study of insect-borne pollen.—Fuchsin glycerine jelly provides a method of transforming insect or stigma-borne pollen into a semi-permanent mount *in the field*. All that is required is a container of jelly, a needle, microscope slides, cover slips and a spirit lamp and the preparations can be made very conveniently and very rapidly. For example, often the best method of identifying insect-borne pollen is to make a set of reference mounts while actually in the habitat under study.

The basic material for this technique is fuchsin glycerine jelly. The usual method of preparation is a modification of that described by Kisser (1935, Z. wiss. Mikr., 51: 38–40). The ingredients are: distilled water 175 cc., glycerine 150 cc., gelatin 50 gm., crystalline phenol 5 gm., and crystalline basic fuchsin stain. The gelatin is added to the distilled water in a large beaker and heated until dissolved. The glycerine and phenol are then added and the whole mixture gently warmed and stirred. Add basic fuchsin crystals to obtain the strength of color desired; I find that the color of claret stains most pollen grains very clearly. Too dark a color may obscure morphological detail and too light a color may not highlight such detail sufficiently. The decision on the strength of color *does* depend upon the type pollen of grains likely to be encountered. For example, Compositae pollen frequently absorbs very much stain, hence a standard (claret) or a weaker color is often desirable. The contents of the beaker, which now resemble gore, must be filtered through glass wool into containers and left to set. Remember the need to prevent contamination: containers should be completely clean and then sealed once the jelly is in place. Sterile plastic petri dishes are perhaps the most useful containers.

Basic fuchsin is not the only stain that can be added, it just happens to be a good general stain. Others may be added provided that they are soluble. Ruthenium red has been used to stain the intine of pollen grains and fast green has also been tried as a general stain.

A small cube of jelly is placed beside the pollen sample on a clean slide which is then warmed very gently over a spirit lamp until the jelly melts. In the interests of a pure sample use a flamed needle to dissect the jelly from its container. Do not overheat the preparation or the mountant will denature and become unmanageable. Inversion of the slide over a glass cover slip makes a thin, bubble-free, semipermanent mount. The stain is absorbed very rapidly so that by the time the preparation is placed on the microscope stage the grains are clearly colored. The time taken to absorb stain can be useful in distinguishing between difficult pollen species.

The beauty of this technique is that parts of insects (and sometimes whole insects) and parts of flowers, especially intact stigmas, can be mounted with the pollen *in situ*. Insect integuments and floral tissue normally do not absorb the stain hence pollen grains are instantly conspicuous in the preparation. I have mounted whole styles direct from fresh flowers and whole flies taken in mid-visit to a flower.

To remove pollen from an insect a small needle spearing a blob of jelly can be applied to the integument. The jelly is then transferred to a slide with the pollen adhering to it. Slight warming of the blob can help to trap all the pollen. In this way individual groups of grains can be precisely identified and analysed.

—A. J. Beattie, *Stanford University, Stanford, California 94305.*

BOOK REVIEWS

Invertebrata Pacifica, Vol. I, pp. 1–197, 1903–1907. Edited by C. F. Baker. Reprinted 1969 by E. W. Classey Ltd., Hampton, Middlesex, England. Available from Entomological Reprint Specialists, P. O. Box 207, East Lansing, Michigan 48823. $10.80.

Invertebrata Pacifica was a rather short-lived serial publication which was initiated by Charles Fuller Baker in 1903, the year of his arrival at Pomona College.

On accepting a position with the Estacion Agronomica Santiago de las Vegas, Cuba, in 1904, Baker continued his editorship but abandoned the publication when he returned to Pomona College in 1908. He was an enthusiastic and tireless collector of insects and this trait is evident in the content of the publication which is based mostly on material collected by Baker in California, Nevada, Mexico, Guatemala and Nicaragua. It contains descriptions of approximately 245 new species and 7 new genera by C. F. Baker, A. P. Morse, D. W. Coquillett, J. J. Kieffer, Peter Cameron, J. A. G. Rehn, Nathan Banks and J. C. Crawford.

The reprint edition of this difficult to obtain series was produced by photo-offset and thus preserves the original format and pagination. The paper is of good quality and the workmanship in the book cloth binding is fair.—Marius S. Wasbauer, *California Department of Agriculture, Sacramento.*

The Kodiak Island Refugium, Its Geology, Flora, Fauna and History. Thor N. V. Karlstrom and George E. Ball, Editors. The Ryerson Press, Toronto, for the Boreal Institute, University of Alberta, Edmonton. xiv + 262 pp., 28 figs., 21 tables, 1 pl. 1969. $10.00.

This is a stimulating multidiscipline study of the significance of the biota of a refugium, a nonglaciated area which presumably acted as a refuge while the surrounding areas were ice or snow covered for long periods. Chapter 7 is of particular interest to entomologists.

There is a Foreword by J. J. Bond, a Preface by Ball and Karlstrom; the book proper is divided into five Parts. Part I, an Introduction by Karlstrom, and Chapter 1, The biological importance of Pleistocene refugia, by Carl H. Lindroth. Part II gives the Regional setting and geology of the Kodiak Island Refugium, by Karlstrom. Part III comprises the Botanical investigations of the same area, with four chapters by as many authors. Part IV is largely entomological: Chapter 7, An annotated list of invertebrates of the Kodiak Island Refugium (Lindroth and Ball). Chapter 8, The species of the subgenus *Cryobius* of the Kodiak Archipelago (Ball). Chapter 9, An analysis of the carabid beetle fauna of the Refugium (Lindroth). Chapter 10, The fishes of the Kodiak Island Refugium (J. D. McPhail). Chapter 11, Origin of the terrestrial mammalian fauna of the Kodiak Archipelago (R. L. Rausch). Part V: Concluding remarks concerning the importance of the Kodiak Island Refugium for the survival of the biota (Lindroth).—Hugh B. Leech, *California Academy of Sciences, San Francisco.*