now[6] showed that the assumed β-hydroxyethylpyridine derivative of both workers was in reality the α-hydroxyethyl derivative. The true isoster of thiamine has, therefore, not been described, and we wish to report its synthesis at this time.

Ethyl α-(β-ethoxyethyl)-β-aminocrotonate condenses smoothly with diethyl malonate in the presence of sodium ethoxide[7] to give 2-methyl-3-(β-ethoxyethyl)-5-carbethoxy-4,6-dihydroxypyridine. Elimination of the carbethoxy group in this substance by saponification and decarboxylation and of the hydroxyl groups by replacement by chlorine and subsequent catalytic reduction of the dichloropyridine gave 2-methyl-3-(β-ethoxyethyl)-pyridine (picrate, m. 63–64°; calculated for $C_{16}H_{18}O_8N_4$: C, 48.7; H, 4.6; found: C, 49.0; H, 4.4). Cleavage of the ether group in this compound gave 2-methyl-3-(β-hydroxyethyl)-pyridine, the position of the substituents in which was shown by oxidation to quinolinic acid. The pyridine crystallizes with one water from chloroform-petroleum ether, and the water is not lost on distillation at 0.5 mm. pressure. The hydrate melted at 61–62° (calculated for $C_8H_{11}ON \cdot H_2O$: C, 61.9; H, 8.5; found: C, 62.2; H, 8.8). The picrate melted at 123–124° (calculated for $C_{14}H_{14}O_8N$: C, 45.9; H, 3.9; found: C, 46.3; H, 4.1). The above pyridine was condensed with 2-methyl-5-bromomethyl-6-aminopyrimidine hydrobromide to give 1-[(4-amino-2-methyl)-5-pyrimidylmethyl]-2-methyl-3-(β-hydroxyethyl)-pyridinium bromide hydrobromide, the true pyridine analog of thiamine, which charred at 240–260° dec. (calculated for $C_{14}H_{20}Br_2N_4O.H_2O$: C, 38.4; H, 5.1; found: C, 38.5; H, 4.6).

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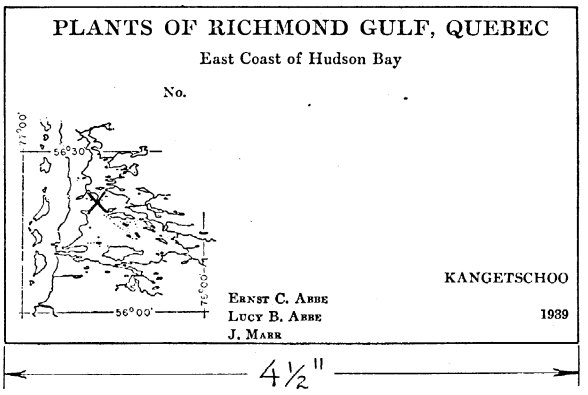
SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE USE OF OUTLINE MAPS ON HERBARIUM LABELS

THOSE who have had occasion to use herbarium specimens in distributional studies have experienced the aggravations attendant upon unsatisfactory definition of the localities listed on the labels. The problem affects not only ecological research and floristic plant geography, but also monographic taxonomy. In the experimental fields adjacent to taxonomy it is especially desirable to be able to return to the localities represented by herbarium specimens.

In regions which are well mapped, current practice often partially fulfils the above requirement through the indication of locality by township and range, by county or by latitude and longitude. Even greater precision would be desirable for some studies, such as in ecology and the genetical aspects of ecology and taxonomy.

For plants from regions which are poorly mapped or for which accurate maps are not generally available, such as that visited by the University of Minnesota Expedition to Hudson Bay,[1] there may be recommended the type of label illustrated in Fig. 1. The outstanding difference between this and the conventional labels is the inclusion of an outline map of the area, which results in a slightly larger than average size label (as indicated in the figure). There still remains generous space on the herbarium sheet for the plants and abundant space on the label for further data. The indication of the specific location at which the specimen was collected merely involves the insertion of a symbol (shown with an X in the figure) in the appropriate place on the outline map on the label. The added cost of this type of label is primarily accounted for by the cost of the zinc etching—in this case (at local prices) about $1.25. Thus the added cost per thousand labels is negligible.



The objection might be raised that a simple indication of latitude and longitude would be sufficient; but in poorly mapped regions an area may be very inadequately located with respect to the parallels of latitude and longitude. Furthermore, such regions are seldom shown in adequate detail even in the best atlases.

The locations of place names not given on standard maps and of places wholly lacking accepted names but to which temporary or local names have been given are clarified through the use of a map on the label. Such place names *may* be elucidated in diaries or in field note-books or in general accounts of collecting trips. Too frequently, however, these sources are not available to, or known by workers in the herbaria to

[6] Dornow, *Ber.*, 73: 353, 1940.
[7] Knoevenagel and Fries, *Ber.*, 31: 767, 1898.
[1] Abbe, SCIENCE, n. s., 90: 458, 1939.

which the specimens finally find their way. Frequently, too, such scattered and obscure sources of vital information become lost, and occasionally the place names used seem never to have existed except in the mind of the collector.

Since the method here described leads to precision in floristic studies and involves only slight additional cost in time and money over the conventional method of labeling, it should find ready use not only in the field of botany but in any field where precision in recording the source locality of natural objects is of importance.

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A SPATULATE PIPETTE SERVING AS SECTION LIFTER

DOUBTLESS one of the most distressing manipulations in the histo-pathological laboratory is the handling of frozen sections of tissue or of transferring celloidin sections from fluid to fluid. In the first case, a partial or total loss of a section is the rule rather than the exception. One reason for such high casualty is the want of suitable tissue carriers. The most commonly used carrier is a glass rod, but to this the tissue frequently adheres so completely that destruction of the section during the attempt to loosen it and spread it out is unavoidable. Some workers employ a spatula, a micro-slide or a brush, and though such appear to be preferable to the glass rod, considerable loss of sections is admitted.

A former associate, Dr. Baeslack (d. 1929), at the University of Würzburg, manipulated frozen sections with pipettes made from glass tubing of various sizes. In this way a section remains suspended in its liquid medium (water, alcohol, dye, etc.) while being transferred, and consequently the possibility of the loss of the section is reduced to a minimum, since it is not touched mechanically until it is placed on the slide. But a tube with a round lumen encourages the frequent twisting and folding of the section, making it difficult to flatten it. The writer overcame this disadvantage by making a flattened pipette, as illustrated in Fig. 1. The device is published here at the suggestion of Professor Kampmeier, who was impressed by its simplicity and effectiveness. Its usefulness as a section "lifter" or "carrier" has been demonstrated sufficiently well in our laboratory to bring it to the attention of other workers.

To make a spatulate pipette, one end of a thin-walled glass tubing with an inner diameter of about 7 mm (approx. ¼ inch) is heated in the flame to plasticity and placed between asbestos-covered jaws of a pair of pliers. To prevent cracking of the glass tube as the jaws are gently squeezed down on it, the asbestos must of course also be hot. With a little practice a uniformly flat chamber is made from suitable glass tubing, the size of the opening or slit being varied according to need; a slit 1 cm long and 2 mm in height

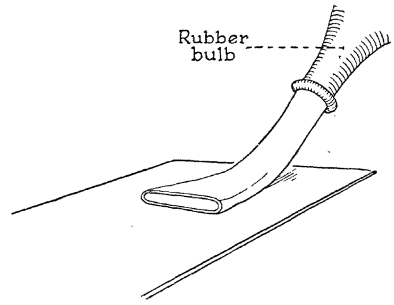

FIG. 1.

or width is generally adequate. The tube is then slightly bent, as shown in Fig. 1, to make it handier. A rubber bulb, as used on eye-droppers, is attached to the round end of the tube to complete the instrument. It is imperative that the pipette is always clean to prevent the sticking of the section to the glass as it is drawn into the lumen. For similar reasons any sharp edges at this end of the pipette must be rounded in the flame.

It is hardly necessary to add directions regarding the use of the spatulate pipette, so obvious are its advantages. When transferring a frozen section, for example, to a slide, it is allowed to be drawn into the slit of the pipette slowly and in a flattened condition with the fluid in which it is suspended. The middle of the slide is then flooded with a little additional fluid and the section expelled under gentle pressure so that it floats on the pool on the slide. The excess fluid is drained or sucked off with the pipette, letting the section settle flat on the slide. Should the section be crumpled or folded in part, fluid is rushed under that part which needs correction, meanwhile tilting the slide downward in the same direction; this maneuver prevents the section from separating from the slide.

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BOOKS RECEIVED

Annual Report of the Rockefeller Foundation, 1939. Pp. 507. Illustrated. The Foundation, New York.

BABOR, JOSEPH A. and ALEXANDER LEHRMAN. *General College Chemistry.* Pp. xiv + 659. 150 figures. $3.75. *Laboratory Manual for General College Chemistry.* Pp. 289. 46 figures. Crowell.

COMSTOCK, JOHN H. *An Introduction to Entomology.* Ninth edition. Pp. xix + 1064. 1228 figures. Comstock Publishing Company. $5.00.

HOLMAN, RICHARD M. and WILFRED W. ROBBINS. *Elements of Botany.* Third edition. Pp. xi + 392. 277 figures. Wiley. $2.75.

NECKERS, J. W., T. W. ABBOTT and K. A. VAN LENTE. *Experimental General Chemistry.* Pp. vi + 282. 22 figures. Crowell. $1.75.