

tation to the needs of man. "We are now," says Mr. Brooks, "applying science to the affairs of the nation as never before. The old-fashioned publicist with his classical education, or, at least, traditions, is being shouldered out of the way by the man who analyzes the problems of public welfare on scientific principles. . . . Yet there are not a few geologists, though I believe a constantly decreasing number, who seem to view with suspicion any attempt to make the science of geology more useful." We believe comment upon these statements would be altogether superfluous.

WM. H. HOBBS

UNIVERSITY OF MICHIGAN,

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#### PREPARATION OF WHOLE POLLEN MOTHER CELLS

TO THE EDITOR OF SCIENCE: The brief article by Albert Mann on the preparation of whole pollen mother cells for the examination of mitotic figures, in *SCIENCE* for August 2, suggested that others might be interested in some experiments made along the same line by the writer during the winter of 1911-12. The technical difficulties presented by the method worked out at that time are somewhat greater than in that suggested by Mann, but the results were, on the whole, quite satisfactory.

Whole anthers, which from previous examination were known to represent the stages wanted, were fixed for 30 hours in strong chrome-acetic acid. They were then carefully washed in running water for 24 to 30 hours and gradually run up to 80 per cent. alcohol, in which they were allowed to harden for several weeks. They were then stained for 3 to 5 days in a strong cochineal tincture or in Kleinenberg's hematoxylin. The stains were rinsed off with 80 per cent. alcohol. The specimens were further dehydrated, and after resting in absolute alcohol for 6 to 8 hours were put into a mixture of equal parts of absolute alcohol and cedar oil in an open vial or small cylinder. They were allowed to remain in the open vessel on the paraffin oven until the alcohol had completely evaporated, requiring 2 to 3 days. Finally specimens were carefully dissected or teased apart in a drop of

oil on a slide, and mounted by the addition of a drop of cedar-oil-balsam and a cover.

The important points are the hardening of cell walls before staining, the use of 70 per cent. alcoholic stains which do not overstain, and the gradual transfer from dehydrating to clearing and mounting medium, thus avoiding shrinkage of delicate cells. To any one acquainted with the two classes of stains the advantage of one which does not overstain to one which must be washed out for differentiation is well known, when dealing with mass staining. In trying out Mann's suggestions the writer found difficulty in preventing collapse of cells and in getting uniform results from the stains. The triple stain is especially difficult to manage in mass staining, and although a solution of Orange G. in clove oil, which gives the very best results with sections, was used, only a small portion of the material gave really satisfactory results.

Some of the stains used by the writer are new and the formulæ are given here for those who may care to try them.

*Cochineal Tincture, Ammonia-acetate.*—Digest 5 g. powdered cochineal with 150 c.c. 70 per cent. alcohol and 3 c.c. of glacial acetic acid at a temperature of 60-70° C. for 5 to 8 hours. Add ammonia until solution is neutral or but slightly acid and digest for 4 or 5 hours as before. Cool and filter until clear. Transfer to stain from 70 per cent. or 80 per cent. alcohol and rinse off excess with the same.

This solution does not overstain, and with material fixed in chrome-acetic acid stains chromatin lavender to violet and protoplasm a very light pink. In preparing fern prothallia for whole mounts the writer has found this to stain sperms and egg cells a violet tint with cell walls rose color.

For preliminary examination of pollen mother cells the old acetic-methyl green (5 per cent. to 10 per cent. glacial acetic acid added to a half saturated solution of methyl green in water) is the most generally useful, but it is of little value where gelatinous or slimy sap is present. For such cases the writer has found the following solution of

chloral hydrate and methyl violet of great value.

*Methyl Violet—Acetic-chloral Hydrate.*—To an almost saturated solution of chloral hydrate in distilled water add 10 per cent. volume of glacial acetic acid and enough dry methyl violet to make the liquid a bright violet color. This stains nuclei very quickly, and does not stain slimes so as to hinder observation.

The balsam used in mounting is oven-dried and then dissolved in pure cedar oil.

F. L. PICKETT

BOTANICAL LABORATORY,  
INDIANA UNIVERSITY,  
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PERSONAL REGISTRATION OF FAMILY MEMORANDA:  
A PLEA FOR THE MAKING AND PRESERVING  
OF HOMELY ANNALS

HUMAN efficiency is recognized to be the most desirable asset. Every one admits the expediency of attaining and perfecting individual capabilities.

Latent capabilities, inherent energies, are of use only when rendered available. To render them available and serviceable, are demanded full opportunities plus expert help in development and elaboration.

Conservation of inherent potentialities in all lines of natural resources has become an avowed principle in American industrial energizing. The first step in systematic procedures is to collect significant facts. Till data become numerous enough, sufficiently uniform and precise, no safe inferences and reliable conclusions can be formed. To achieve ultimate truth is only possible through intelligent, persistent and world-wide cooperation. Such methods for laying the foundations of practical certitude are being applied to most lines of endeavor and economic progress.

The one conspicuous exception is the study of human efficiency. Here methods are so lacking in system, so disproportionate, as to disappoint reasonable expectations.

Bureaus of animal industry are proceeding with excellent system and thoroughness.

Their methods already serve as models; their findings form the basis for important economies.

Especially defective are the means employed for preserving significant facts bearing on the life history, physical, psychologic, domestic and other factors of personal advancement in human beings.

This conclusion was reached while initiating a research the data for which were found unattainable. Conference with leading workers in economics, psychology, anthropology, clinical medicine and other promising sources of information confirmed a growing disappointment.

Here, then, we are halted at the threshold in a quest for fundamental facts essential to enlightenment. Deplorable neglect is discovered in the one department of research from which results of the gravest importance should evolve.

Wholly inadequate are the registrations of birth, marriage, death, and especially of the accompanying circumstances. Even such bare outlines of human history as are attempted by municipalities are admittedly partial, inexact, far from complete. The churches make some effort to preserve a few facts with little difference in result.

Carelessness in this particular is nearly as pronounced among the well-to-do and presumably intelligent as among the very poor and shiftless. Upon inquiry among the more liberally endowed, it will be found that few persons take the trouble to make and preserve any sort of systematic registration of incidents and circumstances of personal history. Experts in genealogy are put to all sorts of shifts to secure information.

Archaic as it seems, the family bible is still compelled to serve more or less inexpediently for the purpose; also legal instruments, such as wills, deeds, property transfers, personal and other epistles, and the like disconnected and accidental avenues of evidence.

The whole forms a pitiable, heterogeneous, but the only available source of information in what may prove to be a vitally important direction.