In the Laboratory

Mixtures of Solid Amino Acids for Microbiological Amino Acid Assay

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Microbiological procedures for the assay of amino acids in proteins, foods, and physiological fluids have been available for only about three years, yet they are employed routinely today in numerous laboratories. It is desirable, therefore, that the manipulations be made as simple as possible.

Techniques which have been employed advantageously in the authors' laboratory include the use of (a) a cover of heavy toweling for each rack of about 300 tubes in place of a cotton plug or metal cap for each test tube; (b) an automatic pipette instead of hand pipettes for the transfer of media, samples, distilled water, and cultures of microorganisms; and (c) solutions of mixtures of, rather than individual, amino acids. According to McMahan and Snell (*1*) and Stokes and Gunness (*4*), amino acid solutions are stable for several months when covered with a layer of toluene and stored in brown glass-stoppered bottles in the refrigerator. The present authors have observed that no change in concentration of amino acids in such solutions occurred in nine months. Lyophilized cultures of the lactobacilli *arabinosus* and *casei* have been utilized for the assay of vitamins by Nymon, *et al.* (*2*), and lyophilized basal media have been used for the same purpose by Spitzer, *et al.* (*3*). The latter have stated that lyophilized media for the assay of amino acids were in process of preparation.

It has been found that solid mixtures containing accurately weighed quantities of crystalline amino acids, which have been transformed to a homogeneous powder, may be employed conveniently in the preparation of basal media. Such mixtures may be prepared by placing the weighed amino acids in rubber-stoppered glass bottles and rotating the bottles in a ball mill. Quantities of powdered mixtures up to 40 grams have been prepared by rotating for 45 minutes a pint bottle containing the amino acids and six porcelain balls. The amino acid powders were not noticeably hygroscopic, and they have been found to be stable for at least six months when preserved in glass-stoppered bottles. Mixtures containing 15 to 18 amino acids have been employed successfully in the quantitative determination with *Leuconostoc mesenteroides* P-60 of arginine, cystine, histidine, isoleucine, leucine, lysine, and valine.

References

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3. SPITZER, E. H., BIDDISON, E. A., BERGERON, C., and CALDWELL, J. E. *Science*, 1944, **100**, 555.
4. STOKES, J. L., and GUNNESS, M. *J. biol. Chem.*, 1945, **157**, 651.

Demonstration of the Bronchial Tree and Pulmonary Blood Vessels in the Fetal Pig

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By a very simple and easy procedure the bronchial tree and pulmonary blood vessels of the fetal pig may be freed from other lung tissue and revealed with surprising clarity and completeness of detail. The method is so simple it has been incorporated into the routine laboratory study of the fetal pig in our classes in elementary biology.

The pigs used are embalmed, uninjected specimens around 8 to 11 inches in length, obtained from a supply house. The lungs are removed from the body, with trachea attached, and then by the simple expedient of crushing and squeezing them in the hand and rubbing them gently between the fingers, with an occasional rinse in water, the parenchyma of the lung is gradually broken up and washed away, leaving intact all but the minute subdivisions of the bronchial and vascular systems. This process should not be hurried, and 30 minutes or more may be required to clear away the parenchyma. In breaking up, the lung tissue separates mainly along the boundaries of the secondary lobules, and the latter, or their fragments, then break away from their bronchial and vascular connections. The ultimate portions of the latter systems are carried away in the lung fragments. When virtually all of the lung tissue has been cleared away from the vessels, the preparation is floated in water and denuded of the last bits of parenchyma, strips of pleura, etc., with forceps.

When floated in water, the air and blood vessels tend to resume their natural positions, and one is able to observe their ramifications and distribution in a striking and vivid manner. The terminal twigs of the systems range almost to the limit of naked eye visibility.

One may now separate arteries, veins, and bronchial tree so that each may be viewed in isolation. In the laboratory, this step is usually done for the students simply by stripping blood vessels off the bronchial tree rapidly with forceps. This may result in a good deal of breakage of blood vessels, but the very apparent differences between arteries and veins may be pointed out. With careful and patient use of needles and forceps, however, it is possible to isolate the complete system of pulmonary arteries, and of pulmonary veins, each separate and intact. To accomplish this it is necessary, of course, to use a preparation in which the pulmonary artery has been severed close to the heart, and in which the proximal connections of the veins have been preserved by removing with them a part of the wall of the left auricle. The isolated arterial and venous systems, as well as the bronchial system, make striking demonstration specimens and may be mounted in formalin in museum jars for permanent display.

This method has obvious advantages over that of corrosion preparations, particularly in that, instead of casts, the various vessels themselves, with their noticeable differences in characteristics, are demonstrated. A more complete account of methods, with photographs of preparations, will be published elsewhere. The applicability of the method to the human lung is under investigation.

News and Notes

Editorial Announcement

In January of this year it appeared that conversion from a wartime basis was pretty well under way and that the year 1946 would see a return to fairly normal peacetime supplies of all kinds, including paper. We consequently made our plans to publish 48 pages in each issue of *Science* and also planned at least four special issues during the year, each one of which would consist of at least a hundred pages.

Time made it clear that paper supplies would not be available to consummate this plan, and as a consequence, we were forced to reduce the size of an issue to 32 pages on 24 May. With only minor modification we have remained at this level until the present issue, which contains an index for Volume 103. With the 12 July and succeeding issues, we shall have to drop back to the thirty-two page level again.

The reduction in size is shared equally between the advertising pages and the editorial content, and in order to conserve our regular book paper for the editorial section and the index, we used color stock for some of the advertising pages.

The first six months of 1946 saw the sudden declassification of a considerable amount of wartime research, resulting in a flood of manuscripts which we would not have been able to accommodate even though we were not faced with a paper shortage. Today the situation is so critical that manuscripts which were accepted in the faith that publication would normally take place within a reasonable time have had to be deferred beyond the expectation of the authors and editor.

During this critical period it is absolutely essential that authors use every means of making their papers as brief as possible. In some cases we have been forced to return papers that were already accepted for even further shortening.

The editor contemplates with distaste the unpleasant task of having to reject many worthy papers in the next six months due to previous commitments and inadequate paper supplies.

Science stands ready to relinquish all priority to papers now waiting in our files for publication if the author can find a suitable medium for prompter publication.

Announcements

Important changes in organization of the National Research Council were announced by Frank B. Jewett, president of the National Academy of Sciences, 28 June. Effective from 1 July, 1946, the following appointments have been made of administrative officers in the National Research Council:

Chairman of the Council: Detlev W. Bronk, director, Johnson Foundation for Medical Physics, University of Pennsylvania, to succeed Ross G. Harrison, Yale University—term expired.

Chairman, Division of Medical Sciences: Lewis H. Weed, director, School of Medicine, Johns Hopkins University, on a full-time basis, to succeed himself.

Chairman, Division of Physical Sciences: R. Clifton Gibbs, Department of Physics, Cornell University, to succeeed L. P. Eisenhart, Princeton University—term expired.

Chairman, Division of Chemistry and Chemical Technology: Louis P. Hammett, Department of Chemistry, Columbia University, to succeed W. Mansfield Clark, Johns Hopkins University—resigned.