Closed Technique for Collection and Storage of Aliquots of Blood[1]

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To follow the aging process of the erythrocytes in various "preservatives," serial tests must be done and compared. A system for aliquoting and storing samples has been devised which is superior to present methods. The storage container is fabricated from a nonreactive, temperature-resistant plastic of polyvinyl chloride. It consists of a suitable length of 2-cm, lay-flat tubing, which is partitioned by sealing barriers transversely every 3 cm. The partitions have an opening about 1 cm in diameter along one side of the tube and serve to divide the container into 10 small compartments of about 5 cc each. In addition, a 50-cc compartment is formed at one end in which the blood is first mixed with the diluent. A three-way stopcock, treated to render its surface hemorepellent (*1*), is inserted into the collecting tube. This permits control of the stream of blood and the attachment of a syringe. In preparation, the entire unit (Fig. 1) is sterilized by exposure to saturated steam at 121° C for 30 min.

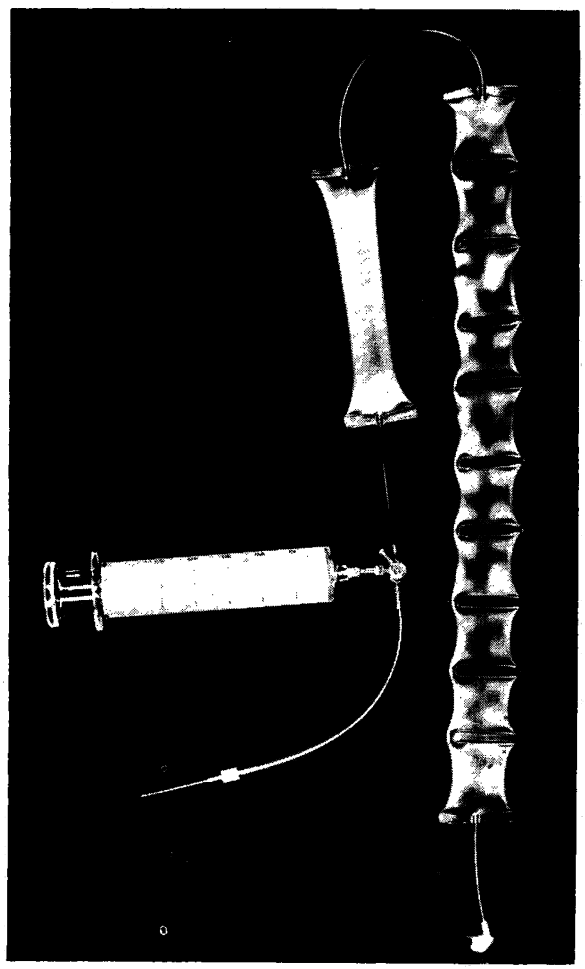

FIG. 1. Unit for collection and storage of aliquots of blood.

Blood is collected by gravity under sterile conditions in the large chamber, where a thorough mixing of blood and diluent from the syringe is accomplished. It is then permitted to enter the smaller compartments, where it is equally and automatically divided among them. The small passage in the partitions between chambers is sealed hermetically by dielectric heat. The chain of compartments may now be stored under identical environmental conditions. An aliquot can be removed periodically by dividing the sealed barrier with scissors to free a single compartment, leaving the remaining ones sterile and undisturbed.

[1] This work was done under a contract (DDRD-3) with the Department of the Army.

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Reference

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Manuscript received October 1, 1951.

Some New Coordination Compounds of Thallium

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In 1909 the German chemist J. Gewecke became interested in the extensive agreement in the behavior between trivalent thallium and gold. This behavior became more apparent in some of the double chlorides of these two metals. He prepared a number of these double salts using the chlorides of divalent metals by allowing a solution of the component salts in water acidified with HCl to evaporate in a vacuum over concentrated sulfuric acid. These salts all corresponded to the formula $2TlCl_3 \cdot MCl_2 \cdot x\ H_2O$, where "*x*" was usually equal to 6 or 8. The similarity of the double salts of thallium and gold can be seen from Table 1 (*1*):

TABLE 1

$2TlCl_3 \cdot NiCl_2 \cdot 8H_2O$	$2AuCl_3 \cdot NiCl_2 \cdot 8H_2O$
$2TlCl_3 \cdot CoCl_2 \cdot 8H_2O$	$2AuCl_3 \cdot CoCl_2 \cdot 8H_2O$
$2TlCl_3 \cdot CaCl_2 \cdot 6H_2O$	$2AuCl_3 \cdot CaCl_2 \cdot 6H_2O$
$2TlCl_3 \cdot SrCl_2 \cdot 6H_2O$	$2AuCl_3 \cdot SrCl_2 \cdot 6H_2O$
$2TlCl_3 \cdot MgCl_2 \cdot 6H_2O$	$2AuCl_3 \cdot MgCl_2 \cdot 6H_2O$
$2TlCl_3 \cdot ZnCl_2 \cdot 6H_2O$	$2AuCl_3 \cdot ZnCl_2 \cdot 8H_2O$
$2TlCl_3 \cdot CuCl_2 \cdot 6H_2O$	

Notably missing from Gewecke's list are the double chlorides of barium chloride and mercuric chloride. There seemed to be no apparent reason for their nonexistence, and so their preparation was instituted in a method similar to that outlined by Gewecke for the previously prepared salts. A typical preparation

was as follows: To an acidic solution of 15 ml of water were added 0.006437 moles (4.0000 g) of thallic chloride and 0.01288 moles (3.4970 g) of mercuric chloride. The solution was stirred and then subjected to vacuum desiccation over concentrated sulfuric acid for a period of 24 hr.

In this preparation, as in all the others, the ratio of 2 moles of thallic chloride to 1 mole of the metallic chloride was utilized in deciding what weights to use.

The results were successful, yielding the two corresponding double salts. Both were very hygroscopic and as a result were kept in a vacuum desiccator or in an airtight container. The octochlorodithallate of barium was white in color and formed monoclinic crystals. Its formula is $2TlCl_3 \cdot BaCl_2 \cdot 6H_2O$. Monoclinic crystals were also very noticeable in the white double salt of divalent mercury. Its formula was proved to be $2TlCl_3 \cdot HgCl_2 \cdot 12H_2O$.

Although these new double salts of thallium may not have any immediate value, it is hoped that they will eventually serve to disclose more of the chemistry of the "duckbill" of the elements.

Reference

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Manuscript received October 29, 1951.

Effects of High-Voltage Cathode-Ray Irradiation on Cottonseed

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High voltage x-rays and cathode rays have been shown to destroy pure cultures of molds and bacteria at minimum dosages of 1,000,000 and 1,500,000 roentgen-equivalents-physical (rep), respectively (*1*). This information suggested a practical application of ionizing radiations in the sterilization of foods and possibly seeds. Ground beef (*2*), fish slices (*3*), and other foods (*4*) have been irradiated, with the desired results. The reports on these foods indicated, however, that at dosages necessary for sterilization, enzymes in foods are slightly affected.

The effects of ionizing radiations have been recorded for many species of seeds. When applied to wheat (*5*), tomato (*6*), and mung beans (*7*) excessive irradiation has resulted in injury manifested as reduced and delayed germination, inhibition of growth, and, in some instances, complete loss of viability. Similar unfavorable reactions were observed when cottonseed was first irradiated with x-rays in 1933 (*8*). Since then, the sterilizing effects of combined ultraviolet and infrared rays have been noted (*9*).

This paper describes the adverse effect of high-voltage cathode rays on germination and growth of cottonseed when these rays are applied in dosages of sufficient strength to destroy associated microorganisms. Cathode rays were produced by a pressure-insulated, electrostatic generator of the Van de Graaff type, operating at 3 mev and capable of emitting a continuous supply of monoenergetic electrons in a magnetically focused beam (*10*). The dosages of cathode rays are expressed in terms of rep as described by Evans (*11*).

Two varieties of cottonseed were used in these investigations: a Stoneville 2B variety, crop year 1949, of 16.7% moisture and 2.24% free fatty acids contents; and a Delfos 651 variety, crop year 1948, of 11% moisture and 0.4% free fatty acids contents. The lot of Stoneville 2B seed was subdivided into 7 samples which were heat-sealed in polyethylene tubing. One sample was set aside as the control, and the remaining 6 received dosages of high-voltage cathode rays ranging from 500,000 to 3,000,000 rep in increments of 500,000 rep. The Delfos 651 variety was subdivided into 9 samples. One unirradiated sample was used as the control. The 4 remaining pairs of samples were irradiated at increasing dosages of cathode rays as follows: 500,000; 1,000,000; 1,500,000; and 2,000,000 rep, respectively. All treated lots of seed were irradiated in a single layer—the thickness necessary for effective exposure with a single dose. Irradiation was conducted from one side only.

The effects of ionizing radiations on cottonseed were measured in terms of moisture and free fatty acids contents, total and internal microbial populations, germinability, and growth. Methods used for the determinations of moisture and free fatty acids contents were those recommended by the American Oil Chemists' Society (*12*). The numbers of microorganisms per gram of whole seed were determined as published previously (*13*), except that the plating medium used for the growth of bacteria was tryptone glucose extract agar. Except where otherwise indicated, internal microflora were observed by planting 200 acid-delinted surface-sterilized (0.1% $AgNO_3$) seeds from each sample on a modified Czapek's medium and recording the percentages of seeds showing visible evidence of the growth of microorganisms. In addition, the numbers of seeds germinating on the agar were noted. Separate germination tests were made according to the standard method (*14*); counts were taken on the sixth and ninth days, no additional sprouts being observed after the sixth day. Growth measurements of the sprouts were recorded as their lengths in millimeters at 9 days.

When applied to the Stoneville 2B variety of cottonseed, high-voltage cathode rays at 1,500,000 rep inactivated the microflora in the seeds (Table 1). Ex-

[1] Assistance in some of the analyses is gratefully acknowledged to E. A. Jensen, NCPA fellow, Mrs. J. S. Lambour, of the Protein & Carbohydrate Division, and to the Analytical & Physical Division, SRRL, New Orleans, La. Appreciation is expressed to James B. Dick, Delta Branch Experiment Station, Stoneville, Miss., for furnishing the seed used in these investigations.

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