the A and B factors are most important in accounting for the dermal reactions. This belief is based on the fact that individuals who show skin sensitivity to A or B plasma are also sensitive to AB plasma. Also individuals sensitive to A or B plasma are sensitive to Witebsky's purified A and B substance.[5]

The correlation between the skin tests and the transfusion reactions is suggestive, but further work is necessary before any conclusion can be reached as to the cause of the reactions. It is not known what pooling of plasmas will do toward the elimination of transfusion reactions. Pooling of plasmas from bloods of incompatible groups failed to neutralize the skin reacting substance. For example, an individual of group O, sensitive to A plasma, still gave a positive skin test after the A plasma had been mixed with an equal volume of B plasma.

From our results it is obvious that plasma reactions do occur, and that there is a correlation between skin sensitivity to the plasma and reactions after plasma transfusions. Negative skin tests preclude the possibility of reactions to intravenous administration of the plasma. Therefore, to prevent reactions, skin tests should be used wherever possible prior to a transfusion.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

ELIMINATION OF CONTAMINANTS WITH ULTRA-VIOLET RADIATION

SMITH[1] has described an air filtration apparatus with which it is possible to reduce considerably the population of spores of fungi and of bacteria present in the laboratory atmosphere. The purpose of reducing the atmospheric spore load is to enable the preparation and transfer of cultures without losses from contamination. A means of establishing atmospheric sterility is particularly desirable when the conditions are such that an excessive amount of contamination still occurs after every precautionary measure has been employed.

An inexpensive, ultra-violet generator[2] has been devised which is intended for use under laboratory and industrial conditions where the strictest sanitation is desired. A brief study on the practical effectiveness of the generator in reducing air-borne contaminants has indicated that it is superior to the air filtration apparatus described by Smith.

The tests were carried out in a small room in which two 30″ ultra-violet generators are mounted on the ceiling equidistant from the ends of the room. The room is used almost daily as an inoculation chamber for the manufacture of grain spawn. Grain spawn is made by inoculating a sterile rye grain medium in a milk bottle with the mycelium of the cultivated mushroom, *Agaricus campestris*. Mold spores or bacteria which invade the bottle at the time of inoculation grow luxuriantly on the rye grain medium and render the bottle worthless as spawn. In commercial practice a large number of bottles are inoculated at one time. The number of bottles which become contaminated is dependent on the density of the spore population in the atmosphere of the chamber. The air filtration apparatus mentioned above is also mounted for permanent use in the chamber so that an opportunity has been afforded to directly compare the effectiveness of air filtration with ultra-violet radiation in reducing contamination.

In a preliminary test the chamber was contaminated as much as possible by blowing in air from an adjoining unclean room. The door was then closed and ten sterile petri dishes containing potato-dextrose agar were placed on small tables in various parts of the room. These were then exposed to the atmosphere for three minutes each. During the exposure the air in the chamber was kept in constant motion by turning on the air filtration apparatus after closing the air outlet vent. The chamber was again contaminated and the ultra-violet generators turned on. At the end of each hour, for the next five hours, ten petri dishes were exposed in the same manner as the first ten. All the dishes were then incubated for five days. The number of contaminants in each dish was recorded. No distinction was made between a bacterial and a fungus colony. The results are shown in Table 1.

For all practical purposes the atmosphere of the chamber was rendered sterile after 4 hours of radiation.

In another preliminary test 3 common molds which frequently contaminated the bottles were isolated and their lethal dosages determined. A spore suspension was made of an unidentified Penicillium species, an unidentified Alternaria and *Monilia sitophila*. The suspensions were then sprayed over the surface of glass slides covered with a film of agar. The slides were then exposed to the radiation at a distance of 5′ from the source. All the Penicillium spores were

[5] Supplied by Eli Lilly and Company.

[1] N. R. Smith, SCIENCE, 75: 199–200, 1932.

[2] Westinghouse Sterilamp. The radiation is produced by a discharge through a mixture of inert gases in a tube containing mercury vapor at low pressure.

TABLE 1

STERILIZATION OF THE ATMOSPHERE WITH ULTRA-VIOLET RADIATION

Hours of radiation	Average number of contaminants in 10 dishes exposed for 3 minutes
None	15.1
1	11.6
2	9.7
3	1.3
4	.1
5	.1

killed in two hours at this distance. The Alternaria and Monilia spores were killed after 1.5 hours of radiation. In order to secure consistent results it is necessary to agitate the suspensions violently before spraying, since the spores frequently tend to stick together in clumps and screen each other from the radiation.

The lethal dosages of three common spore-forming bacteria were determined in the same manner. *Bacillus subtilis* and *B. mycoides* were killed in 25 minutes. *B. mesentericus* was killed after 45 minutes of radiation.

The effectiveness of the ultra-violet generators was practically illustrated by using them in the commercial manufacture of grain spawn. In the spawn plant where the tests were carried out,[3] 180 bottles are sterilized and inoculated at one time. The sterilizer is inside the chamber. The records showed that the average loss from contamination over a period of time was about 11 per cent. or 20 bottles per set when no attempt was made to sterilize the chamber. The average loss was cut down to about 6 per cent. or 11 bottles per set when the air filtration apparatus was used. In this method, filtered air was admitted into the chamber for a period of two hours before the inoculation and was allowed to remain on during the inoculation. The loss was cut down to about 1 bottle per set with a modification of the air filtration technique. The modification consisted of fumigating the room with formaldehyde and then blowing out the fumes with filtered air. It was not considered possible to reduce the loss below this figure under commercial conditions. When the ultra-violet generators were used, the chamber was radiated for four hours previous to the inoculation. The average loss in ten sets was about 1 bottle per set.

The radiation method of reducing contamination is more desirable since it is simpler and less drastic than the formaldehyde-air filtration technique.

In laboratories, and especially in industrial operations, where contamination is a constant problem the installment of a chamber equipped with ultra-violet generators would be a practical solution. It is advisable, although probably not necessary, to have the autoclave right in the chamber to avoid carrying sterile material through a contaminated atmosphere.

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SOLUBILITY OF ANTERIOR PITUITARY GONADOTROPIN IN ALKALI HALIDE SOLUTIONS[1]

IN a study of the extraction and purification of the gonadotropic factor of the anterior lobe of the pituitary gland, it was found that aqueous solutions of the alkali halides are good solvents for this hormone.

Acetone-dried sow pituitary powder was extracted with 20 and 10 parts of the salt solutions. The powder was shaken with the salt solution in a mechanical shaker four hours, then centrifuged at 3,500 rpm for twenty minutes at room temperature. Aliquot portions of the supernatant fluid were then dialyzed against distilled water for 14 hours in a refrigerator.

Values given in Table I (calculated back to the original extract) show the R. O. U. (rabbit ovulation unit) per cc of solvent as compared with distilled water extract.

TABLE 1

Solvent	Rabbit Ovulation Unit/cc	
	10 : 1 solution	20 : 1 solution
Distilled water	70	40
25 per cent. satn. NaCl	80	..
50 " " " "	90	45
64 " " " "	70	..
10 " " " LiCl	65	..
25 " " " "	180	95
50 " " " "	< 40	..
50 " " " KCl	60	..
50 " " " NH_4Cl	170	> 100

Studies in progress using acetone-dried sheep and horse pituitary powder indicate comparable results.

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[1] From the Department of Obstetrics and Gynecology, University of Rochester Medical School and Strong Memorial Hospital.

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