(3) If, after testing, the glass is washed in the container with distilled water and then tested again, no significant amount of oxygen is absorbed. Drying at 140° C. or at 30° C. reactivates the glass. The material is also reactivated when spread out in an oven at 140° C. in an atmosphere of nitrogen or oxygen. If the material is dried closely packed together, little activation takes place.

Material was treated in following orders :

Pyrex' glass (108 gm.)	Oxygen absorbed (p.p.m.)	Silica (100 gm.)	Oxygen absorbed (p.p.m.)
Cleaned and dried	0·60	Cleaned, not dried	0·05
Washed and tested again	0·00	Washed, dried in oven, spread out	0·63
Distilled water added, boiled, cooled, and tested	0·09	Dried in atmosphere of O_2, spread out	0·87
Washed and dried in oven, spread out	0·64	Dried in atmosphere of N_2, spread out	1·29
		Washed, not dried	0·06
		Dried, packed in bottle	0·10

(4) Distilled water which has remained in contact with activated glass for 20 minutes or longer is able to reduce potassium permanganate in the absence of the glass. The water from contact with silica or 'Pyrex' was less active than that from bottle or plate glass, but the differences are of doubtful significance in view of the fact that in some cases small fragments of the material remained in the distilled water after decantation.

Type of oven-dried glass in contact (100 gm.)	Distilled water	'Pyrex'	Silica	Plate	Bottle
Oxygen absorbed (p.p.m.)	—	0·24	0·23	0·57	0·77
Relative conductivity (mho × 10^{-6})	2·49	2·54	2·49	3·13	2·90

Control experiments have shown that the initial method of cleaning the glass is not responsible for the reduction of the potassium permanganate, nor is the effect due to adsorption of the liberated iodine on the glass at the titration stage of the test. No explanation of the phenomena observed is offered ; it is hoped that some elucidation may be forthcoming from more appropriate quarters. In view of the fact that both silica and 'Pyrex' are effective in reducing permanganate, the effect is not entirely due to the presence of free alkalinity from the material ; this point is confirmed by the conductivity measurements. The most striking observation recorded appears to be that glass or silica may be activated whether the atmosphere is of oxygen, nitrogen or free air, but that it is essential for the particles to be well spread out.

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Adsorption of Water Vapour in High-Vacuum Apparatus

THE measurement of water-vapour pressures in a glass high-vacuum apparatus is susceptible to considerable errors through adsorption, particularly at high water-vapour pressures and low temperatures. This adsorption can be nearly eliminated by the use of a hydrophobic surface, and a simple method of coating the apparatus has been suggested to us by Dr. A. E. Alexander. We find that if the glass surface is treated with a 0·05 per cent solution of 'Cetavlon', $C_{16}H_{33}N^{+}Me_3Br^{-}$, in water, a monolayer is adsorbed giving an external surface equivalent to a hydrocarbon ; excess reagent is removed by washing with water. The adsorbed layer is not affected by high vacua, and allows quantitative measurement of pressures of water vapour to be made accurately in accordance with Boyle's law.

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General Equation for the Serial Dilution Technique in Microbiological Assays

THE basis of the serial dilution technique is a comparison of a solution of the sample of material under test with a solution of a standard sample of known strength. In order to make the comparison, serial dilutions of both the standard and test solutions must be made ; in cases where the potency (or purity) is roughly known to start with, the number of such dilutions necessary is usually four or five. When, however, there is not even a rough indication of the probable potency of the sample being assayed, a wide range of dilutions is involved, some of which will probably be outside the scope of the tables that may be available for the evaluation of potencies in routine work. It seems desirable, therefore, to have at hand a general expression for evaluating the results of a serial dilution procedure ; such an expression, apart from its intrinsic interest, will be useful for application in the cases of certain routine samples as well as of investigational work where unpredictable losses of potency may occur.

In deriving the equation, the following serial dilution technique is assumed. A solution of known strength is prepared from the standard sample and diluted to a suitable strength by one or more dilutions. A known weight of the sample under test is dissolved in a known volume of solvent and diluted similarly. Further dilutions of the standard and test solutions are carried out in nutrient broth, the first broth dilution normally (but not necessarily) being the penultimate dilution.

The ultimate dilutions of both standard and test solutions are obtained by adding successively decreasing volumes of the penultimate dilution to a series of tubes each containing the same volume of broth ; they consist, therefore, not of one dilution but of a *graded series* of dilutions. (Sometimes a graded series of broth volumes is recommended so that all dilutions have the same volume. Such procedure has the advantage that the results can be written down at sight from the experimental readings, but it is attended by the drawback of an overall loss of time due to the manipulative work involved.) After inoculation and incubation, a member of the graded series of the test dilutions and a member of the graded series of dilutions of the standard which match one another in respect of a particular property are ascertained. These two selected dilutions are regarded as being equal in strength in relation to the substance being assayed, whence the potency of the original sample is calculated.