SCIENCE

VOL. 96 FRIDAY, JULY 17, 1942 NO. 2481

SCIENCE: A Weekly Journal devoted to the Advancement of Science, edited by J. MCKEEN CATTELL and published every Friday by

THE SCIENCE PRESS

Lancaster, Pennsylvania

Annual Subscription, $6.00 Single Copies, 15 Cts.

SCIENCE is the official organ of the American Association for the Advancement of Science. Information regarding membership in the Association may be secured from the office of the permanent secretary in the Smithsonian Institution Building, Washington, D. C.

COLLECTIVE FARMING IN RUSSIA AND THE UKRAINE[1]

By Sir JOHN RUSSELL, F.R.S.

DIRECTOR OF ROTHAMSTED EXPERIMENTAL STATION

AT the outset I must remind you of a few geographical facts in regard to European Russia. It is a vast rolling plain, with no mountains except at its edges, but it has a backbone of higher land in the center so that most of the rivers rise here and wind slowly north, south or east to the sea. Moscow at the center owes its rise and development to the fact that it is near to all of them. The rainfall (including the snow) is highest in the west central part and falls off as you go to the southeast, but it is nowhere high by English standards: not more than 25 inches. In the wetter part there is much forest; coniferous trees and birch in the north, more deciduous trees in the center and to the south, but with much marsh. To the southeast, where the rain suffices for grass but not for trees, there is the black earth and the steppe, and still further eastwards the steppe becomes more arid in character. The forest and the steppe have given a distinctive character to Russian life, just as its rivers have played a great part in shaping its history. It is impossible to convey any adequate impression of the vast size and almost endless solitude of Russia: even in 1935 only about 6 per cent. of the land of European and Asiatic Russia was in cultivation; the rest was mostly wild.

From early times the Russians adopted a system of agriculture very much like the old three-field system, with its scattered strips common in northern Europe. Alongside a feudal system very different from ours were the peasant Communes who held in common the land alloted to them, periodically redividing it among themselves. The peasants' share grew steadily, and

[1] Afternoon lecture, Royal Institution of Great Britain, December 18, 1941.

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.

ALBERT M. KLIGMAN
UNIVERSITY OF PENNSYLVANIA

[3] J. B. Swayne, Kennett Square, Pa.

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.

D. O. ROSBASH
C. A. ELDEN
M-D. FELLOWS NUTTING

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

BOOKS RECEIVED

HENNEY, KEITH. *Principles of Radio.* Fourth edition. Illustrated. Pp. xii + 549. John Wiley and Sons, Inc. $3.50.

KALICHEVSKY, VLADIMIR A., and BERT ALLEN STAGNER. *Chemical Refining of Petroleum.* Revised edition. Illustrated. Pp. xi + 550. Reinhold Publishing Corp. $7.50.

KOKOMOOR, FRANKLIN WESLEY. *Mathematics in Human Affairs.* Pp. xi + 754. Prentice-Hall, Inc. $5.35.

Memoirs of the National Academy of Sciences. Vol. XXIII. Pp. xvi + 108. U. S. Government Printing Office, Washington, D. C.

SCHOENHEIMER, RUDOLF. *The Dynamic State of Body Constituents.* Pp. x + 78. Harvard University Press. $1.75.

SMITH, LAWRENCE W., and EDWIN S. GAULT. *Essentials of Pathology.* Illustrated. 13 Plates. Pp. xviii + 904. D. Appleton-Century Co. $10.00.