the slightest evidence that the academy ever did such a thing as Ball claims.

On the contrary, the academy bestowed upon Gauss at an early age the highest academic honors.

The record of the French Academy is clear and all in favor of Gauss.

ARNOLD EMCH

LEEUWENHOEK LETTERS

SOME American libraries and collections may possess letters written by and to Antony van Leeuwenhoek; and photographic copies of such letters are being sought by the Royal Academy of Sciences of Amsterdam, which is preparing a critical edition of Leeuwenhoek's correspondence. A list covering about 100 missing items is published in the appeal of Dr. G. van Rijnberk in *Nederl. Tijdsch. v. Geneeskunde,* December 1, 1934.

Readers knowing of such letters in America are asked to communicate the information to Dr. van Rijnberk, or to the undersigned.

BARNETT COHEN
JOHNS HOPKINS MEDICAL SCHOOL

SCIENTIFIC APPARATUS AND LABORATORY METHODS

AN EXTRACTOR USING A SOLUTION OF VOLATILE AND NON-VOLATILE PHASES

UNLIKE most extractors which are limited in their use to volatile solvents, a simple device is suggested which extracts with a solution consisting of one volatile phase and one or more non-volatile phases. Its success is due to the fact that if the vapor-disengagement area is sufficiently reduced, entrained solution is carried with the vapor.

A flask (Fig. 1) is filled with solution to a single small outlet. When boiled, vapor and solution are carried up to the filter. A baffle separates the vapor from the liquid. The return of the liquid through the filter to the bottom of the flask is facilitated by convection currents caused by heating the flask on one side.

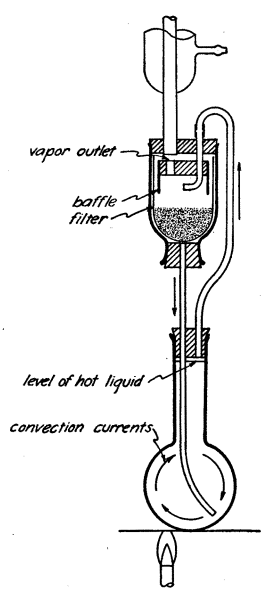

FIG. 1

The process is continuous and the velocity is controlled entirely by the amount of heat supplied. Larger quantities of liquid may be delivered to the filter than by condensate devices, since only a small part of the liquid has to be vaporized. This device may also extract by condensate alone by simply lowering the level of the liquid in the flask, thus increasing the disengagement area.

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A SIMPLE METHOD FOR OBSERVATION OF CIRCULATION IN THE WEB OF THE FROG'S FOOT

CIRCULATION of blood in the web of the frog's foot may be observed very clearly if the spread foot is strapped over the hole in the frog board with a strip of wet Cellophane secured to the board by thumb tacks (Fig. 1). The preparation is more quickly made than

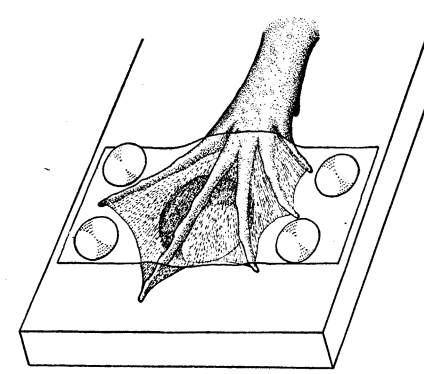

FIG. 1

are preparations in which the foot is spread by tying the toes, and is superior in a number of other respects. Since the animal is relatively comfortable, movements of the foot are reduced to a minimum. The web may be kept moist by occasional moistening of the Cellophane, or by introducing a film of water between the web and the Cellophane. Since the web is relatively flat, a good picture may be obtained with the 4 as well as with the 16 millimeter objective, without the use of

a cover glass. Preparations made thus may be kept under observation for a long time with little attention, except occasional moistening. With animals wrapped in the usual manner in wet cloth, preparations have been used in our laboratory for periods exceeding two hours. The method is so simple and obvious, the writer suspects that others must also have thought of it; but he makes bold to pass it on to those who may not have done so.

HORACE J. CHILD

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THE DESIRABILITY OF HOMOZYGOUS MICE IN NUTRITION EXPERIMENTS

IT is pretty generally conceded that the Wistar strain of rats is preferable in nutrition experiments, so that the animals will be homozygous and also of the same strain in coordinating the work of different investigators. Mice are used mainly by bacteriologists, cancer workers and geneticists, but in the assay of hormones and the determination of the nutritive value of pure chemical substances it is sometimes possible to save thousands of dollars by using mice instead of rats. Yet no standard strain of mice has been generally adopted. Since, however, a number of papers have appeared, using the Bagg strain of homozygous albino mice (Cold Spring Harbor Station of the Carnegie Institution), it seems probable that Table 1, showing the growth rate (mean body weight and standard deviation) of Bagg albinos, quoted from our paper in "Science Reports of Tohoku Imperial University," April, 1935, should be of interest. A paper on the growth and chemical composition of the brain of Bagg albinos by Hideo Endo will also appear in the same reports at a later date. Although the mouse grows at a slower rate we have been able to produce marked rickets in the mouse on the same diet that produced rickets in the rat.

TABLE 1

BODY WEIGHTS AND STANDARD DEVIATIONS IN GRAMS

Day of age	Males		Females	
	Mean weight	S.D.	Mean weight	S.D.
1	1.313	.200	1.300	.200
2	1.506	.245	1.515	.200
3	1.754	.283	1.770	.316
4	2.090	.374	2.160	.316
5	2.452	.458	2.570	.436
6	2.880	.548	3.020	.557
7	3.300	.574	3.470	.781
8	3.770	.663	3.970	.761
9	4.205	.768	4.425	.894
10	4.670	.774	4.920	.974
11	5.020	.948	5.320	1.118
12	5.390	1.128	5.630	1.288
13	5.775	1.162	6.040	1.331
14	6.100	1.162	6.410	1.414
15	6.407	1.200	6.690	1.536
16	6.570	1.049	6.920	1.477
17	6.780	1.183	7.040	1.550
18	6.850	1.483	7.170	1.517
19	6.960	1.442	7.240	1.637
20	7.130	1.466	7.410	1.674
21	7.330	1.449	7.720	1.612
22	7.669	1.634	7.950	1.761
29	9.480	1.803	9.870	1.897
36	12.360	2.345	12.500	2.290
43	14.740	2.236	14.470	2.190
50	16.740	2.510	15.610	2.388
57	18.540	2.934	16.640	2.367

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SPECIAL ARTICLES

COMPARISON OF X-RAY AND GAMMA RAY DOSAGE[1]

NEED for a suitable correlation between x-ray and radium dosage had led us to extend our recent studies in the ionization produced in liquids by x-rays.[2] This note is for the purpose of giving briefly the results of some absolute measurements of the ionization produced in carbon bisulfide by gamma rays. Air ionization methods, while satisfactory for dosage measurements up to 200 kv, may be rendered ambiguous for higher frequency radiations because of lack of radiation equilibrium. A comparison of the physiological effects of different radiations ideally should be based on comparison of the numbers of ions produced in the tissue. In practice, one can make relative measurements in dielectric liquids nearly equivalent in density and atomic number to living tissue.

For gamma rays carbon disulfide is sufficiently near tissue (or wax) in atomic number and density to be considered equivalent. A combination of the two materials will, therefore, give an effectively homogeneous medium in which there will be radiation equilibrium and uniform mass absorption. Measurements were made of the gamma ray absorption in a layer 1 mm thick at the incident surface of a 25 cm cubical wax phantom. The ionization chamber con-

[1] Publication approved by the director of the National Bureau of Standards of the U. S. Department of Commerce.

[2] F. L. Mohler and L. S. Taylor, *Bureau of Standards Jour. Res.*, 13: 659, 1934.