for each section of a specimen added together. The planimeter was adjusted to read in cm². Volume of the specimen was then calculated in the following manner:

$$\text{Volume} = \text{total area (in cm}^2) \times \frac{\text{thickness of section} \times \text{microns}^2 \text{ per cm}^2}{\text{diameters of magnification}^2}$$

$$\text{Volume} = \text{total area (in cm}^2) \times \frac{10 \text{ microns} \times 100{,}000{,}000 \text{ microns}^2}{200 \times 200}$$

$$\text{Volume} = \text{total area (in cm}^2) \times \frac{1{,}000{,}000{,}000 \text{ microns}^3}{40{,}000}$$

$$\text{Volume} = \text{total area (in cm}^2) \times 25{,}000 \text{ microns}^3$$

It has been found that figures for the volume of a specimen can be closely checked by repetition of the whole process including the tracing and planimetry.

It must be remembered that the two surfaces of a section of a spherical structure will have different areas unless the section is equatorial, but that in planimetry the section must be considered one of a cylinder. It may be possible to decrease such error by averaging the area of the two surfaces in order to approach the area of the mid-plane of the section. Whether such a technique would give more accurate absolute volume can not be stated, but it does not appear that it would offer advantages in determining relative volumes of different specimens. The same problem arises in connection with wax plate reconstruction where the wax plates must be cut perpendicular to the surface, thereby leaving edges which must be rounded off to produce a smooth contour.

The technique of planimetry is well known to the engineers but, so far as can be determined, this is its first direct application to volume studies of early embryos where it offers an easy and convenient method of determining the volume of irregular objects. Data resulting from this study will be presented in detail elsewhere.

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THE USE OF CHARCOAL TREATED PEPTONE IN MICROBIOLOGICAL ASSAYS

MICROBIOLOGICAL assays using the *Lactobacillus arabinosus* for the determination of nicotinic acid, biotin and pantothenic acid are widely employed.[1, 2, 3] Charcoal-treated casein hydrolysate forms the chief source of nitrogen in the medium used for these determinations. The preparation of the hydrolysate is laborious. If purchased commercially, it is expensive.

[1] E. E. Snell and L. D. Wright, *Jour. Biol. Chem.*, 139: 675, 1941.

[2] W. A. Krehl, F. M. Strong and C. A. Elvehjem, *Ind. Eng. Chem., Analyt. Ed.*, 15: 471, 1943.

[3] H. R. Skeggs and L. D. Wright, *Jour. Biol. Chem.*, 156: 21, 1944.

It has been found possible to replace the hydrolysate satisfactorily in media used for assay of biotin, niacin or pantothenate with charcoal-treated peptone. Blanks and maximal acid production obtained with the peptone are satisfactory and the preparation of the peptone is simple.

METHOD

100 grams of Bacto-Difco peptone are dissolved in 800 cc of distilled water. The pH of the solution is adjusted to 3.0 with concentrated HCl. A faint cloud forms at this point. Twenty grams of the activated charcoal, Darco G60, are added and the mixture stirred mechanically for an hour. The solution is then filtered by suction. The pH is readjusted to 3.0 with concentrated HCl, 10 grams of Darco G60 added, and the mixture stirred for an hour, after which it is filtered by suction. The filtrate should have no more than a faint tinge of color. The volume is adjusted to one liter and the solution preserved under toluene. Ten cc of this solution are substituted for each 5 cc of casein hydrolysate in the medium of Krehl, Strong and Elvehjem.[2] The peptone should be tested before being used for assays. If the peptone has been properly prepared, less than 2.0 ml of 0.1 N acid will be produced in tubes from which one of the growth factors has been omitted and at least 17 ml of 0.1 N acid will be produced after 66 hours' incubation at 37° C. in the presence of 2.0 micrograms of calcium pantothenate, 2.0 micrograms of nicotinic acid and 0.01 micrograms of biotin.

The blanks and maximal acid production obtained with a typical lot of peptone when substituted for casein are compared with the blanks and maximal acid production obtained with casein hydrolysate in Table 1.

TABLE 1

BLANKS AND MAXIMAL ACID PRODUCTION OBTAINED WITH CHARCOAL TREATED PEPTONE AND CASEIN HYDROLYSATE

Vitamin	Peptone		Casein	
	Blank	Maximum	Blank	Maximum
Biotin	1.5	18.1	1.74	17.55
Pantothenic acid	1.9	18.6	1.2	18.7
Nicotinic acid	0.84	19.0	0.6	18.3

All results are expressed as cc of 0.1 N acid produced after 66 hours' incubation, and are the averages of duplicate determinations.

TABLE 2

COMPARATIVE ASSAY VALUES FOR RAT URINE FOUND IN PARALLEL RUNS USING PEPTONE MEDIA AND CASEIN HYDROLYSATE MEDIA

Test	Value with peptone medium*	Value with casein medium*
Nicotinic acid	1.6	1.65
Calcium pantothenate	6.2	6.3
Biotin	0.02	0.02

* Expressed in micrograms per ml.

Comparative assays for nicotinic acid, biotin and pantothenate using peptone and casein hydrolysate have yielded identical figures on a variety of materials.

A simple method is described for the preparation of charcoal treated peptone solution which may be substituted for casein hydrolysate in microbiological assays with *Lactobacillus arabinosus*.

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DISCUSSION

A PROPOSAL FOR THE FORMATION OF A WORLD ASSOCIATION OF PHYSICISTS OR NUCLEAR SCIENTISTS

THE construction of the atomic bomb was brought about chiefly by physicists. Two German chemical-physicists, Hahn and Strassmann, unmindful of the threat of impending war, gave to the world the key for unlocking the storehouse of one form of atomic energy. Physicists of the British Commonwealth and America, including recent refugee physicists from Continental Europe, under compulsion of self-defense in a war thrust upon us, have discovered new essential chemical elements and have carried through to a successful conclusion the vast enterprise of manufacturing atomic bombs of colossal destructive power. The war is over. Let us now organize a World Association of Physicists. Members in this association would subscribe to certain principles: (1) respect for and confidence in the labors of all its members irrespective of nationality; (2) a pledge not to give advice concerning, or assist in making, atomic bombs; (3) a pledge to continue research in fundamental physics, including the physics of the nucleus of atoms, all atoms; (4) to publish the results of such research; (5) to assist in experiments leading to the beneficial application of atomic energy to human problems, and (6) to welcome the physicists of other nations to our laboratories.

This association would be not only international, it would be supernational. At least its members would not take orders from any government to assist in making atomic bombs. And since its membership would probably include 99 per cent. of the physicists of the world, atomic bombs would not be made. For the making of such a bomb requires the ultimate in knowledge concerning radioactive and nuclear physics. No novice would dare handle the components of a bomb. To attempt to do so would probably lead to his own extermination and the extermination of everything and everybody in his vicinity. Workmen could not be hired to work in a plant in which the ingredients of a bomb were being assembled, unless they had vast confidence in the knowledge and skill of those in charge. All that would be necessary to bring about a complete exodus of workers from a plant would be for the leading physicists of the country to set forth their belief that the chief personnel of the plant were lacking in scientific knowledge and skill. The ingredients of atomic bombs would not be made in that plant.

The association would not be regarded as formed until 90 per cent. of the physicists of every major nation, as determined by the principal physics society of that nation, had subscribed to the principles and accepted membership. The holding back by the physicists of any major nation would release all tentative members of their pledges.

The details regarding officers would be worked out by representatives from the chief physics societies of the various major nations. This proposal, perhaps with variations, will be submitted to the members of the American Physical Society and affiliated societies at their forthcoming meeting in New York.

It is believed that the formation of an association of scientists as above outlined would do away with warfare by atomic bombs. There would remain the gentle kind of warfare that was in vogue up to August 5, 1945. Perhaps associations of scientists could outlaw also that kind of war.

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REVERSAL IN THE WINTER FLOUNDER, PSEUDO-PLEURONECTES AMERICANUS: THE THREE KNOWN CASES

IN 1935, in a paper on "Reversal of Sides in Flatfishes,"[1] I brought together all the accounts that I could find of reversal in flatfishes, and tabulated the specific data (dates, sizes, figures, etc.). After a careful search I found a solitary record of a reversed *Pseudopleuronectes americanus*.

No. I. In "Biological Notes" from Woods Hole, Mass.,[2] is this record from Vinal N. Edwards. "*Pseudopleuronectes americanus:* A male in spawning condition, 14 inches long, taken in a fyke net in Waquoit Bay, February 23, 1900, has eyes on the left side—the first of the kind I have taken." To those who know the meticulous care with which for over 30 years Vinal Edwards made his records, nothing more need be said. What became of this first recorded reversed winter flounder is not known, but it remained a unique record for over forty years.

[1] E. W. Gudger, *Jour. Morphol.*, 38: 1–39, 5 figs.
[2] V. N. Edwards, *Bull. U. S. Bureau of Fisheries*, for 1899, 1901, vol. 19, p. 305.