and Whitehaven. During this trial the diving fin was found to be too light in construction; it bent under the increased pressure, and the body was lost.

It is hoped to continue experiments with this type of collector in the future. The instrument can be made inexpensively, and may be of great service for collecting uninjured living plankton quickly over a wide area in the sea or in lakes. I am indebted to Prof. J. H. Orton for assistance and advice in this work.

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Refractive Indexes of Helium I and II

THE refractive indexes of liquid helium I and II have been measured by the use of a Wollaston cell as previously described[1].

The values obtained for the index for λ 5461 A., with their estimated errors, were as follows:

	Temp. (° K.)	Critical angle	Refractive index	$\frac{\mu^2-1}{\mu^2+2}\cdot\frac{1}{\varrho}$
He I	4·22	78° 28′ ± 20′	1·0206 ± 0·0012	0·109
He I	2·26	76° 51′ ± 5′	1·0269 ± 0·0004	0·122
He II	2·18	76° 51′ ± 5′	1·0269 ± 0·0004	0·122

These values agree with the preliminary value 1·028 ± 0·006 obtained by Wilhelm and Cove[2] for the index for helium II. The value of μ^2 at 2·18° K. is 1·0545, which corresponds closely to the dielectric constant $K = 1·0558$ [3].

In order to ascertain whether there was any difference in the molecular refractivities of helium I and II, the observing telescope was set on the critical edge in He II at 2·18° K. Then the temperature was raised through the λ-point to 2·26° K., where the density is the same to within 0·00005. In passing from one temperature to the other several times no change in the position of the critical ray resulted. A change of one minute of arc could have been detected easily in this way. Therefore the index changes by less than 0·00007 in passing from a point in He II to a point with the same density in He I.

The work was carried out by Prof. J. O. Wilhelm, Mr. H. E. Johns and Prof. Grayson Smith.

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Natural Activation of Papain

WORKING with latex of *Carica papaya*, we were able by different methods (dialysis, precipitation, etc.) to separate the natural activator from the enzyme system.

When solutions containing the activator were added to a latex preparation ('centrifugate') which split up gelatin, but not peptone, peptone hydrolysis was induced; with commercial papain, again, the otherwise small peptone hydrolysis was considerably enhanced. No increase in the hydrolysis of gelatin on addition of the natural activator solutions was observed; in many cases a decrease in activity was actually produced. The activator solutions showed *inter alia* strong sodium nitroprusside and ninhydrine reactions and gave the characteristic cuprous salt on treatment with cuprous oxide in acid solution. The solid residue obtained on decomposition of the cuprous salt showed the properties of glutathione. The admixture of this product with pure glutathione did not produce a pronounced depression of the melting point.

On adding pure glutathione to 'centrifugate' or to commercial papain, the induced or, respectively, enhanced peptone hydrolysis observed even at comparatively low concentration of glutathione reached the value attained on activation by prussic acid. Hydrolysis of gelatin by the same enzyme preparations, on the other hand, was decreased by addition of small quantities of glutathione. When, however, greater quantities of the latter were added, the primary inhibition was annulled, and with comparatively large amounts of glutathione, stimulation of gelatin splitting was observed.

The chemical behaviour of the natural activator, and the corresponding action of the natural activator and of glutathione on the hydrolysis of peptone and gelatin, make it probable that the natural activator is glutathione. A decisive proof on this question must await complete chemical analysis. For seasonal reasons, some months must elapse before the large amount of latex required for the preparation of sufficient material for a full chemical analysis will become available to us. A final and detailed report will be published elsewhere at a later date.

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Standardization of Potato Slopes for Bacteriological Tests

IT is common to find differences in the growth of sub-cultures of the same bacterium on potato slopes, and it also frequently happens that there is a percentage of unsatisfactory slopes in a batch of potato medium after sterilization. Possibly our experience in trying to standardize this medium for work in this laboratory may be of use to other microbiologists.

Thirteen varieties of potato have been tested, and all of them have been used fairly soon after lifting. The cut blocks are washed in running water for at least 12 hours, and then put in test tubes resting on a small wad of cotton wool, and the tube is filled with distilled water until the potato wedge is completely covered; this water is poured away after sterilization just before the tube is inoculated. The substitution of normal saline solution does not improve the final character of the slope. We have tried various methods of sterilizing to see whether this effects the condition of the wedge: steaming on three successive days, autoclaving once for fifteen minutes at three different pressures, namely, 5 lb., 10 lb. and 15 lb., and autoclaving for five minutes on each of two successive days at the same three pressures.

The results from these different methods are not conclusive. In every case the sterilization has proved adequate, since no contaminations have occurred, at least within a period of six weeks, but, on the whole, the wedges remain in better condition after two short