and that without scientific guidance a third experiment may not turn out any better. Is it not clear that this failure in the past, and possibly in the future, is due to the popular ignorance as to the underlying scientific facts? Is it not also true that it is only such scientific men as we who are gathered at this meeting that can supply and interpret the facts?

You may not believe it, but it is true, that a large, conscientious, determined and utterly ignorant element among our fellow citizens honestly believes that "beer is more intoxicating than distilled spirits." Not one legislator in a hundred realizes, until it is explained to him, that to allow spirits to be dispensed under the same conditions as the merely fermented beverages is equivalent to allowing tobacco shops to sell morphine and cocaine under the same conditions as tobacco.

Our British colleagues have served their nation much better. They have the great tradition and institution of royal commissions and similar advisory bodies that in England are so effective in the fundamental direction of national policy. On the alcohol question the facts and their meaning have certainly never been put more clearly than they were by a committee that reported a few years ago to the British Liquor Control Board. On that committee were such men as Cushny, Dale, Newman, Mott, McDougal and Sherrington. What they reported was virtually nothing more nor less than that the mass law of chemistry applies to alcoholic beverages. Those beverages that are concentrated are powerful and harmful in their effects. Those that are dilute are relatively innocuous. So clear was their report both in its presentation of facts and in the inference derived from those facts, that the Judiciary Committee of the Senate embodied the whole British statement in its own report.[2]

I have not the time in a mere after-dinner speech to develop this topic in detail. I have done so, however, in an article soon to appear in a general journal.[3] But is it not clear, when we face the facts known perfectly well to all of us here at this meeting, that the line of public policy and legislation that should be followed, that must be followed, if the evils of alcohol are to be minimized, is that of substituting the more dilute for the stronger alcoholic beverages?

I ask your cooperation in teaching the American people, and particularly the legislators, the mass law in its application to alcoholic beverages.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A LOW-COST LABORATORY UNIT FOR LIGHTING AND APPLIANCES

A LABORATORY table lighting unit has been designed for individual or class use to provide a satisfactory artificial light source for both high power microscopy and table or stage dissection, providing also outlets for electrical appliances. It is believed that the improvements incorporated will be of extended use where economy (*i.e.*, construction, installation charges and operation) must also be taken into consideration. The major points concerning the fixture are the utilization of the recently developed inside frosted blue daylight lamps in the larger sizes, suitable for use in naked fixtures without color filters or globes, and the convenience-outlets so often beyond reach but here made a part of the lighting fixture.

(1) Provision is made for interchangeable use of lamps from 150 to 300 watts, maintaining the center of illumination within the fixture by socket extensions for the 150 watt and 200 watt sizes, and employing the medium-screw "skirted" base for the largest size. Inside frosted Mazda blue daylight lamps are recommended for the reasons indicated in paragraph 3.

(2) Beam intensity values at the table top and 30 inches from the base of the unit, with the lower edge of the reflector hood 17 inches above the table top, for three sizes of inside frosted blue daylight lamps with same position of light-center, are as follows:[1]

Lamp size in watts	Socket extension	Intensity in ft. candles at 30° from plane of table[2]	Intensity in f-c in plane of table
150	3	23	9
200	2	30	13
300	0	41	16

(3) The quality of the light from the inside frosted blue daylight lamp matches average daylight suitably well for general use, and for those who are accustomed to studying by the latter medium this quality is an appreciable gain over the inside frosted white or the clear daylight incandescent lamps.

Normal lamp life is anticipated in the ordinary operation of the inside frosted blue daylight lamp in the fixture. It is pointed out, however, that the color

[2] Senate Report No. 1105, 72nd Congress.

[3] *Harper's Magazine* for June, 1933.

[1] Measured with Weston Model No. 603 Photronic Illumination meter, equipped with a green-yellow filter so that the color sensitivity of the instrument matched that of the human eye.

[2] Ca. angle of microscope mirror.

quality, intensity of the light and the life of the lamp are dependently related. For a closer approach to average daylight the lamps may be operated at from 100 to 105 per cent. of their rated voltage. When the average line-voltage during normal operation is 115 volts (*i.e.*, at full-load conditions of the circuit being used) lamps having a rated voltage of 110 volts may be used. This results in 60 per cent. of lamp life, 107 per cent. watts consumed, 116 per cent. light intensity and a color quality richer in the blue. The cost of operation (lamps plus energy) under these conditions is not an increase per unit of light, and permits the use of smaller bulbs for the same intensity and of a whiter light.

(4) The fixture-unit (see Fig. 1) has been sturdily

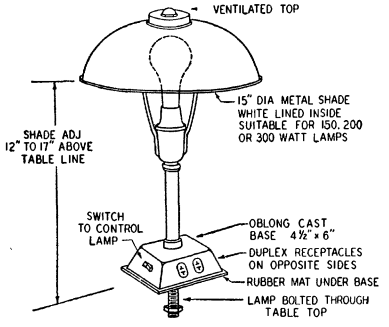

FIG. 1

built. It is flexible in construction, with parts readily accessible. The height of the unit may be adapted so that the lower edge of the reflector hood is fixed at some arbitrary distance above the table top; *e.g.*, 12 inches for tables using one or two microscopes and up to 17 inches for tables using 6 microscopes. The reflector hood is ventilated to provide better lamp life. Its stem is intended to be rigidly connected to the table top to facilitate concealed table wiring; but this may be modified at a slight additional cost to permit surface wiring or use as a portable unit. A rubber guard is placed between the base of the unit and the table top to protect the wiring from liquids accidentally spilled around the base.

(5) The duplex receptacle outlets have been located in the lamp base convenient for simultaneous use of four electrical appliances, such as stage warmers, micro incineration outfits, etc. A separate toggle switch controlling the lamp only is also located in the base of the unit.

(6) Finish of the unit is made durable by a dull black bakelite coated surface; but may be altered to match other requirements. The interior (*i.e.*, reflecting) surface of the hood is a matte white having a coefficient of reflection of 94 per cent. in comparison with a standard magnesia test surface.

The reflector hood is proportioned and located to minimize direct glare from the unit itself and also from units on neighboring tables. The lamp proper is placed in the "base-down" position and only a portion of the neck of the lamp is visible. When the inside frosted blue daylight lamp is used, this visible neck portion of the lamp is free from objectionable glare.

(7) Low cost is obtained because of the simplified design, use of standard fittings and standard lamps. This low initial cost is accompanied by decreased wiring costs when making the installation because both the lighting and receptacle outlet loads are furnished from the same branch circuit, thus making it unnecessary to provide one complete branch circuit for the lighting and another complete branch circuit for the receptacle outlets. This unit may be installed in an existing laboratory without prohibitive rewiring costs.

Laboratory replacements are in progress using this new fixture at the Marine Biological Laboratory, Woods Hole, Massachusetts, with the cooperation of the Biddle-Gaumer Company, Philadelphia, and the laboratory facilities of the Moore School of Electrical Engineering, University of Pennsylvania.

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A SIMPLE SUBSURFACE THERMOMETER

IN order that fishermen may take advantage of the findings of recent research into the relationship of fish to water temperature it is necessary that a subsurface thermometer be used in the course of fishing operations. The difficulty so far has been to devise an instrument of low cost. The apparatus described here entails only the purchase of an ordinary minimum thermometer. Since reversals of temperature gradient are comparatively rare, especially in water of less than 50 fathoms, the minimum thermometer can be used for practical purposes to give the temperature at the greatest depth to which it may be lowered.

The precaution necessary in its use is that it must be maintained in the horizontal position throughout the operation of lowering and hauling; otherwise the double-headed pin may slide. As a rule the pin is not very sensitive and will usually stand a tilt of as much as 30° without sliding. The accompanying illustration shows the means of maintaining the thermometer in the horizontal position.

It is suspended between the opposing pulls of a submerged float and a weight. The lifting power of the float is considerably less than the sinking power of the weight. The figure shows the apparatus resting on the sea-bottom, the usual position at which a temperature will need to be taken. The hauling