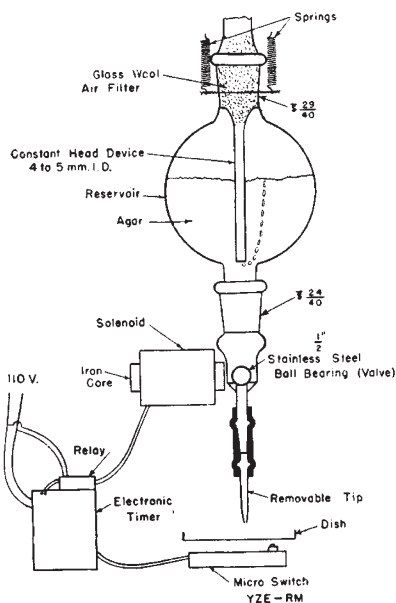


AN AUTOMATIC AGAR DISPENSER

By W. H. SCHMIDT*, M. D. REEVES†,
FRANCIS J. CASTLE and R. G. BENEDICTFermentation Division, Northern Regional Research
Laboratory‡, Peoria, Ill.

IN many laboratories various types of semi-solid culture media are routinely dispensed in Petri dishes for use in the study of micro-organisms.

The automatic agar dispenser described in this article was originally designed for rapid and reasonably accurate transfer of melted agar to plates for subsequent use in the assay of penicillin. A notice of this was published some time ago¹. Because of the interest shown in the apparatus by visitors from other laboratories, it appears desirable to publish a more complete description which will be more widely available. A drawing of the apparatus is reproduced herewith.



Assembly of agar dispenser

In principle, the device is simple. It consists of a constant-head reservoir which empties through a modified solenoid valve connected with an electronic timer. The only part of the apparatus considered difficult to make is the glass seat for the ball valve. This seat should be flattened so that no leakage can occur when the stainless steel ball is in its normal position. When the micro switch is pressed, the solenoid must not lift the ball but roll it to one side. Any timer, either mechanical or electronic, which makes or breaks a circuit may be used, the accuracy of the device depending upon the accuracy of the timer. The size of the glass reservoir for holding the agar depends on the quantities to be dispensed. For routine plate-pouring (20 ml. per plate), we use a vessel with a total capacity of 2 litres. For dispensing smaller amounts of agar, such as those required

* Now associated with Schenley Laboratories, Lawrenceburg, Indiana.

† Now with the Department of Chemistry, John Brown University, Siloam Springs, Arkansas.

‡ One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U.S. Department of Agriculture.

for flooding assay plates (4 ml. per plate), a 500-ml. receptacle is used. A delivery tip with a much smaller opening is attached to this vessel.

Sterilization of the reservoir and valve in our Laboratory is effected by passing steam in at the top and permitting it to escape to a drain by raising the ball valve with a straightened paper clip inserted through a small opening in the rubber tubing. The constant-head device and delivery tip are sterilized separately in an Arnold steamer. Autoclave sterilization may be substituted when steam is not available on the laboratory table. To guard against the possibility of pressure developing in the reservoir during steam sterilization on the table, two steel springs, attached at the top of the standard taper (29/40) male joint, are clipped to loops at each end of a wire ring, shown at the top of the reservoir. Should the ball valve accidentally close during sterilization, slight steam pressure pushes the top male joint up to prevent breakage of the reservoir. In assembling the apparatus, we close this top joint with only moderate pressure and do not employ any lubricant. The lower joint standard taper (24/40) connecting the bottom of the reservoir with the glass assembly containing the ball valve is greased with a temperature-resistant chemically inert lubricant.

Data on accuracy of delivery are shown in the accompanying table. A 2 per cent agar medium was melted and cooled to 48° C. before transfer to the glass reservoir. The timer was set to deliver 20 ml. agar (ball valve opened and closed in 1.5 sec.).

Accuracy of delivery of automatic agar dispenser

Weight in grams of 20 ml. samples, reading down from left to right			
20.91*	20.60	20.54	20.40
20.80	20.72	20.65	20.32
21.08	20.62	20.28	20.27
20.76	20.32	20.74	20.30 (last sample)
20.64	20.71	20.41	
20.82	20.71	20.35	* First sample

Average weight of all samples delivered was 20.63 gm. Extreme variations from the mean value were +0.45 gm. and -0.36 gm.

One operator is able to handle thirty plates within 2-3 minutes. The dispenser is much simpler and faster than agar delivery by pipette, and more accurate than pouring plates from tubes containing measured amounts of the materials.

¹ Schmidt, W. H., *Bull. Health Organ., League of Nations*, **12**, 259 (1945-46).

FORTHCOMING EVENTS

(Meetings marked with an asterisk * are open to the public)

Monday, December 6

FARMERS' CLUB (at the Royal Empire Society, Craven Street, Strand, London, W.C.2), at 2.30 p.m.—Dr. A. D. Buchanan-Smith: "Inheritance of Milking Capacity in Dairy Cattle".

UNIVERSITY OF LONDON (in the Department of Biochemistry, University College, Gower Street, London, W.C.1), at 4.45 p.m.—Dr. C. de Duve: "The Control of Carbohydrate Metabolism".* (Further lectures on Thursday, December 9, and Monday, December 13.)

UNIVERSITY OF LONDON (at the Institute of Education, Malet Street, London, W.C.1), at 5.30 p.m.—Mr. K. L. Little: "Education for International Understanding—Africa".*

SOCIETY OF CHEMICAL INDUSTRY (at the London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1), at 6.30 p.m.—Mr. H. Seligman: "Application of Radio-active Elements in Industry".*

ROYAL INSTITUTE OF CHEMISTRY (at Norwood Technical Institute, Knight's Hill, London, S.E.27), at 7 p.m.—Dr. A. Albert: "Drug Action, Ions and Neutral Molecules".

Tuesday, December 7

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX, NORTHERN BRANCH (at the North of England Institute of Mining and Mechanical Engineers, Neville Hall, Westgate Road, Newcastle-upon-Tyne), at 10 a.m.—Conference on "The Value of Organised Information Service to Industry, Commerce and Education".

EUGENICS SOCIETY (at the Royal Society, Burlington House, Piccadilly, London, W.1), at 5.30 p.m.—Mr. J. W. B. Douglas: "Maternity in Britain—the Results of a Social Survey".*