A DEVICE FOR REGULATING THE TEMPERATURE OF INCU BATORS EITHER ABOVE OR BELOW ROOM TEMPERATURE.

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It is frequently desirable in studying the effect of temperature on living organisms to have a convenient means of regulating the temperature of an incubator or series of incubators within the range of from 5–40°C. For this purpose it is essential to have a regulating device which is reliable over long periods of time with a variation of 0.2–0.3°. As far as the author is aware no convenient method has been described for this purpose.

The device described in this paper has been in use continually for several years and has proved reliable and accurate. It consists essentially in regulating the flow of water through the jacket of a double-walled incubator. This is accomplished, as shown in Fig. 1, by causing a relay to direct a stream of water either through the incubator or to waste as required by the temperature changes. This is brought about by means of a wire D soldered to the armature of the relay and attached at the other end to a glass pipette at the end of a vertical rubber tube. The current necessary to move this wire and pipette is so small that it is unnecessary to use a secondary circuit. The relay is actuated directly by the same circuit which goes through the regulator. With a relay of 150 to 200 ohms resistance, a potential difference of about 1 volt is necessary. This may conveniently be obtained from the ordinary lighting circuit by the use of lamps as shown in Fig. 1. The regulator may be any convenient type, either mercury-toluene or bi-metallic. It is placed in the regular position in the incubator.

The adjustment for temperatures higher than that of the room is as follows: Hot water is allowed to run in a slow stream from the
310  A DEVICE FOR REGULATING TEMPERATURE

pipette A which is so adjusted that, when the circuit closes and the armature of the relay is pulled over, the water flows into a funnel B placed near the opening C in the incubator jacket and thence to waste. When the circuit is broken the water flows into the incubator and so raises its temperature. The overflow from the incubator

FIG. 1. Device for regulating the temperature of incubators.
runs off from the top of the water gauge on the side of the incubator (not shown in Fig. 1).

The adjustment for temperatures below room temperature is identical except that cold water is run through A and the relay so adjusted that the water runs into the incubator when the circuit is closed and to waste when the circuit is open. Temperatures to 8 or 10°C. may easily be maintained by the use of ice water.

When temperatures within the range of variation of the room are desired, a slow, continuous stream of cold water is run through the incubator and warm water is run through the pipette connected with the regulating device.