reducing temperature would hasten their reaction or improve their winter pelts. All animals were fed the usual summer diet of red meat (until September 15).

Controls put on winter prime pelts at the usual time in October and early November or later, whether they had distemper or not.

Six of the experimentals reached normal winter prime pelt before September 18, except for slight reddish color due to the red meat diet: one female before August 17, the hottest of summer time; two others before September 1 and 6; two males before September 12 and one before the 18th. Another female barely failed to complete prime coat before September 12 and two others (♂ + ♀) loosened summer fur but failed to grow winter pelt except on the tail. Refrigeration may perhaps have helped one male slightly toward prime coat; but it was completely ineffective with the female similarly treated.

Other experimental females failed to show any change of pelt except to have a few hairs become loose in September and October and failed to assume prime winter pelt even at the usual time before November 7. They were apparently rather drastically upset by the irregular changes in length of day just about the time they were beginning to become responsive.

It is, therefore, indicated that the assumption of winter prime pelt by mink may be induced in summer in spite of relatively high temperatures or hastened in autumn by reducing the duration of the periods of light (and/or its intensity) to which the animals are exposed daily. Reduced temperature is, apparently, at most, a minor factor in this reaction.

The complete experiment will be described in detail elsewhere.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

A GLASS AND RUBBER LABORATORY PUMP

THE pump to be described here is a modification of one designed by Palmer.[1] Like Palmer's, it is operated by compressed air, and the fluid being pumped is in contact with glass and rubber only. It has the added advantages of greater capacity—1,500 cc per minute against a pressure of over a meter has been attained—and of operating in any position.

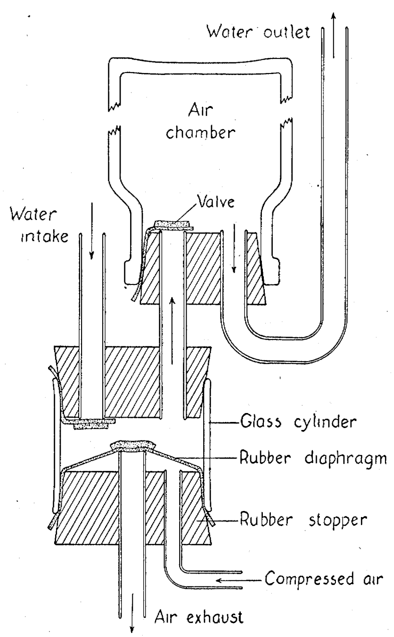

FIG. 1. Section of pump.

[1] J. Palmer, SCIENCE, 80: 229–230, 1934.

The construction is shown in Fig. 1. The cylinder is made of a piece of Pyrex tubing with an internal diameter of two inches. Considerable strength is necessary, but for pumps built on a smaller scale Pyrex need not be used. The diaphragm and valves are of rubber dam about 1/40 inch thick. They must not be stretched too tightly. *Ecru* dam should be used; the "buckskin" rubber dam popular with dentists fails after two or three weeks. The life of these parts is increased by attaching with rubber cement a small piece of rubber (*e.g.*, inner tube) to the diaphragm and to each valve, as shown in the figure. The ends of the tubes over which the valves and diaphragm fit should be ground to an even rim and fire polished. All stoppers must be wired in place.

A head of water (or of whatever fluid is to be pumped) is necessary at the intake. This fills the cylinder, pressing down on the diaphragm, and passes up through the air chamber and outlet tube to a height equaling the head at the intake. When the compressed air is turned on, the diaphragm is lifted, closing the intake valve and driving the water through the outlet, but the weight of the water, opposed only by atmospheric pressure in the exhaust, holds the diaphragm against the end of the exhaust for some time. Finally, the increasing pressure below the diaphragm lifts it off the exhaust, allowing the air to escape and the diaphragm to fall. As it falls, the cylinder is refilled through the intake, the exhaust is closed, and the process starts again. Each cycle moves only three or four cubic centimeters of water, but the pump operates at about six strokes per second. The flow of compressed air must be carefully adjusted by a clamp close to the pump to achieve the maximum rate of pumping; too rapid flow will cause the diaphragm to buzz without accomplishing anything. The pump is sometimes temperamental about starting. Very often the trouble can be traced to faulty construction, but it is also true that valves and diaphragm improve after they have been in place for a time. Once started, the pump will run for weeks without attention. Sometimes the air is slowly absorbed from the air chamber and must be replaced. This can be done by blowing air through the intake. The pump will work in any position, but the air chamber must be more or less vertical with the stopper down.

High efficiency depends chiefly upon well-fitting valves and rapid inflow. As many as four parallel intake tubes have been put in with very satisfactory results. The writer has for the most part used the pump simply submerged in the barrel of sea water that was being circulated. The exhaust tube was, of course, extended to a point above the surface of the water.

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AN INEXPENSIVE WARM STAGE

A WARM stage is a very useful addition to the microscope, particularly for such investigations as the demonstration of motile amoebae in stools. Where only an occasional examination is made, the cost ($15 to $20) is likely to be prohibitive.

A very serviceable stage can be made at a trivial cost from an electric iron heating element. This comes copper clad and slotted as shown in the drawing. It draws 550 watts at 110 volts, becoming red hot. However, if it is connected to the secondary terminals of a

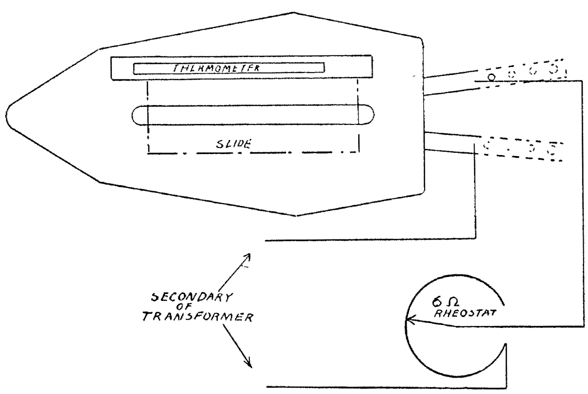

FIG. 1

bell-ringing transformer, it does not take much current and rises to a temperature of 40° C. or less. By connecting a 6-ohm radio rheostat in series, the current can be regulated so as to maintain a temperature of 37° C.

The construction is quite simple. With a hack-saw or grindstone, remove most of the side of a piece of $\frac{1}{8}''$ pipe about $3\frac{1}{2}''$ long, leaving both ends. This furnishes the thermometer carrier. The slot enables the operator to read the temperature. Lay the element on a piece of asbestos and connect the terminals to the 110-volt mains. The element becomes quite hot in a few seconds. Place a strip of solder about $\frac{1}{2}''$ from the slot. Place the pipe on the molten solder and disconnect the electric current. When cool, the pipe will be firmly fastened to the element. Cut off the portion of the element terminals shown in dotted lines and solder wires to them. Connect these wires to the transformer through the rheostat.

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