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Automatic Still from Stock Glassware

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AN AUTOMATIC STILL FROM STOCK GLASSWARE

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The author wishes to pass on to others any ideas they may find useful of those developed in constructing an automatic water still from material at hand.

After some preliminary experience with a still of about one quart per hour capacity using a gas-heated hypsometer from the physics equipment as the boiler, an electrically heated still of some two liters per hour capacity was set up. An inverted 5-liter pyrex balloon flask serves as the boiler. A water inlet, an overflow, a drain, a steam delivery tube, and two electrical wires pass through the rubber stopper.

The water inlet delivers hot water from the condenser system into a jacket around the constant level overflow tube, from which water needed to replace evaporation and "bleeding" flows out into the boiler proper. The excess overflows into a leaking can which carries a float. The float in turn carries mercury into which two wires dip and close the circuit when the can is full. If for any reason the water supply should fail, the leaking of the can will allow the float to fall and shut off the power from the boiler.

A Woulfe bottle several feet above the boiler and furnished with a constant level overflow supplies water at a constant pressure. The water passes in series through three condensers and then to the boiler. The first of the condensers (the last reached by the distillate) serves only to cool the distilled water after condensation in the other two, and before dropping into the carboy that is used for a reservoir.

To prevent the accumulation of a high concentration of solids in the boiler water, a small "bleeder" tube is provided which allows water to drip through a jet at a rate about half that of the distillate. This serves also as a drain for the boiler after the operation is suspended.

The heating element in the boiler consists of a coil of bare chromel wire--about one third of a hot-plate replacement coil--supported out of contact with the walls of the boiler flask, and completely immersed when in operation. Its power consumption is about 1500 watts.

With internal heating the glass (pyrex) walls of the boiler have proved to be sufficient insulation, so it is possible to leave the interior of the boiler exposed to full view, making inspection easy at all times.

(This is a condensation of the paper presented at the 1941 meeting)