

through the apparatus has demonstrated that many difficulties are encountered in adjusting and maintaining the proper rates of flow.

Dobry very kindly allowed me to see the manuscript of his paper before publication. The points made in this letter were put to him then and should be restated, in order to make clear the usefulness of electroconvection. Production units utilizing this principle have been built on a large scale and work satisfactorily, without any difficulty in heat dissipation.

SAMUEL RAYMOND

University of Pennsylvania Hospital,  
Philadelphia

#### References

1. R. Dobry and R. K. Finn, *Science* 127, 697 (1958).
2. J. S. L. Philpot, *Trans. Faraday Soc.* 36, 38 (1940).
3. S. Raymond, *Proc. Soc. Exptl. Biol. Med.* 81, 278 (1952).
4. ———, *Science* 118, 388 (1953).

We read the comments of Raymond with great interest. Raymond contributed a great deal to the development of electroconvection. One can, therefore, understand his concern at what may appear to be a misrepresentation of this method.

In discussing the matter further, let us differentiate between the principle of the technique as set forth by Kirkwood and his coworkers and the improved apparatus which is available today. Our comments were directed entirely toward the former.

In one of his publications (1) Raymond writes, "At these levels [power inputs of 50 watts and up], also, the cell temperature must be expected to run several degrees above the temperature of the circulating buffer, because of the difficulty of heat transfer through the streamlined currents in the channel." Earlier observation of thermal disturbances was also reported by Nielson and Kirkwood (2). It appeared to us that larger apparatus would have a smaller capacity for heat dissipation—that is, less cooling surface per unit of working space. As a result, liquid would tend to rise in the center of the column, where temperature is at a maximum, and settle near the cooler walls, thus upsetting the laminar convection pattern which is essential for this technique.

It is good to know that Raymond managed to handle this problem successfully in production as well as laboratory units.

REUVEN DOBRY

Pacific Yeast Products, Inc.,  
Wasco, California

#### References

1. S. Raymond, "Electroconvection" (E-C Apparatus Company, New York), p. 39.
2. L. E. Nielson and J. G. Kirkwood, *J. Am. Chem. Soc.* 68, 181 (1946).

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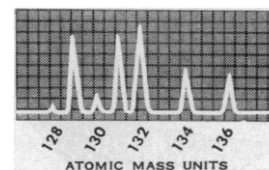
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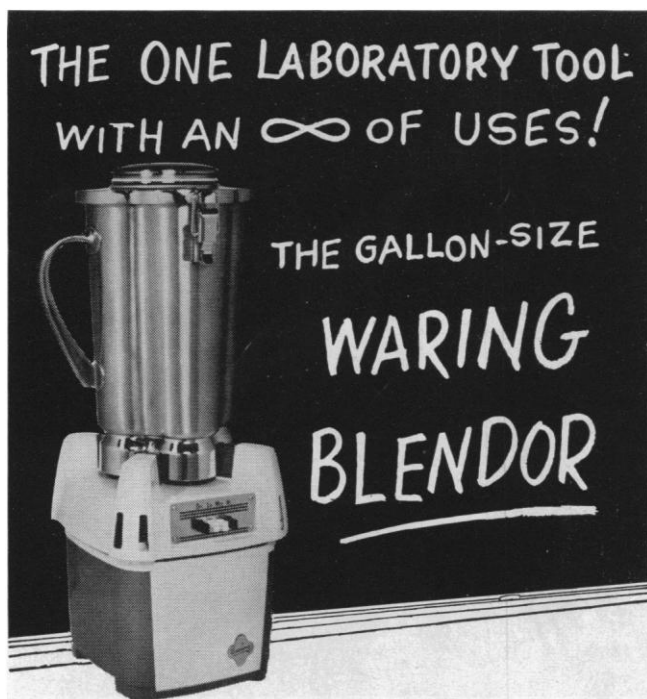
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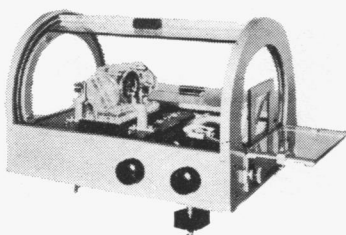
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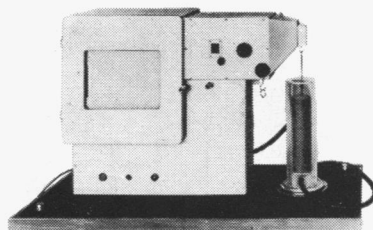
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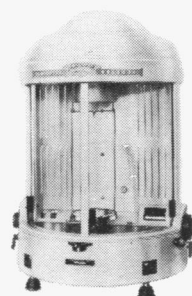
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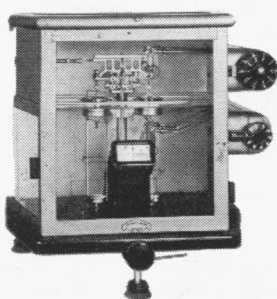
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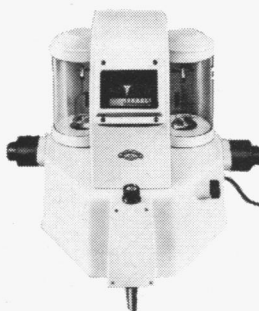
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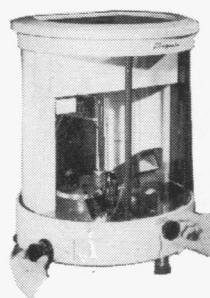
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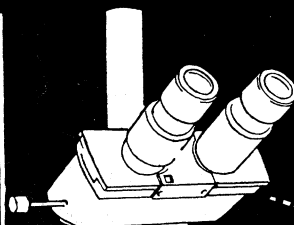
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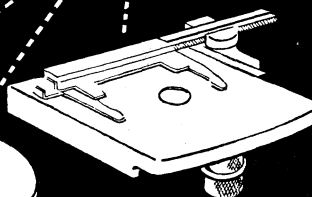


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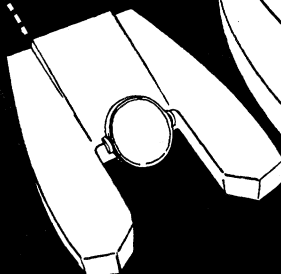
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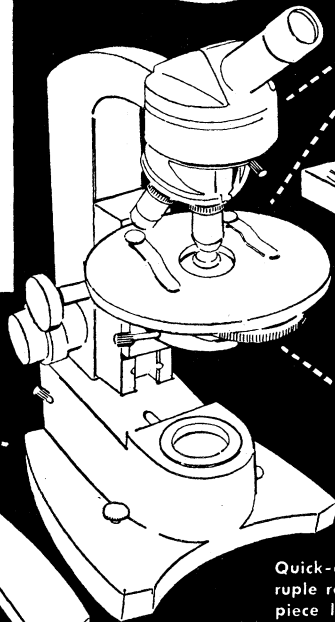
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