increased electrolyte excretions may be interpreted as a phase of decreased adrenal cortical activity due to withdrawal of the ACTH.

The attacks of acute gouty arthritis began during the third and fourth days of the postinjection period, when the electrolyte and water diuresis was almost completed. Each attack resembled the classic picture of acute monoarticular arthritis. The two patients who did not develop acute arthritis nevertheless exhibited similar changes in urinary excretion during and following the administration of ACTH. This sequence of electrolyte changes in gouty patients has previously been described as "the gout cycle" (*6*).

In two attacks, one of which had been provoked by ACTH and the other by a mercurial diuretic, 200 mg ACTH given over a 36-hour period starting on the first day of the attack was followed by a disappearance of joint signs within 48 hours after the injections were completed. Untreated attacks of acute arthritis in these patients had previously lasted 10 to 14 days. The increased electrolyte excretion following the mercurial diuretic mimics "the gout cycle" and in this manner may be involved in precipitating the attack of acute arthritis.

The results suggest that stimulation of adrenal cortical function is the common pathway in the precipitation of acute gouty arthritis by nonspecific stress and that pituitary adrenocorticotropin may be useful as a provocative and therapeutic agent in gout.

Since this work was completed, similar results have been reported in one patient (*3*).

References

1. Hellman, L., Weston, R. E., Escher, D. J. W., and Leiter, L. *Fed. Proc.*, 1948, **7**, 52.
2. Leblond, C. P., and Segal, G. *Compt. rend.*, 1938, **128**, 995.
3. Robinson, W. D., Conn, J. W., Block, W. D., and Newburg, L. H. *Proc. Cent. Soc. clin. Res.*, 1948, **21**, 23.
4. Selye, H. *J. clin. Endocrinol.*, 1946, **6**, 117.
5. Shipley, R. A., Dorfman, R. I., Buchwald, E., and Ross, E. *J. clin. Invest.*, 1946, **25**, 673.
6. Talbott, J. H., and Coombs, F. S. *J. A. M. A.*, 1938, **110**, 1977.
7. Talbott, J. H., Jacobson, B. M., and Oberg, S. A. *J. clin. Invest.*, 1935, **14**, 411.

A Simple Method for Welding Thermocouples

James A. Riley

Section of Neuro-Anatomy,
Yale University School of Medicine

The use of thermocouples in physiological problems, for such purposes as recording respiration or blood flow, necessitates the use of very small wires which often are very difficult to solder or braze by conventional methods. Furthermore, the sensitivity of the thermocouple is dependent on the type of joint, for a large juncture allows local currents of considerable magnitude to flow, thus reducing the effective voltage output. The introduction of foreign metals in the soldering or brazing process sets up contact electromotive forces with the same deleterious effects.

These metals may be welded, however, by the method to be presented here. The materials necessary are shown in Fig. 1. It is simply a metal cup containing a few

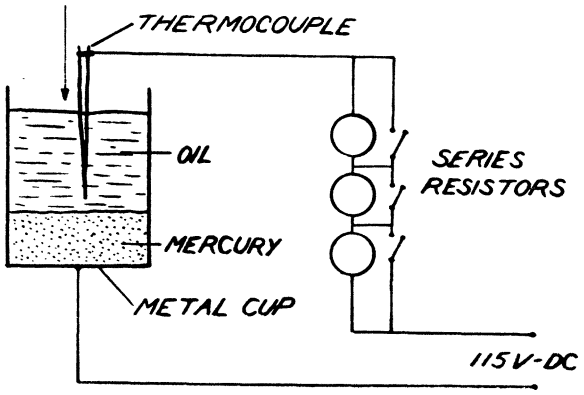

FIG-1

millimeters of mercury under about 2–3 cm of oil. Mineral oil or 10–30W motor oil may be used. In the apparatus now in use in this laboratory, the cup consists of the inverted metal shell of a vacuum tube with a grid cap (6J7). The cup is connected to one side of the d-c main, and the thermocouple wires to the other side through a series resistor as shown. The thermocouple is then moved down to touch the surface of the mercury and withdrawn. Welding is accomplished by heat from the arc formed at the moment of contact with the mercury. A "buzz" accompanied by slight boiling in the oil layer signifies good contact. The size of the series resistor depends on the size of the wires to be welded, as a larger current will be required for larger wires. We use a 400-w heating element for 0.3-mm iron-constantan couples. A little experimentation will quickly show the optimum value of current, as too much current causes burning of the wires with a large junction, and too little current does not weld at all.

The method of preparing the wires for welding is as follows: They are first twisted tightly together for a distance of several millimeters; the distal end of the twisted junction is then cut off so that only a turn or so remains. The wires are now ready to weld, and after welding they may be untwisted if any of the twisted portion remains unfused, so that the wires are joined only by a small ball of fused metal. This ball should be as small as possible, without sacrificing the strength of the joint.

This method has been utilized with iron-constantan, platinum-platinum-rhodium, chromel-alumel, and copper-constantan couples, with wire sizes from 0.1 mm to 4 mm. A larger cup with more and heavier oil is required for the larger wires. The circuit should be fused in all cases.