Thermo-Regulator^{1,2}By E. B. Starkey and N. E. Gordon³

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THIS thermo-regulator was designed to meet the needs of the individual student in physical chemistry. It has an accuracy to 0.05°C. , and does not require relay or battery. Furthermore, the point of contact is enveloped in an atmosphere of inert gas, and, hence, there is no oxidation at the point of contact.

The accompanying figure shows the model that was designed to meet the above requirements. The U-tube is filled with mercury until level with the bottom of the capillary

tube *c*. The capillary tube which has a diameter of 0.50 mm. is then sealed by a drop of mercury, *d*, put in through *s*, enclosing a column of air in the capillary. This air after one or two contacts is deprived of its oxygen, leaving inert nitrogen. The rest of the thermo-regulator is easily filled with toluene through *o*. When the toluene has gone over through *t* and finished filling the U-tube, a ground-glass stopper is firmly placed in *s*. The filling is continued until the toluene passes up through the stopcock *T*. The thermo-regulator is now ready for use. It is placed in series with an electric light, *l*, from a 110-volt line. One contact is made at *b* and the other at *c*. The *b* contact may be made by means of ordinary copper wire, *w*, but the contact at *c* is made by

means of a platinum wire, *p*, 0.355 mm. in diameter, passing through the ground-glass stopper and just reaching to the surface of the mercury at the bottom of the capillary tube.

The light *l* and thermo-regulator are placed in the bath, and the current is turned on, with the stopcock at *T* open. As the temperature rises the toluene expands up into the tube above the stopcock *T*. When the desired temperature has been obtained the stopcock *T* is closed, and any further expansion results in breaking the contact at *c*, when the light goes out. As soon as the bath begins to cool, contraction takes place and contact is again made at *c*, when the light is again thrown on. The inert gas acts as a condenser and scarcely any spark is noticeable, and since this slight spark takes place in an inert gas no corrosion at the point of contact results.

The commendable features which our thermo-regulator claims are:

- 1—The ease with which it can be made and filled.
- 2—The ease with which it can be regulated.
- 3—The doing away of relay and battery.
- 4—The protection of the point of make and break from all corrosion.

Creative Thought

By H. W. Jordan

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"Creative thought has raised man from his pristine, sub-savage ignorance and squalor to the degree of knowledge and comfort which he now possesses. On his capacity to continue and greatly extend this kind of thinking depends his chance of groping his way out of the plight in which the most highly civilized peoples of the world find themselves. Creative thought is the only hope of the future."

Prof. James H. Robinson, in "The Mind in the Making," a book recently issued by Harpers, sets forth the profound contrast between the dynamic, creative thought of the scientists and the static, frozen thought of the directors of mental life, especially those of government and education. We are oppressed by war and social chaos because the scientists' type of thinking has not been applied on any considerable scale to the solution of those world problems that spring from modern city industry operated in an eighteenth-century intellectual environment.

"It is an easily demonstrated scientific truth that in all ranks may be found evidence of unrealized capacity; and that we are living on a far lower scale of intelligent conduct and rational enjoyment than is necessary," says Professor Robinson. He makes it plain that if we would tap the limitless reservoirs of creative thought we must explore them by scientific research and by science applied to the social mass mind as we have applied it to the potential forces of nature.

Slavish bondage to such incongruous practices as assembly of our national congress thirteen months after its election, and inauguration of our President four months after his election, in an age when assemblywomen fly to Topeka, is proof that mental habits continue long after their purpose has ceased and their origin has been forgotten.

Among efforts to improve business and to place our modern chemical and engineering industries far ahead of normalcy, the most promising is creative thought applied to the mass human mind by scientific research.

"The Mind in the Making" is regarded by many chemists as the most illuminating recent scientific analysis of the social industrial situation.

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