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SCIENCE AND ETHICS[1]

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THE American Association for the Advancement of Science met last in Indianapolis in 1890, and on that occasion the retiring president, Thomas Corwin Mendenhall, delivered the annual address on "The Relation of Men of Science to the General Public." Following forty-seven years later in his footsteps, I know of no matter of greater concern to men of science and the general public than science in its relation to ethics. I know full well that there are many scientific specialists who maintain that science has no concern with ethics, its sole function being to seek the truth concerning nature irrespective of how this truth may affect the weal or woe of mankind. They may recognize that the use of science for evil threatens peace and progress, but they feel no responsibility to help avert disaster. The world may be out of joint, but they were never born to set it right; let the shoemaker stick to his last and the scientist to his laboratory.

During the dark days of the world war I once spoke to a distinguished scientist of some major event in the course of the war and he looked up from his work and said sharply, "What war?" Concentration upon our various specialties is essential, but it should not cause us to lose our sense of orientation in the world. It is pleasant and at times necessary to avoid "the tumult and the shouting," but there is no excuse for the scientist who dwells permanently apart from the affairs of men. At the present time it is probable that nothing else so deeply concerns the welfare and progress of mankind as ethics.

In the early years of the association a favorite theme in the annual address of the retiring president was the

[1] Address of the retiring president of the American Association for the Advancement of Science, Indianapolis, on December 27, 1937.

this is practiced, however, it will be found that in a certain percentage of cases air will be imprisoned in the upper coils of the cochlea and at the apex of the semi-circular canals, thus leading to an imperfect cast. If a positive pressure is applied to the molten metal in the labyrinth the air is forced out through the pores in the bone and the canals completely filled with the metal, giving a true cast of the interior.

A piece of rigid tubing[3] 2½ or 3 inches in length is placed with one end over the fenestra rotunda and fenestra ovalis and a piece of ½-inch adhesive applied to the outer surface of the tube to hold it to the bone and to cover the openings resulting from the inequalities between their respective surfaces. Plaster of paris is next applied to the outer surface of the adhesive, bone and tube to seal their union. A piece of adhesive is placed over the internal auditory meatus and the entire petrous bone is covered with a thick layer of the plaster, leaving only the upper end of the tube projecting from the mass. After hardening, the mass is placed in a sand bath with only the upper inch of the tube above the sand, which is heated to 110°–120° C. Molten Wood's metal is now poured into the tube, almost filling it. A rubber cork previously bored to fit this tube is fitted over its upper end and pressure is applied by manually compressing an atomizer bulb the tube of which is adapted to the upper opening in the rubber cork. While the pressure is being applied the whole mass is removed from the sand bath and immersed in cold water. The plaster is immediately removed and the petrous bone with its attached tube is placed in 15 per cent. HCl until decalcification is complete. The organic matter can then be washed from the cast. The sprue interconnecting the labyrinth and tube is carefully cut across. If desired, the Wood's metal cast may be plated or invested in plaster and recast in any of the harder metals, giving a much more durable preparation.

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DIOXAN AS A FIXATIVE OF YOLK

DIOXAN has been known from the first publication of Graupner and Weissberger[1] as a very economical and convenient dehydrating agent. McWhorter and Weier[2] recommended its use as an admixture to the fixing fluids, Graupner and Weissberger[3] gave the description of a fixative consisting chiefly of dioxan. Nobody, however, as far as I know has remarked the advantages which result from the fixing of embryonal tissue solely by means of it.

The pieces of tissue to be fixed in dioxan are simply thrown into a container of that liquid, at the bottom of which lies a layer of calcium chloride. Such an arrangement has been devised for the dehydrating technique by Graupner and Weissberger.[1] After lying for a certain time in dioxan, the duration depending on the size of the piece of tissue, the material is transformed to a mixture of dioxan (5 parts), soft paraffin (5 parts) and xylol (1 part), heated to 37° C.[2] The tissue is then placed in hard paraffin, in which it becomes embedded.

The principal advantage of this method consists in the fact that any hardening of embedded embryonal tissue is thereby completely avoided. Consequently the cutting of the paraffin blocks is considerably facilitated. As is well known it is rather difficult to cut the eggs of frogs, as also the young frog embryos.

The pieces of the ripe ovary of *Rana esculenta,* having been fixed in dioxan as described above, cut as easily as blocks of pure paraffin; the same applies to the young frog embryos. It must be emphasized that all the histological stains hitherto tried (hematoxylin, eosin, Van Gieson's solution, etc.) have successfully colored tissues fixed in dioxan. In conclusion it is to be noted that the use of dioxan for fixing can facilitate many embryological sections.

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[3] Ordinary glass tubing or iron pipe one centimeter in outside diameter is recommended.

[1] H. Graupner and A. Weissberger, *Zool. Anz.*, 96: 204–207, 1931.

[2] F. P. McWhorter and E. Weier, *Stain Techn.*, 11: 107–117, 1936.

[3] H. Graupner and A. Weissberger, *Zool. Anz.*, 102: 39–44, 1933.

BOOKS RECEIVED

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