

PLASTINATION: TECHNICAL ADVICE IN THE PHASE OF FORCED IMPREGNATION

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INTRODUCTION

A special technique of preservation of biologic specimens called plastination has been used over several years at the Institute of Human Anatomy of the University "La Sapienza" of Rome.

This technique, discovered by Prof. Gunther von Hagens, consists of four phases: fixation, dehydration, forced impregnation and curing.

The stages of fixation and cure are always done at room temperature, while dehydration is at either room temperature using ethyl alcohol, or by freezing specimens (at -20°C), using acetone (dehydration freeze substitution with acetone). Forced impregnation, a technique at room temperature was used. Although subjected to the following technical problem: when acetone obtained from the anatomical specimens set in a vacuum-room (fig.1) reaches the lift pump and mixes with lubricating oil, changes its physical characteristics, causing structural damages to the mechanical elements of the pump. We eliminated the problem by means of a simple technical device called LIQUIFIED NITROGEN TRAP described as follows.

MATERIALS AND METHODS

Materials used: Thermically isolated cylindrical pierced lid (h=20cm; d=15cm). Thermical isolated cylindrical cover, abridgment (h=3cm; d=15cm). Graduated beuta (h=18cm; ability=500ml; base diameter=10cm). Double exit glass link. Rubber, elastic muff, Liquified nitrogen.

GENERAL SYSTEM

PREPARATION OF TRAP:

We interrupted the hydraulic circuit between the vacuum and the lift pump by interposing a double exit glass link, connected to a graduated beuta and a plastic muff, ensuring a perfect seal between the two faces.

Liquified nitrogen was poured into the thermically isolated cylindrical container filling two thirds of the container. The beuta, now inserted in the circuit, was placed in the thermic container. The latter was closed by a pierced lid then thermically isolated (the hole allows the linkage between the beuta and the hydraulic circuit).

This system permits keeping only the graduated beuta in the small refrigerated cell. After about twenty-four hours the

liquified nitrogen must be changed.

HOW THE TRAP WORKS:

The device, made up of the glass link and the graduated beuta, and connected in series to the circuit, was stored in the refrigerated cell; the acetone, drawn out of the vacuum chamber by the low (below the earth's atmosphere) pressure created by the pump, is brought into the beuta, then into an isolated system, whose inside temperature is noticeably lower than the surrounding temperature.

This process doesn't prevent the pump from continuing to create the negative pressure in the vacuum chamber, due to the presence of the double exit link.

CONCLUSION

The main advantage from using this technique lies in the possibility to that the process of forced impregnation at room temperature does not damage the pump. A further advantage is the possibility of withdrawing the pump and measuring the acetone obtained from the plastinated specimens whenever the liquified nitrogen is replaced. The forced impregnation procedure can be completely controlled.

SUMMARY

The Plastination laboratory at the Institute Human Anatomy of State University of Rome "La Sapienza" has developed a technical device which can be used during the phase of forced impregnation at room temperature. The device is very useful to the technique of plastination at room temperature. Thanks to this device, the mechanical structures involved in the phase of forced impregnation do not show morphological alteration of specimens.

REFERENCES

-von Hagens G.; Tiedeman K.; Kriz W, "The current potential of plastination". ANAT. EMBRYOL. 175:411-421, 1987.

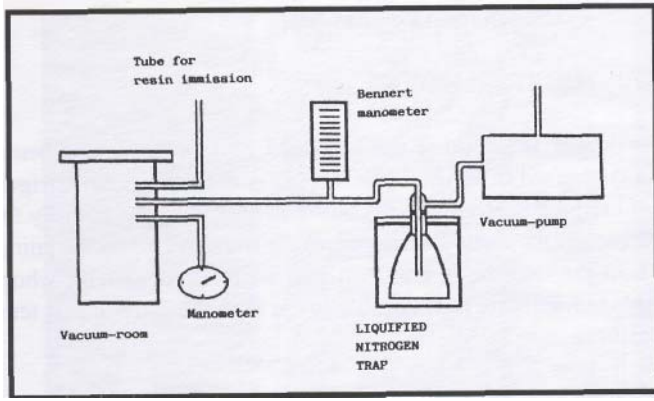


Fig. 1- Scheme of system in the phase of forced impregnation.

Photo 1- Vacuum-pump and Liquified Nitrogen Trap.
The outside of duble exit glass link is visible.

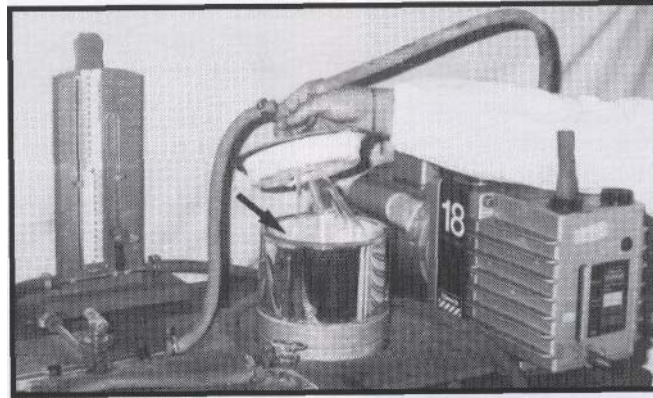
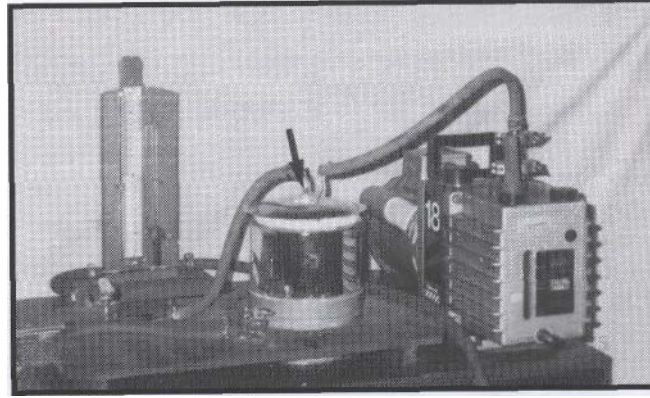


Photo 2- Inside the Liquified Nitrogen Trap. Note the graduated beuta and the double exit glass link