"PLASTIC EYES"

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UNTIL recently there has been no material available for the construction of artificial eyes other than glass. It is estimated that there are 300,000 wearers of glass eyes in Great Britain.

The fabrication of glass artificial eyes demands high skill, both in glass blowing and in estimating the contour of the eye cavity in which it will eventually rest. Only about eight families of artificial glass eye manufacturers reside in this country, and pre-war many thousands of glass eyes were imported annually from Germany. Since 1939 stock of glass eyes available in this country has been dwindling, and many opticians are finding difficulty in accurately matching and fitting the patient.

Two types of glass are used in this industry, soda-glass and lead-glass.

Where the latter is used, the life of the eye may be seriously curtailed as there is a tendency in some patients for the lacrymal secretions partially to dissolve the glass, and the usefulness of the eye may be limited to periods of from only 9 months to 2 years. When such solvency has occurred, there is a coarseness or pitting of the surface, which is disfiguring, and the glass also becomes intolerable in the socket.

Lead-glass eyes cannot be worn by all patients, as there may be some toxic effect by reason of partial solvency of the lead.

Soda-glass eyes are definitely more durable than lead glass eyes but are very fragile and the thin walls have been known to fracture in wear for no apparent reason. Severe changes in temperature, such as in moving out-doors in cold weather from a warm room, and dipping the eye in cold water while it is at room temperature, must be guarded against.

When a glass eye has been blown and contoured, it is sealed and cooled, and the hollow centre is then under reduced pressure. It may be that strains are set up, to be relieved later at some unfortunate occasion as before mentioned. Most artificial eyes will fracture on slight impact, and the utmost care is necessary in handling them.

Following the recent general introduction of acrylic resin dentures, the optical profession has become interested in this material for artificial eyes and considerable progress has already been made in this application.

Acrylic resin is a polymerised form of methyl methacrylate, is extremely light in weight and has a negligible water absorption.

It can be tinted, moulded in a plastic state in plaster of paris moulds from which wax patterns have been eliminated, and also possesses the properties of being easily trimmed to shape with a file and then polished.

Two research workers developed the "acrylic eye" independently, and arrived at a satisfactory eye by different channels.

Having now fitted a considerable number of these eyes, it is found that the permanency afforded the wearer makes them superior to glass eyes.

One technique incorporates a glass iris into an egg-shell white sclerotic, which is then tinted, veined, and the whole covered with a thin film of clear transparent acrylic resin.

The second system is similar except that a hand painted iris is utilised and incorporated in the acrylic eye between the coloured sclerotic and the transparent cornea.

In neither instance is there any substance other than acrylic resin exposed to lacrymal secretions. Patent specifications have been lodged covering both techniques.

Prior to the use of plastic material for the eyes, it had not been possible to make any trial of the eye in the socket before completion, but as an acrylic eye is made from an original wax pattern this can be inserted and altered, if necessary, to provide an extremely accurate fit before the permanent form is made. Bulk for bulk there is little difference in weight between glass and acrylic eyes. Under test, an acrylic eye has been dropped from a height of 30 feet on to a stone floor, several times without injury.

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BOOK NOTICES

The Surgery of Repair Injuries and Burns. By D. N. MATTHEWS, M.D., F.R.C.S. Pp. 386, with 198 figures. Blackwell Scientific Publications, Limited, Oxford. Price, 45/-

As stated in the preface, this book deals with the treatment of the common war injuries which come within the province of the plastic and maxillo-facial surgeon. It was written while the author was serving in the Royal Air Force, and almost all the clinical material on which it was based was composed of R.A.F. personnel.

A considerable amount of the letterpress deals with subjects which are outside the province of strict ophthalmology, but even this is of importance to those who have care of ophthalmic war injuries, since it includes sections on methods of skin grafting, formation of skin