receipt of stills for attachment thereto. Disinfectors complete with stills should not be requisitioned to replace them.

Since the portable disinfector itself is actually field equipment, this item is being assigned a new number in Class 9, which change will be published shortly. However, this shift in catalog position for the disinfector in no way alters the status or handling of the item with relation to the facts outlined.

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### ARMY DEVELOPS SUPERIOR ARTIFICIAL EYES

Artificial eyes are now being made of a plastic that can be tinted to duplicate every appearance of the natural eye, and in other ways they are superior to custom-made glass eyes. The artificial eye laboratory at Valley Forge General Hospital was the training center in which officers and enlisted men learned to create the new plastic eyes. The fitting of the artificial eye into the socket is done so well that considerable movement is possible, thus further avoiding an artificial appearance.

Major General Norman T. Kirk, The Surgeon General, credits three dental officers for the new development: Captain Stanley F. Erpf, Major Milton S. Wirtz, and Major Victor H. Dietz, who were working separately in England, Camp Crowder, Missouri, and Atlantic City, New Jersey. The Office of The Surgeon General had these men brought to Valley Forge General Hospital in order to pool their knowledge of plastics, science, and medicine, and esthetic aptitude, to found the artificial eye laboratory. Within six months they had perfected their techniques so that other men could be trained in thirty days to turn out the finished product. The three officers have now been assigned to other areas in the country, separately, so that each may continue experimentation and train still more technicians in this new art.

The construction of the new plastic eye is a step-by-step procedure which, when described in detail, seems complex, but each stage in the process is relatively simple. An additional advantage of the new plastic eyes is that they are practically indestructible. This is in sharp contrast to glass eyes which break easily if they are dropped. Plastic eyes can be bounced on the floor without injury. A custom-made glass eye may cost up to $300, depending on the reputation of the maker. The new plastic eyes can be made for less than $5 apiece and rival the custom-made jobs in quality.

Soldiers to be trained as technicians to make artificial eyes are eagerly sought in the Army. So far, the men who have worked out best are those who were dental technicians in civilian life.

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**Psychiatric Nursing Schools.**—As of 1 January 1945 psychiatric nursing schools were in operation in the First, Second, Fifth, Seventh, and Eighth Service Commands, and it is hoped to have schools operating in all service commands within the next few months.

# Prosthesis of the Eye in Synthetic Resin

## A Preliminary Report

CAPTAIN STANLEY F. ERPF
Dental Corps, Army of the United States
MAJOR VICTOR H. DIETZ
Dental Corps, Army of the United States
and
MAJOR MILTON S. WIRTZ
Dental Corps, Army of the United States

Fitting an artificial eye can be readily accomplished by the dental officer in cooperation with the medical officer. A simple, teachable method of fabrication is presented as a result of research conducted by the Medical Department of the U. S. Army, with the object of minimizing the usual period of delay experienced in procuring acceptable prostheses for military patients. Other advantages peculiar to the use of plastic for the fabrication of artificial eyes will be discussed.

### CONSIDERATION OF MATERIALS

There are definite disadvantages to the use of glass as a material in restorations of the conventional type. Glass restorations are fragile and are often broken even by the most careful patient. Not infrequently a glass prosthesis will explode spontaneously in the eye socket and will require the painstaking removal of the sharp fragments by the ophthalmologist. The surface glaze of glass is not permanent and etching often occurs. This becomes a source of annoyance to the patient. Glass restorations, also, are difficult to fit properly to defects and

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See War Department Circular No. 398, 10 October 1944, for partial list of designated U. S. Army general hospitals authorized to supply plastic artificial eyes.

The War Department has announced the award of the Legion of Merit to Major Victor H. Dietz, Major Milton S. Wirtz, and Captain Stanley F. Erpf (with Oak-Leaf Cluster) for work on plastic artificial eyes.

The three citations are practically the same, except that the original work of Major Dietz was done at Thomas M. England General Hospital, Atlantic City, and that of Major Wirtz, at Camp Crowder, Missouri. Because of lack of space, only one is published here.

CAPTAIN STANLEY F. ERPF, D. C.: For services from July 1943 to November 1944. Realizing the advantages that would result through the substitution of plastic for glass in the fabrication and fitting of artificial eyes he, while on duty in the European Theater of Operations, experimented with and produced a plastic eye that proved to be equal, and in certain types superior, to the custom-made glass eye. The resulting improvement in eye prostheses was so marked that other dental officers were immediately trained in the art and the method adopted for use in the theater hospitals. Returning to the United States in the spring of 1944, he was charged with the technical development of the plastic eye program. In cooperation with two other dental officers (Majors Dietz and Wirtz) who had individually experimented along similar lines, at Valley Forge General Hospital from 16 July to 1 November 1944, he perfected the technique, instructed a class of twelve dental officers in its application, and prepared a syllabus for teaching the method. Through his efforts, complete dependence upon a seriously depleted stock of artificial glass eyes no longer exists and superior eye prostheses have resulted.

variations in the soft tissues. All too often for this reason a stock glass artificial eye far too small will be selected for the socket it is intended to fit. Furthermore, the fabrication of an artificial eye in glass requires a degree of artistic talent and skill developed only by years of constant training and experience. Finally, stocks of glass eyes, because of curtailment of imports of critical components, are depleted to the point where military patients are no longer being supplied with restorations which can be considered optimum from a standpoint of fit, color, mobility, and alignment.

Restorations of a more durable substance were urgently required, which could be made as natural or more natural in appearance than those of glass. A material had to be used which could easily be procured and which would lend itself readily enough to routine technical procedures necessitating only the minimum of technical skill and laboratory equipment. A rapid, readily teachable method had to be devised which could be standardized to the point where the component parts of the prosthesis might be prefabricated, then assembled, modified, and adjusted to meet the patient's individual requirements. These requisites were of paramount importance to the military service in the present emergency.

The technique of fabricating plastic artificial eyes described has satisfied the foregoing requirements. Its advantages are concerned principally with the inherent strength of the material used and the ease with which an optimum result may be realized. The method has been kept as simple as possible in order that no extraordinary artistic talent or technical skill would be required. The procedures involved are well within the capabilities of the average dental technician.

The design of the prosthesis is such that it will permit fabrication in custom fashion with little more in the way of material and supply than those found in any modern well-equipped dental laboratory. The advantages of this feature as, for instances, in a theater of operations are obvious. On the other hand, where more elaborate facilities are available, stock production for emergency use may be accomplished, if desired, without difficulty.

The basic synthetic resin, methyl methacrylate, is easily obtained, being a standard item used in the production of acrylic teeth. It lends itself well to molding, coloring, and adjustment of size and shape after initial completion. Synthetic resin satisfies well the three factors important to the success of any prosthesis—namely, function, esthetics, and comfort.

## ANATOMICAL FACTORS

Preliminary inspection of the typical anophthalmic socket discloses a conjunctiva-covered posterior wall of more or less triangular outline. The posterior wall is surrounded by cul-de-sacs, or fornices, formed by the reflection of upper and lower lids. The most acute apex of the triangular outline is directed

toward the nasal aspect and resolves itself into the medial canthus. In this region is found a reddish elevation, the lacrimal caruncle. The next most acute apex of the triangle is directed superiorly. Between the two apices mentioned is a broad band, the retracted tendon of the superior oblique muscle which is found occupying the region of the fornix. The least prominent and most rounded apex of the triangle is found in the inferior lateral position.

The contour and motility of the posterior wall of the socket is influenced by several factors depending principally on (1) the type of operation performed by the ophthalmic surgeon—viz., enucleation or evisceration (exenteration), (2) whether or not an implant sphere was imbedded at the time of operation, (3) the type of implant sphere used, (4) the amount of orbital adipose tissue present, which incidentally varies considerably in certain individuals over a given period, and (5) the extent of atrophy of muscle and other tissue incident to the removal of the eye. Contour and tonus of the eyelids are particularly susceptible even to relatively slight injuries. These should be evaluated at the time of the examination of the patient.

With these essentials of anatomic configuration in mind, the technical aspects of the problem may be considered. They are divided for convenience into the following eight steps: the iris disc, the iris button, the impression techniques, the mold, the sclera, the veining technique, the conjunctiva, and polishing and fitting.

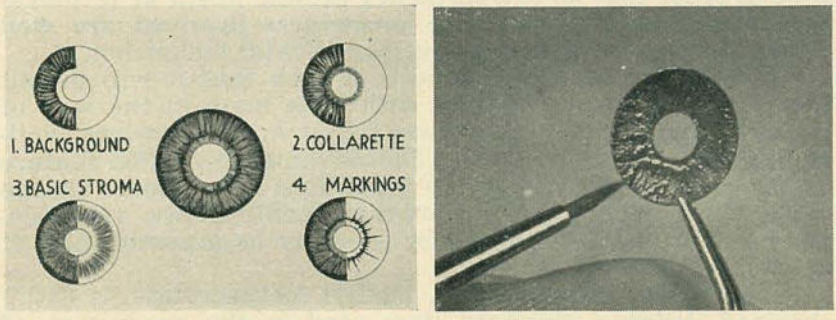


FIGURE 1. The iris disc.

1. *The iris disc.* Clear cellulose acetate, 0.01-inch thickness, is used for the painting of the iris disc. Perforated discs of four external diameters are used. The measurements of these are determined by the frequency range of iris diameters in the human eye—viz., 11.0 mm. to 12.5 mm. Diameters of the central perforation representing the pupillary aperture are varied at will by the operator. They may range from 2 mm. to 7 mm. or larger, the average being 4 mm.

The colors used for painting the iris disc are ordinary artist's oil pigments of high quality. Seven shades have been selected for their color permanency and are as follows: (1) zinc white, (2) ivory black, (3)

chromium green, (4) cobalt blue, (5) burnt umber, (6) yellow ochre, and (7) cadmium red.

Three or four zones of color are discernible in the average iris depending on its over-all color classification—i.e., blue, green, hazel, or brown (figure 1). The first and most peripheral zone of color is that occurring just within the corneoscleral junction. For identification it will be called the "background color." For practical purposes, it is the key to blending of the paints for subsequent procedures.

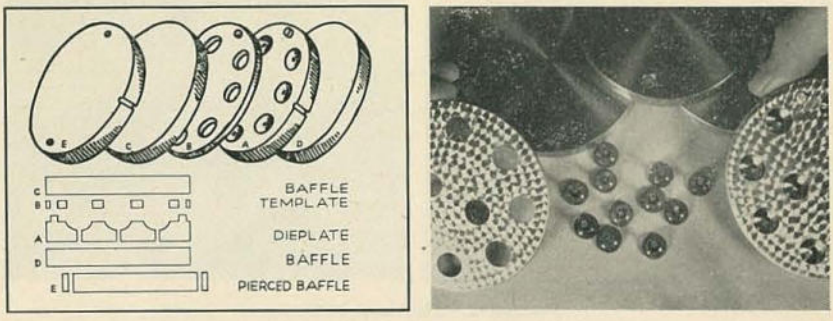


FIGURE 2. The die set.

The second zone of color occupies about one-half the radius of the disc and is found just within the zone background color described. It is a lighter color and can be usually matched by the simple addition of zinc white to the background color, the one exception to this rule being in the case of brown eyes when it is advisable to lighten by the addition of yellow. For identification it is referred to as the "stroma color" since its structure is radiating and striated in nature. The third zone of color is the "collarette color" which, with the exception of brown and hazel eyes, is found just within the stroma color. It can be matched with the addition of brown to the stroma color. Its radiating fibers are of considerably more delicate design. The fourth zone comprises that of the markings and assumes a variety of shades ranging from lemon-yellow to brown. Its designs, as in blue and green eyes, vary from small specks to a flame-shaped overlay covering half or more of the iris as in the case of brown or hazel eyes.

The paints are applied on both sides of tne transparent iris disc, in such a manner that the background and collarette colors painted on the underside will be discernible through the striations of the stroma color and markings painted on the obverse. This feature produces a true third-dimensional effect in the subsequent processing. Softness or harshness of striations is controlled by varying the consistency of the paint with linseed oil. After painting, the discs are placed for drying on a suitable rack (the small aluminum trays in which porcelain teeth are carded are excellent for this purpose). Drying is effected in a drying oven. Several hours at a temperature of not more than 55° C. are sufficient, provided that the paints have not been applied too thickly. Curing at higher temperatures will result in disc shrinkage.

2. *The iris button.* The die set for the processing of the iris button consists of five parts, namely: (a) die-plate, (b) template, (c and d) two baffles, (e) pierced baffle (figure 2). These are constructed of stainless steel and contain sectional cavities of varying sizes which permit the molding of the iris buttons. The iris button comprises four essential features—

viz., the iris disc, the pupil disc which is immediately behind the iris disc, the clear portion representing the anterior chamber and cornea, and the button stem. The advantages of the button stem are: (1) to act as an ejector-pin for removal of the button from the mold; (2) to act as a handle-pin for convenience in manipulating the wax form; (3) to serve as a device in determining correct alignment of the visual axis; (4) to serve as a locator for the button during molding and processing of the sclera.

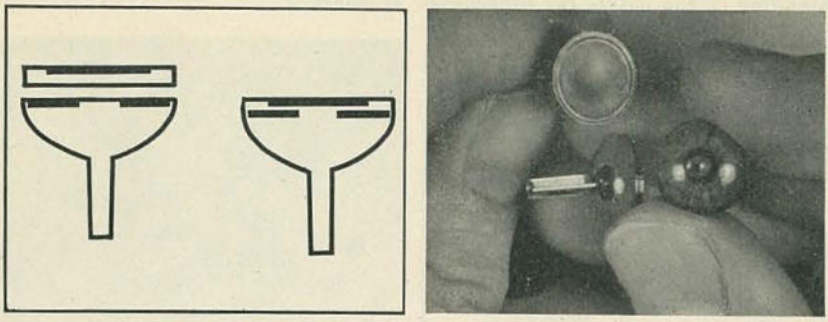

FIGURE 3. The iris button.

The advantages of the button *per se* are obvious in that prefabrication of an essential part is possible. The button can be made ready for immediate selection and use in the wax form on presentation of the patient. In spite of its simplicity it embodies such important features as the following: (1) A predetermined average corneal curvature and depth of anterior chamber which can be subsequently adjusted to meet individual requirements. (2) A means of producing the all-important diffused junction between the cornea and sclera and the opportunity of adjusting it to meet individual requirements. (3) A means of accurately selecting an iris of proper size and color without making allowance for the magnifying and intensifying effect of a subsequently placed clear plastic overlay.

Packing the die-plates: The die-plates are packed with a mixture of clear resin dough of rubbery consistency. The various essential elements of the die-plate are separated by intervening layers of dry cellophane to permit test-packing. All excess plastic is eliminated by test-packing and the flash material is removed by means of a suitable instrument. A jet black vinyl acetate pupil disc and the painted iris disc are then inserted in two stages and the die-plates reassembled and placed in a spring compress. After remaining under spring pressure for at least twenty minutes the press is tightened completely and the button allowed to cure in dry heat at 76° C. for at least three hours. After curing, the die is cooled and the buttons removed. It should be noted that the black pupil disc lies some distance posterior to the iris disc. This feature still further enhances the third-dimensional effect (figure 3).

3. *Impression techniques.* Stock artificial eyes when placed into sockets oblige the orbital tissues to conform to the prosthesis. Carefully made scleral forms individualized to the particular requirements of a given case reduce the possibility of distorting the tissues of the socket. If this factor is not observed, the maximum degree of mobility, so greatly desired in the artificial eye, is frequently lost.

An artificial eye with an ill-conforming periphery often causes the tissues and the fornices of the socket to be stretched into abnormal positions, thereby causing circumferential resorption and limiting mobility. Stock artificial eyes which are too loosely fitted lack adequate retention

and frequently will lag when the various ocular excursions are initiated. Such eyes produce their most notorious sequelae in the nature of shrinkage of the sockets with accompanying flaccidity of the orbicularis muscle and the orbital tissues. In either of the aforementioned cases the conventional concavity of the posterior surface of the stock eye may cause the prosthesis to teeter-totter over the fulcrum-like convexity produced by the implant-sphere. Noncontactual posterior surfaces may also impose an excessive stress upon the tissue-bearing areas of the periphery. The so-called "inevitable tissue changes" within the socket are frequently precipitated by those artificial eyes which are not physiologically and anatomically correct.

To our present knowledge the impression for the artificial eye should be taken within two or three weeks after the enucleation, as dictated by postoperative resolution. It is, of course, assumed that a plastic, modeling compound, or gutta-percha conformer will have been employed for a more effective centering of the implant-sphere in the socket during the interim between surgery and the taking of the impression.

Two alternate impression techniques are employed in developing a wax form which will determine the size and shape of the scleral portion of the artificial eye. The first, simpler, and more rapid of these is a "compression-impression technique" which is indicated in all cases where the socket to be fitted is not of grossly abnormal configuration, such as might be caused by cicatrices, extensive loss of contents of the socket, or injury to the structures of the eyelids. The second method is termed the "injection-impression technique." It is more circuitous in nature, and produces a no more effectively shaped prosthesis for the uncomplicated socket. It is advantageous, however, in those cases of extreme irregularity where retention of an adequate prosthesis constitutes a problem. The injection-impression technique is not recommended in the following instances: (1) In atony or flaccidity of the inferior lid. (2) In extremely small sockets, until peripheral distension has been adequately established in order to effect a retentive depth in both the superior and inferior fornices. Peripheral distension should be developed by the use of conformers of increasing size over a suitable period of time. (3) Where it is desired to employ a light-weight or shell-type prosthesis to minimize the weight factor which frequently causes sagging of the lower lid.

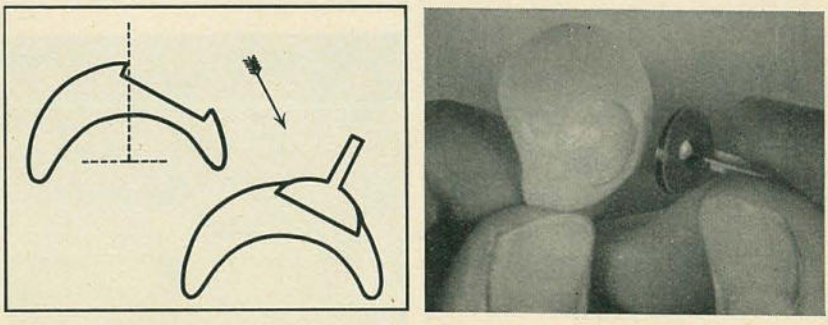

FIGURE 4. The wax pattern.

The compression-impression technique is as follows: A shallow cup is formed in medium hard paraffin wax, the convex surface of which should approximate that of the anterior aspect of the sclera of the eye to be duplicated. In most instances, this will be found to resemble closely

the curvature of a one-inch sphere, slightly compressed in vertical dimension, and slightly expanded horizontally. The wax cup is trimmed on its periphery to conform to the triangular outline of the posterior wall of the socket mentioned above under "Anatomical Factors." It should be observed that the edges of the prosthesis accommodated by the inferior and nasal fornices are of lesser thickness than those accommodated by the superior and temporal fornices. It is extremely important to relieve adequately the wax to compensate for the tendon of the superior oblique muscle which is found in the superior nasal position. Failure to observe this cardinal point will result in limited motion of the prosthesis in all directions, will result in tendency of the prosthesis to rotate in its socket, and will cause a sagging of the lower lid due to compensatory pressure. The posterior surface of the prosthesis is made concave, keeping in mind that too great a concavity will result in the production of a reservoir for socket secretions, and too little will result in limitation of movement. Ideally, the posterior wall of the socket should barely make contact with the prosthesis in this area. Experience has shown that optimum mobility is produced as a result. Additional relief to accommodate implant-spheres, if present, should also be made at this time.

When the wax pattern has been trimmed to the shape and size determined by observation of the landmarks mentioned, it may be tried in the socket. Being moldable at body temperature, the wax will partially conform itself *in situ*. Carving and finger-shaping, controlled by chilling of the wax in cold water, will assist in this connection. The center of the iris may then be marked in the wax with a suitable instrument. On removal, a circular recess (figure 4) is cut into the wax at the position marked for the reception of the iris button. The iris button is then seared in place. The wax pattern is tried again in the socket and such corrections are made as may be necessary to bring the iris into final position and alignment. Accommodation for the caruncle is also made so as not to suppress secretions from the lacrimal gland. Attention is then further directed toward refinement of the anatomical features already enumerated. A final check of alignment and mobility completes the compression-impression technique. It is obvious that universally-shaped blanks of wax, pre-molded with recess, and placed in stock ready for reception of the iris button and refinement of fitting, can be employed to facilitate this step of the procedure.

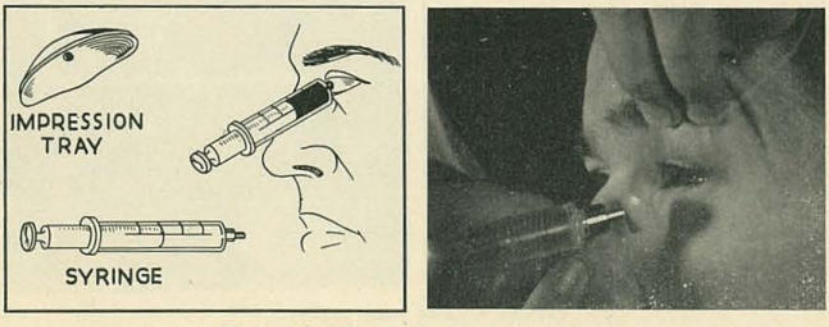


FIGURE 5. The injection impression.

The injection-impression is as follows: Alginate impression material is mixed of somewhat thinner consistency than that used for dental impression taking. The material is spatulated for approximately one minute;

the temperature of water used is preferably 70° to 80° F. Five cc. of the material placed within the syringe is sufficient for the socket of average size. The B-D Yale-lock type of Luer syringe (5 cc.) with the hub-lock removed is especially convenient to use.

With the patient looking straight ahead in distant vision, the hub of the syringe is placed within the palpebral fissure and the material is injected into the socket (figure 5). For convenience, a curved perforated impression tray of wax or plastic placed over the nozzle of the syringe may be used to establish normal contour to the upper and lower lids. Before the impression material has completely set, the syringe is withdrawn and after three minutes the impression is removed. It is immediately placed in the fixing solution which accompanies the alginate material. After remaining in this solution for at least fifteen minutes it is invested in stone as described below in the section on "The Molds."

From this mold a basic wax form must then be made which is altered in conformity with individual requirements. It must be remembered, however, since the injection-impression technique is the method of preference for use in malformed and mutilated sockets, that the anatomical landmarks described may be lost or obscured by the registration of various deformities. Attempt is made, of course, to produce a prosthesis of average shape, but frequently compromises must be made and one feature played against another, in order to accomplish an acceptable result. Herein lies the principal value of the method just described in that it copies perfectly such irregularities as must be dealt with in producing the optimum form for the deformed socket.

4. *The mold.* Artifical stone is recommended to give the mold the necessary hardness. The wax model should be flasked with its posterior surface toward the base. Care should be taken to avoid undercuts.

The stem of the button is then covered with petrolatum and the upper half of the flask is poured. After separation and removal of the wax, the iris button is carefully lifted out and the entire mold is tin-foiled. The iris button is then replaced and the mold is ready for packing of the sclera plastic. After packing, the sclera plastic is cured in either boiling water for one hour or in dry heat at 76° C. for three hours.

Should the injection-impression technique be used, it is necessary to form a wax pattern from a similar mold, omitting, of course, the extra steps involving the iris button. From this point on, the two techniques are identical. The wax is tailored by trial in the socket and the iris button imbedded.

5. *The sclera.* The colors of the sclera are manifold. Zinc oxide and titanium dioxide are most desirable opacifying agents and function, no less importantly, as whitening agents. The delicate grayish appearance of the sclera is affected by a balanced combination of zinc oxide and ivory-black powder pigment on the polymer granules.

The basic scleral shade is modified by the addition of minute amounts of pigment which function very subtly. The powder colors used for this purpose are five in number: brown, yellow, green, blue, and gray. With these, by formula, a scleral shade guide is composed of the shades mentioned. Various combinations may be produced by cross-blending or dilution with additions of the basic unpigmented shade. The correct scleral shade is selected by comparison with the actual basic color of the sclera as seen superior and inferior to the iris. Experience has shown that the most nearly universal shade is a combination of the green and yellow mixtures.

Assuming now, that the scleral portion has been processed around the iris button, the stem is removed and the anterior surface only of the

prosthesis is polished with pumice taking particular care to establish a proper corneoscleral junction, or limbus. If it should be desired to increase the apparent diameter of the iris or to decrease the depth of the anterior chamber, the limbus is polished back a little. More of the limbus is allowed to remain toward the medial canthus in order slightly to decenter the pupil in that direction, which is anatomically correct. The posterior surface of the prosthesis is allowed to remain unpolished in order that it may be relocated in the mold for processing of the conjunctiva. The restoration is now ready for the application of the veins.

6. *The veining technique.* For this purpose red rayon threads are employed. Having selected the proper color, a small sample of the fiber is separated into its monofils. By directly observing the degree of veining we follow the pattern of the veins as to their number and various diameters. The diameter of a single vein is increased by running two or more monofils together. Very realistic venous ramifications may be attained by adroit application. An alcohol-chloroform solution is used to tack the fibers into their different designs—i.e., straight, tortuous, sinuous, or any combination thereof (figure 6). The veins with which we are particularly concerned arise, essentially, from the direction of the medial and lateral canthi and terminate on reaching the limbus or before. Interrupted venous courses may be effected by breaking the continuity of the veins by cutting them in short lengths. In order to effect the structureless and delicate capillary beds red oil pigment may be delicately and sparingly applied. Similarly, oil colors of brown or yellow are applied by the finger tip in order to produce the characteristic surface pigmentations towards the medial and lateral canthi. A slight reddish tinge is also produced at the nasal aspect where occasionally this margin is visible during extreme lateral excursions. It is now ready for the application of the clear layer which is comparable to the conjunctiva.

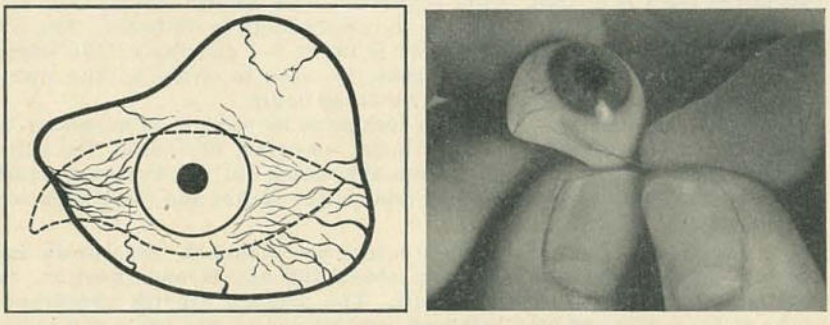

FIGURE 6. The blood vessels of the sclera.

7. *The conjunctiva.* The button stem which was deliberately removed during polishing of the sclera is reinserted into its proper position in the original mold. The mold is then re-tin-foiled. With the prosthesis now in position in the posterior half of the mold, a mixture of clear plastic dough is made and thinned out to wafer thickness. When its surfaces are no longer tacky to the touch, it is placed over the anterior surface of the prosthesis and the flask is then closed with spring pressure. Test-packing is seldom necessary. The case is cured at the usual temperature. Application of the clear plastic overlay representing the conjunctiva in this step must be carried forth carefully. The use of heavy closing pressure, or of resin dough which is not of proper consistency, may result in scrubbing off the applied veins and surface pigments or may craze the clear plastic

of the iris button. A monomer-polymer mixture has also been used successfully as a dipping solution to develop the overlay of plastic representing the conjunctiva.

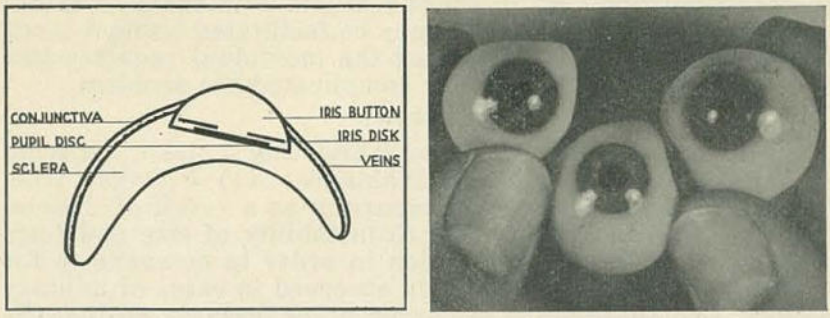


FIGURE 7. The finished prosthesis.

8. *Polishing and fitting.* Final polishing is effected with arbor chucks, pumice, tripoli, and polishing wax (figure 7). The prosthesis if carefully made will require only minor adjustment on insertion. Attention should be directed toward relief of possible impingement on the caruncle, toward obtaining proper alignment, and for producing contours on the corneal portion which must reflect high lights of identical number, size, and position with respect to the pupillary aperture when compared to the eye of the opposite side. This latter is extremely important, and the cosmetic success of the restoration greatly depends on it. Fine adjustment of peripheral contour should be carried out only after the patient has worn the eye for at least several hours, since some time is required for final equilibrium of tissues to be established after reception of the restoration.

Insertion is made with a drop of mineral oil and final instructions to the patient as the proper care of the prosthesis and the eye socket (see figure 8). It has been noted that many patients will wear prostheses for several weeks or months at a time without removal. Such well-fitted restorations when removed for inspection reveal sockets that are clean and with good tissue tonus. Although this practice is not recommended, it is felt that it speaks well for factors of comfort and compatibility of acrylic resin in contact with tissue over long periods.

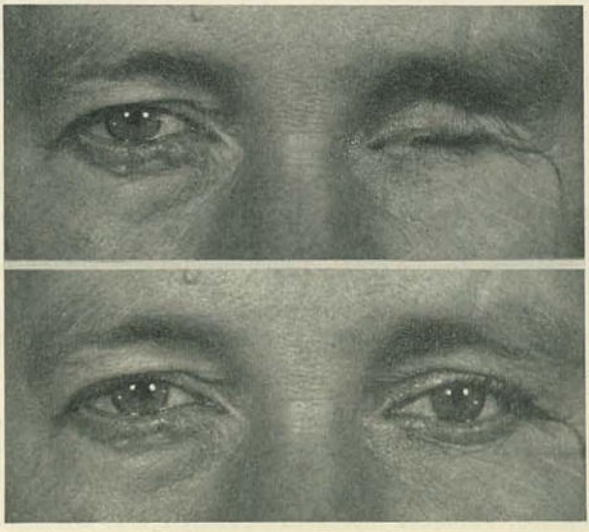

FIGURE 8. Patient before and after delivery of prosthesis, Dibble General Hospital.

The technique described is not to be considered in its final form at this time, as there are several aspects of this work yet to be investigated. These are principally concerned with still further reconciling custom-built features with those of standardization, so that fabrication may be facilitated without sacrificing the advantage of meeting the individual requirements of every patient no matter how complicated the problem.

SUMMARY

The technique described for fabricating a plastic artificial eye embodies the following advantages: (1) Freedom from fragility and surface etching occurring as a result of dissolution by socket secretions. (2) Adjustability of size and form during and following fabrication in order to compensate for socket irregularity so frequently observed in cases of military nature. (3) Adaptability of various other features, such as the limbus, depth of anterior chamber, diameter of iris, pupillary aperture, vascularity, and sclera color, to meet individual esthetic requirements. This is possibly only because of strictly anatomical assembly of parts throughout. (4) An actual three-dimensional effect in iris construction due to suspension in clear resin of a perforated transparent disc which has been painted on both sides. The three-dimensional effect mentioned is further enhanced by placement of the pupil disc at some distance posterior to the iris disc. (5) Opportunity to stock prefabricated iris buttons enabling the operator to know at the outset the exact color of the iris in the completed prosthesis. (6) Elimination of such time-consuming steps as multiple-mold construction, precision grinding of the iris recess, and engraving for simulation of veins as required in plastic prostheses of the conventional type. (7) Teachability of method insofar as dental personnel may be trained to undertake all phases of fabrication after a relatively short period of instruction.

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**Seminars at the Army Institute of Pathology.**—The following subjects were discussed at the weekly seminars at the Army Institute of Pathology, Washington, D. C.: "A Comparative Study of the Pathology of Scrub Typhus and Other Rickettsial Diseases," by Major Arthur C. Allen, M.C., 28 April 1945; "The Pathology of Trench Foot," by Captain N. B. Friedman, M.C., 5 May; "Experimental and Therapeutic Observations with Penicillin-Beeswax-Peanut Oil," by Captain Monroe J. Romansky, M.C., 12 May; and "The Similarity of Civil and War Injuries," by Dr. Harrison S. Martland, professor of forensic medicine, New York University College of Medicine, 19 May.

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**Monthly Medical Meeting.**—Major General Norman T. Kirk, The Surgeon General, presided at the regular monthly meeting of medical officers at the Army Medical Center, Washington, D. C., on 17 May. Brigadier General Charles R. Glenn presented additional opening remarks. Colonel John C. Flanagan discussed "Experimental Evaluation of Aircrew Selection Procedures"; Lieut. Colonel A. P. Gagge, "Human Factors and Aircraft Design"; and Colonel Russell V. Lee, "Use of DDT by the Air Corps."