Glass undines for eye irrigation

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These two undine ophthalmic irrigation devices (Fig) were donated to the Museum in 2005 by Dr FK Wong. Made by British surgical instrument specialist, Dixey Instruments, Ltd, the date of production is unknown. They were mostly used between the 1930s and the 1960s before single-use plastic disposable equivalents were available.[1] Although they have retired from use, they bore witness to a fascinating period of eye care and eye diseases in Hong Kong.

The term "undine" was commonly used to refer to these types of eye irrigation devices. One can easily understand by looking at the water droplet shape of the device that the name "undine" was inspired by the imaginary water elemental of ancient Greece. Undines appeared in the well-celebrated Swiss physician Paracelsus' (1493-1541) writings on alchemy. In classical literature, undines were mostly found in pools and around waterfalls in the forest. In ophthalmology, undines were used to pour cleaning liquid on the conjunctiva. These pear-shaped glass flasks are quite small: the large one measures about 8 cm in diameter, with a spout which is about 5 cm long; the small one is about 6 cm in diameter and spout about 4.5 cm long. There is one opening at the top of the spout and another collared opening for filling on the lateral side. While using the undine, the practitioner had to control the flow of liquid with a finger over the filling hole while carefully trickling liquid onto the patient's eye.

In 1953, as reported by the first consultant ophthalmologist in Hong Kong, British army colonel Dr GC Dansey-Browning, the most common eye disease was acute infection of the anterior segment of the globe (ophthalmia) related to malnutrition. Other diseases such as phlyctenular disease, syphilis, and trachoma were worsened by the living conditions of the poor people. For example, overcrowding in urban areas accelerated the spread of ophthalmia. Furthermore, compared with a Western diet including dairy, Cantonese foods such as congee contributed to the subnutritious conditions. An inadequate water supply was also a major factor

FIG. Two glass 'undine' ophthalmic irrigation devices. The larger undine is approximately 8 cm in diameter, with a 5-cm spout; the smaller one is about 6 cm in diameter with a 4.5-cm spout

that worsened the condition of trachoma in Hong Kong. In addition, infestations of parasites such as *Clonorchis sinensis* were common and could lead to phlyctenulosis. Syphilis was not an uncommon cause of blindness at that time.[2] Unfortunately, many doctors who treated these diseases were not qualified ophthalmological specialists but Eye-ENT practitioners. In 1957, The Medical Registration Ordinance regulated that "no person, unless he is a registered medical practitioner or is provisionally registered, shall hold himself out as being qualified, competent, or willing to undertake the treatment of diseases of the human eye or the prescription of remedies therefore."[3] Since then, ophthalmic services became standardised and began to proliferate.

Eye irrigation is a common procedure in the ophthalmic practice. It is useful for removing foreign material, debris, chemicals, or mucus from the surface of the eye or eye socket. In cases of emergency, irrigation is also important to minimise damage and potential loss of eyesight. To facilitate the rendering of appropriate first-aid treatment, or just to make irrigation quickly and conveniently performed, the design behind medical devices becomes crucial. Over time, novel designs of portable eye irrigation units became available, partially owing to the demand from industrial sites. For example, in Britain, irrigation was needed when irritant fumes injured the eyes of the personnel of mine rescue teams.[4] Despite striving for convenience, these devices used to consist of multiple parts that required tedious disassembling and reassembling.

Besides portability, material was also important. Undines made of glass are formed with integrated container and spout. In the late nineteenth century, glass became extensively used in science, but it was almost exclusively used in the field of physics. The wider application of glass, in chemistry for example, did not develop until the emergence of glassblowing technology, which was useful in producing ampules and vessels.[5] In the 1930s, the malleability of glass availed itself to become more extensively used for producing devices for storage, vials, and tubing. The creation of glass undine irrigation devices also kept up with the trend during this period.

As glass undines required laborious cleaning and sterilisation processes, new materials were gradually demanded. Scientists started to experiment with plastic materials in the late eighteenth century. However, it was not until plastic production techniques became more advanced and sophisticated in the mid-twentieth century that the new material began to dominate the healthcare market. In fact, one of the main reasons that ophthalmologists ceased using glass undines in the 1960s was because they could cause physical injuries to the eyes if not handled carefully. They were replaced first by devices with a cannula delivery system, connecting small plastic or metal tips. In the present day, plastic disposable undine equivalents are most popular because they are cheaper and easier to handle. Nowadays, discussion has again emerged regarding the environmental impacts of plastic and its potential substitutes.

References

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