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Wax models had been used for several centuries in Europe to depict anatomy of the human body; it appeared to have reached the peak of perfection in the 18<sup>th</sup> century especially in Italy. Rich collections of such models in cities like Bologna and Florence illustrate the high standards that were attained by collaboration between artistic modelers and leading anatomists of those days.<sup>[1]</sup>

This early wax modeling was known as 'Anatomica Plastica', where minute details of the human anatomy were depicted by wax models. The next logical step was illustration of diseases by use of wax models (Patho-anatomica plastica) and wax models (moulages) were used in various medical specialities like surgery, obstetrics, ophthalmology etc but it was in dermatology that these reached heights of artistic endeavor by faithfully reproducing the minutiae of skin diseases in a realistic three dimensional presentation that far surpassed any other teaching aids then available, like paintings, illustrations and photographs (Daguerreotypes) which were all two dimensional modalities. It is not surprising, therefore, that moulages soon formed the main teaching aids in dermatology and venereology till the 1940s, when the disruptions of World War II interrupted moulage production and good quality color photography became available and replaced moulages as the main teaching and recording medium for skin diseases.

The making of moulages (derived from the French, mouler, meaning to mould) in general includes preparation of a negative image of the patients own skin and then filling this image with molten wax to depict the exact appearance of the skin and the disease that it bears.

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The negative mould was usually made from the patient's skin using plaster of Paris which was then filled up with molten beeswax and other organic and inorganic ingredients which were kept secret by the moulager. The ready wax cast was then painted on with appropriate colors to approximate the color of the skin and the lesions of the disease. To impart authenticity, were often added real hair and glass eyes whenever necessary. The whole model was mounted on a wooden board and sometimes enclosed by a glass cylinder.

Because the skin is so readily accessible, this procedure could be repeated several times to capture various stages of the disease in the course of its evolution or devolution without much discomfort to the patients.

While the practice of anatomic wax model making was widespread all over Europe, moulages of skin diseases were restricted to few places and the techniques were zealously guarded by the moulagers who often refused to take assistants or share their knowledge of moulage making.

### THE BEGINNINGS OF DERMATO-VENEREOLOGIC MOULAGES

The creation of the first dermatologic moulages is credited to Franz Heinrich Martens (1778–1805) of Jena, Germany.<sup>[1]</sup> He studied and practiced medicine in the German city of Leipzig. As a physician and medical illustrator, he published in 1804 an Atlas of venereal diseases which contained a set of 24 pictures that he himself had etched in copper. Through the mediation of the famous German poet Goethe, he was appointed as a Professor at the University of Jena in 1804, where he started making venereological moulages until his untimely death a year later in 1805. It is estimated that about 32 moulages were made but in 1896 only 6 surviving Marten moulages were discovered in the Jena Anatomic Institute museum.<sup>[2]</sup>

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The true pioneer of making dermatologic moulages, however, is unarguably the Englishman Joseph Towne (1806–1879), who worked all his life as medical illustrator and moulager at Guy's Hospital, London. He is credited to have cast about 560 dermatologic and venereal moulages which captured accurately the nuances of the skin diseases that they set out to portray. To quote, "this series includes every known variety and many rare forms of skin diseases. The models are so lifelike that the student may imagine without the slightest effort that he is looking at the original".<sup>[3,4]</sup> Although Joseph Towne worked exclusively for Guy's hospital and refused to sell to any others in Britain, several of his moulages were sold abroad and found their way to collections in the USA, Russia and in India, to Calcutta, Bombay and Madras.<sup>[3,4]</sup>

A third wax modeler, also a physician, Anton Elfinger (1821–1864) was influenced by the renowned Viennese dermatologist Ferdinand Von Hebra to cast dermatologic moulages for the department at Vienna.

The beginning of dermatologic moulage collections thus developed independently in the early part of the 19<sup>th</sup> century, at different centers in Europe, namely, Towne in London, Martens in Jena and Elfinger at Vienna and paved the way for the rise of the dermatovenereologic moulage which half a century later would occupy centre stage and be accepted as a very effective model for teaching of dermatology and venereology to students of the subject.

Although Joseph Towne continued to produce moulages of a very high standard, his work had restricted reach, being used only in Guy's hospital and few collections abroad, mainly in the USA.

Dermatology in the first half of the 19<sup>th</sup> century, when Towne began his work on dermatovenereologic moulages, was just emerging as a distinct specialty of medicine and although departments of dermatology were started at various centers in Europe they all worked in isolation with no interaction between the dermatovenereologists of the different centers and hospitals. Towne's moulages therefore were unknown on the continent.

### **THE DERMATO-VENEREOLOGIC MOULAGE IN ITS HEYDAY**

The moulage passed from local use into international acceptance with the institutionalization of

dermatology and venereology and increase of scientific communication in the second half of the 19<sup>th</sup> century.<sup>[5]</sup>

As newer departments of dermatology and venereology were established all over Europe the number of dermato-venereologists increased and led to formation of national and international Dermatology Societies, which held conferences where ideas and scientific information were exchanged between the participants.

The 1<sup>st</sup> International Congress of Dermatology and Syphilology was held in Paris in 1889 in the hospital St. Louis and can be regarded as the era of flowering of the art of moulaging in Europe<sup>[5]</sup> as it exposed dermatovenereologists from all over the world to the vivid art of dermatovenereologic moulages.

Dermatologists were struck by the realistic three dimensional lifelike depiction of skin diseases that the moulage offered as well as by the artistic perfection that the moulager achieved in preserving for posterity the patient's skin disease for future inspection and study through the medium of wax models. It was easy for them to accept the moulage as a new teaching aid which easily surpassed the two dimensional depiction of the painting or etching that was then being used.

The Parisian tradition of moulage making started in the hospital St. Louis when the dermatologist Charles Lailler (1828–1898) introduced the dermatovenereologic moulage in the late 1860s. In 1864 Lailler met the artist Jules Baretta (1834–1923) who made his living by making realistic fruit imitations from papier mache. Lailler was so impressed with his skills that he requested him to attempt making dermatovenereologic moulages and the resulting work being very successful provided for a long and fruitful collaboration between physician and artist.<sup>[6]</sup>

Baretta, unlike Towne worked not only for the hospital St. Louis but offered his work to other hospitals and even private dermatologists and acquired a wider recognition than Joseph Towne ever did. At the time of his retirement in 1914, he had cast more than 2000 models for the St. Louis hospital and these moulages were properly catalogued and displayed in glass cases in the Anatomic museum of the hospital. It was in this hall, amongst the superbly cast models that Baretta had created that the International community of dermatovenereologists met for the 1<sup>st</sup> International Congress of

Dermatology and Syphilology, from August 5–10, 1889.

It is not surprising that the visiting dermatovenereologists were fascinated by the moulages which depicted realistically every lesion and dermatoses known to them and which spurred some of them to establish moulage collections at their own institutions in their home countries.

The moulage collection of the hospital St. Louis is the largest in the world and the total stock is estimated to exceed 4,000 dermato-venereologic moulages. This collection is still in use among students and physicians in Paris today.

The year 1889 and the 1<sup>st</sup> International Congress of Dermatology and Syphilology is therefore a historical watershed for the dermato-venereologic moulage which spread into the rest of Europe especially in Germany and the then Austria-Hungary empire, both countries already having well established centers of dermatology and venereology.

Although moulages had been made for almost half a century (1830s-1889), these were largely restricted to two centers namely, Guy's hospital in London (Joseph Towne) and the hospital St. Louis, Paris. (Jules Baretta).

The next half century, however, would see the spread of moulage making to almost every country of Europe and achieve a high level of acceptance amongst dermato-venereologists as an effective teaching aid for students of the subject.

As noted earlier, Alton Elfinger under the guidance of Ferdinand Von Hebra had started producing moulages in Vienna, however, the Vienna moulage tradition was firmly established by Moritz Kaposi (the son in law of Hebra), after his return from the 1<sup>st</sup> International Congress in Paris in 1889. He appointed Carl Henning (1860–1917), a physician and expert medical illustrator, to work exclusively on becoming a wax dermato-venereologic modeler.<sup>[7]</sup> Henning achieved rapid success and wide recognition for his work from the early 1890s and he presented in 1892 a series of much admired moulages on the occasion of the 2<sup>nd</sup> International Congress of Dermatology and Syphilology which was held in Vienna under the stewardship of Moritz Kaposi. Henning had a flourishing business in making of dermato-venereologic moulages which after his death in 1917, was taken over by his son Theodor

Henning. Together the Hennings, father and son dominated the moulage tradition in Vienna for more than half a century.

The Vienna collection today has more than 3000 dermatologic moulages and is the second largest in the world after the Parisian collection at the hospital St. Louis.

Paris and Vienna in the mid and late 19<sup>th</sup> century were leading centers for medical learning in Europe and it is not surprising that the largest moulage collections were established in those cities during the heyday of the dermatologic moulage.

### **SPREAD OF THE TRADITION OF DERMATO-VENEREOLOGIC MOULAGES TO THE GERMAN SPEAKING AREAS OF EUROPE AND BEYOND**

From 1890s onwards, apart from Vienna, many centres in the German speaking areas of Europe, several in Germany and Zurich in Switzerland had collections of moulages.

The extent to which moulage making flourished at a certain place<sup>[8]</sup> depended not only on the support of the medical or non-medical advisor, but also on the sources from where the moulages were obtained. Some hospital and universities could afford their own moulage making workshops (Ateliers), while others purchased their entire collections from private moulagers.<sup>[8]</sup>

Moulage collections were established at various centers in Germany.

In Breslau, Albert Neisser (1855–1916) developed a large collection of moulages, initially through purchases from Jules Baretta in Paris and Carl Henning in Vienna, but later appointed moulagers for the departmental workshop where Alfons Kroner (died 1937) became one of the most productive moulagers, having produced in his 40 year career about 2700 wax moulages.<sup>[8]</sup> 282 moulages still exist in Breslau, but the most have been dispersed elsewhere both due to the generous donations of Albert Neisser to help other centres as well as the destructive effects of the Second World War.

Albert Neisser's clinic was host to several students from all over Europe who came to study dermatology and venereology and were thus exposed to the art

of moulage making. Breslau therefore like Paris and Vienna before it became an important catalyst for promoting the art of moulaging in the German speaking regions.

In Freiburg the moulage was used as illustrative material for a dermatologic atlas by Eduard Jacobi (1862–1915)<sup>[9]</sup>

Fritz Kolbow, a private moulager in Berlin, was to play an important role in the future of the dermatovenereologic moulage. In Berlin he ran his private workshop for making of moulages, where, he, unlike his predecessors, accepted apprentices who took the art and techniques of moulage making to other places, namely Dresden in Germany and Zurich in Switzerland, where moulage making survived the general decline that set in after the Second World War.<sup>[8]</sup>

In Dresden, moulages survived because it developed as the centre of the German Hygiene movement and the moulages were considered as ideal models for educating the public in health education projects and to inform them about the ravages of venereal diseases, especially syphilis, of which a very high incidence was seen in the general population in the years after the First World War.

Kolbow produced the moulages for the First International Hygiene Exhibition that was held in Dresden in 1911. The establishment of the German Hygiene Museum in Dresden ensured that the dermatologic and venereologic moulages had a safe repository till as late as 1990.

Bruno Bloch (1883–1933), became the first Professor of dermatovenereology in 1916 at Zurich, Switzerland. He appointed in 1918, Lotte Volger (1883–1956) who had been taught the techniques of moulaging by Fritz Kolbow in Berlin, and who developed the dermatologic moulage collection of the University of Zurich. The collection grew in number and when due to retire in 1949, Volger took on two female students, who learnt the art of moulage making from her and continued Fritz Kolbow's tradition of the art.

Elsbeth Stoiber (born 1924) was the second of Volger's students who made two trips to India, the first in 1955 and the second in 1963-64 where she made several moulages of tropical diseases and leprosy.

The use of moulages continued till the 1960s in Zurich but gradually lost out to modern color photography as a medium of recording and teaching of clinical dermatovenereology.

The moulage collection is still in use in the Zurich University Hospital where the collection of over 1300 dermatovenereological moulages and more than 500 surgical moulages made by Adolf Fleischman are still being used by medical staff for the lectures and for exam preparation by students.<sup>[11]</sup> The moulage tradition in Zurich is characterized by its continuity and richness.<sup>[8]</sup>

Moulage-making has also spread to other parts of Europe notably to the Balkans and Greece. In Athens, the A Sygros Hospital was founded in 1910 as a dermatovenereological hospital where Professor George Photinos (1876-1958), its first director, built up a museum of wax moulages. Photinos was exposed to this technique both in Paris and especially in Germany where while at the clinic of Oskar Lassar, the moulager Heinrich Kasten must have had a great influence on him. The initial moulages of this collection are credited to have been made by Photinos himself. This collection still exists and is today the third largest collection after the collections in Paris and Vienna.<sup>[12]</sup>

## THE DECLINE OF THE DERMATO-VENEREOLOGIC MOULAGE

By 1970s, moulages had all but lost their pre-eminent position as teaching and visual aids to depict dermatologic and venereal diseases.

In Hannover, attempts were made to rescue this declining art by using modern materials for the casting of models. Friedel Hartje (1904–1971), long time moulageur to the Linden hospital for dermatovenereologic diseases in Hannover, experimented with modern plastics for casting of the models.<sup>[10]</sup> The models compared well with the earlier wax models and had flexible casts with true colors and the great advantage that many copies could be made from a single negative.

However, the decline of the moulage could not be prevented and gradually the moulage lost its appeal as a teaching aid in dermatovenereology. The art of moulaging and the moulageur disappeared.

From the 1980s, however, an interesting trend has developed since the discovery of the dermatologic moulage by medical historians and several papers have appeared in dermatology journals describing moulage collections at various places throughout the world.<sup>[12-15]</sup> Historians and clinicians are discovering collections of moulages, long forgotten, now considered historical treasures, and attempts are being made to resurrect these collections and put them on display.

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