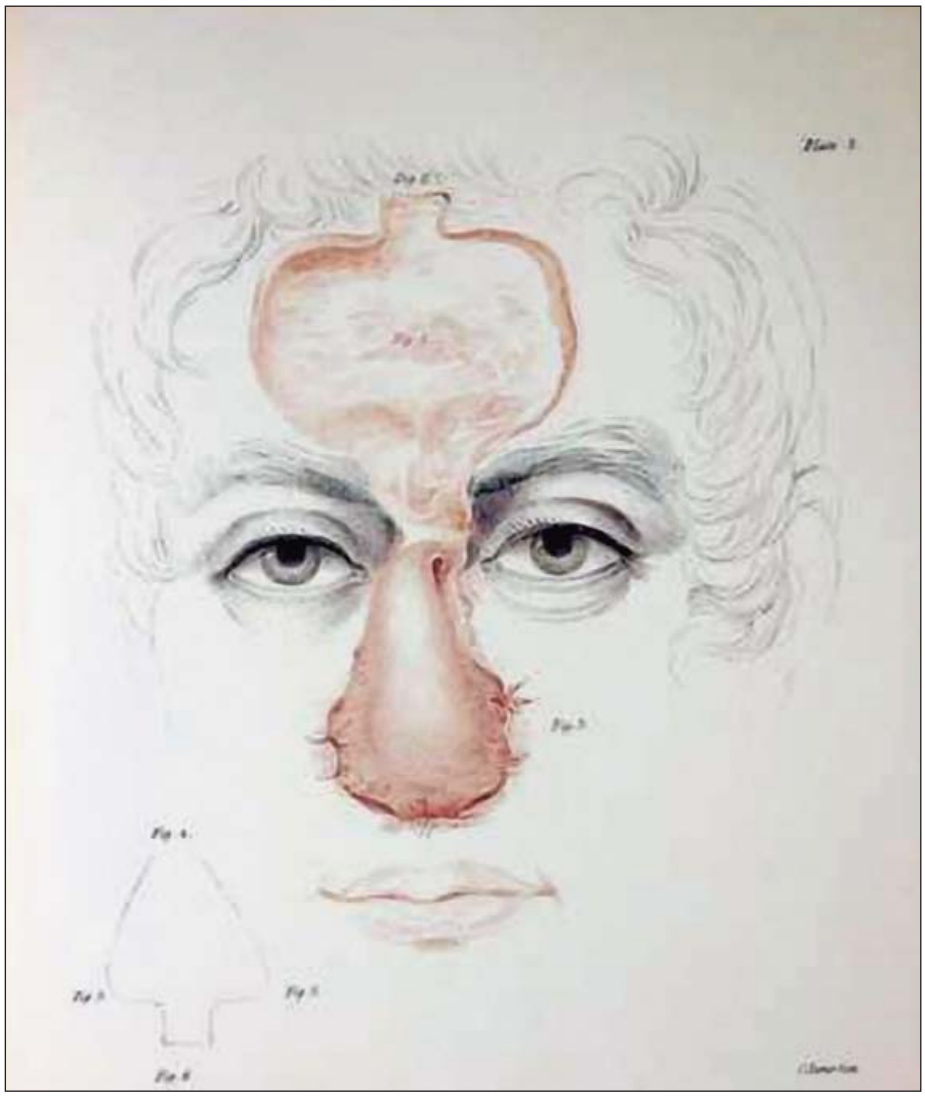

Joseph Constantine Carpue : An Account of Two Successful Operations for Restoring a Lost Nose from the Integuments of the Forehead (1816).

Hist Otorhinolaryngol 2016;1:84-98

Jacques Joseph's Original Instrument Collection

by

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Abstract
Jacques Joseph (1865-1934) from Berlin, the founder of modern nasal surgery and pioneer of facial plastic surgery, developed or modified all the instruments for his innovative techniques of reconstructive and aesthetic facial operations more than 100 years ago. They were fabricated by Pfau company in Berlin and recognizable by the engraving "*PROF. JOSEPH*". Between the two World Wars many surgeons from abroad learnt as Joseph's students and close colleagues in the Charité Hospital or in his private praxis. Most of these plastic surgeons had to emigrate during the Nazi era and cared for his original instruments like religious relics. Starting 1969, Professor Rudolf Stellmach, himself a world-famous facial plastic surgeon in Berlin, assembled numerous of Joseph's original instruments in a collection. Since 2007, thanks to Mrs. Stellmach's generosity, these original instruments have been on display at the Berlin Medical History Museum of the Charité. The following report tries to enable a short glimpse into this unique instrument collection of our outstanding teacher Jacques Joseph.

Key words
nasal instruments, Jacques Joseph, historical collection, rhinoplasty, plastic surgery

Introduction

All traumatic surgical techniques via increasingly smaller openings require finer and more precise instruments. In addition to the size and shape of the instruments, the physical properties of the material and its degree of hardness, e.g. of scissor blades, are important aspects. Historical collections of original instruments used by great surgeons reflect the technical state of the art of instrument design and construction, but also shed light on the surgical techniques for which they were developed.

Instrument collections are contemporary documents of medical history, and therefore plainly significant for cultural history, because they show how surgery literally invaded the lives of people: what traumas, what risks or how long hospital sojourns were in conjunction with the operations of that epoch.

It is particularly fascinating when such a collection like Joseph's set of instruments comes about through the efforts of a prominent protagonist of a young specialty, who assembled it in a detective-like search for unique pieces scattered all over the world. Thus, behind the collection and each and every instrument there is often a very personal story[1].

Jacques Joseph's life and his surgical instruments

All his life, Professor Jacques Joseph (1865-1934) (fig. 1, see p.86), the founder of modern nasal surgery and pioneer of facial plastic surgery, developed new instruments or

*Karl Storz Company, Tuttlingen/Germany

Fig. 1
Joseph performing a rhinoplasty operation in Berlin. The instrument table at the left.

modified and improved instruments for his innovative techniques of reconstructive and aesthetic facial operations[3-8]

World famous is the so-called "*Joseph*", a periosteal elevator named after him, that is still in demand in operating rooms the world over. Joseph had every instrument developed by him engraved with a small inscription: "PROF. JOSEPH" (fig. 2).

Fig. 2
Original Joseph's instrument with typical inscription.

Joseph's career began in the Germany of Kaiser Wilhelm and earned him the highest professional acclaim and social reputation during the years of the Weimar Republic. Joseph always lived in Berlin and also was buried here. He had a private praxis until 1916, when the Prussian Ministry of Education and Cultural Affairs appointed him the head of the newly formed Department of Facial Plastic Surgery at Berlin Charité Hospital.

Fig. 3 shows (page opposite) a historical photograph of the operating theater at the Charité Hospital at about the time when Joseph was in charge of the Department of Plastic Facial Surgery. A surgical team, wearing white hygienic cloaks, is crowded around the operating table. The age of asepsis and antisepsis had just begun. Diffuse daylight illuminates the operating field. A tiltable mirror with a rope pull illuminates the operating table. In the foreground are a well-equipped instrument table, the Schimmelbusch drums with sterile instruments, sponges and drapes, and auxiliary tables with disinfectant solutions.[9]

Joseph's department in the Ear and Nose Clinic was active from 1916 to 1922. 1919 he was granted the title of Professor by the Ministry of Science, Art and Culture. When the Army stopped financing the Department of Facial Plastic Surgery in 1922, Joseph returned to his private practice at 63 Kurfürstendamm and devoted himself increasingly to corrective and aesthetic surgery. He gave surgical courses at a local hospital at Bülowstrasse and taught dissection classes at the Department of Anatomy at Charité Hospital (fig. 4 opposite page).

Fig. 3
Photograph of the operating theater at the Charité Hospital when Joseph was in charge of the department of plastic facial surgery (1916–1922). [9]

Even during his lifetime, Joseph was a Berlin legend and was known as Nasen Joseph („Nose Joseph“) or „Noseph“ in Berlin [10]. Unimaginably that Joseph ended under the National Socialists with humiliation and blacklisting during the systematic persecution of the Jews.

During the Nazi era, many of Joseph's students and close colleagues emigrated. The original instruments were scattered all over the world and cared for like religious relics by renowned plastic surgeons. In 1969, Professor Rudolf Stellmach (1924–2003) was given a few of Professor Joseph's original instruments by the widow of Dr. Pabst, who had practiced plastic surgery in Berlin-Grunewald. It is particular accomplishment of Professor Stellmach – himself a world-famous facial plastic surgeon, specialized in repair of facial clefts – that he assembled numerous original instruments in a collection (fig. 5, p.88).

Fig. 4
Surgical course in rhinoplasty. Professor Joseph (sitting behind the patient), surrounded by course participants from all over the world, ca. 1921[10]

Stellmach's international reputation and scientific travel activities were the fortunate precondition for Joseph's students, mean-while famous in their own right, e.g., Gustave Aufricht (1894-1980), Joseph Safian (1886-1983), Samuel John Fomon (1887-1971), or Jacques Maliniac (1889-1976), and leading plastic surgeons of the day, such as John Marquis Converse (1910-1981), to give him their “mementos.”

At many courses given in the United States, Samuel John Fomon taught the rhinoplasty techniques he had seen performed by Professor Joseph in 1930; among his students were Maurice Cottle (1898-1981) of Chicago und Irving Goldman (1898-1975) of New York. After 1922, Aufricht und Safian worked together in Joseph's practice, having

Fig. 5
The collection of original instruments of Jacques Joseph, assembled by Professor Rudolf Stellmach. (authors)

Top row, from left to right
1-5 Joseph knives, double-edged, in various sizes
6 Joseph surgical knife, small size, ball end
7 Joseph rhinoplasty scissors, straight
8 Joseph rhinoplasty scissors, curved
9 –bl Joseph clamp, slightly curved, blunt
bm-bn Joseph shielded saw guide, bayonet-shaped, in two sizes
bo Joseph swivel knife, bayonet-shaped
bp Joseph periosteal elevator
bq Joseph septum chisel
br Joseph osteoclast
Bottom row, from left to right
bs-bt Joseph nasal saw, bayonet-shaped
bu-cl Joseph nasal rasp, angular
cm-cn Ivory holding forceps
co Cotton carrier, probe
cp Joseph punch for nasal tip cartilage
cq-cr Joseph draw knife, single-edged, angular
cs Joseph metal rod, angular (authors)

previously passed an internship there (Aufricht for nearly two years and Safian for a few months). There is an impressive report by Safian on Joseph's teaching sessions, which took place in the operating theaters of the various hospitals in which he treated his patients.

"*There were usually four or five other observers, none of them Americans during my stay. All wore their street clothes in the operating room. Professor Joseph did not permit questions to be asked during the operation. His usual answer was, 'Sie stören den Patienten, - später.' ('You are disturbing the patient, - later.'). When he was through operating, he was always in a hurry to get away on some pretext. It was quite evident that he was not too anxious actually to teach. The observers usually carried on a discussion in German, each giving his impression of what had been done. Professor Joseph never participated in these conversations. At the end of my first ten-day course, I was disappointed at the little knowledge I had gained.*" [10]

Among those who did not want to leave without achieving their goal were Aufricht and Safian. For their persistence, diligence, and open admiration for Joseph's ability, they were rewarded with their master's trust, even his affection, so that with them he broke his usual reserve and apparent coldness. For them he became a caring, patient teacher, even accepting and realizing

some of their suggestions, such as holding a surgical course on a cadaver. Later, both of them emigrated to America, settling in New York. Joseph remained their friend until his death.

Aufricht published a great deal and became one of the best-known rhino-surgeons in the USA.

After a period of study with Joseph, Jacques Maliniac, a military surgeon from Poland, also tried his luck in New York. In 1931, together with Gustave Aufricht, he founded the *American Society of Plastic and Reconstructive Surgeons*.

Thus, most of the original instruments were to be found in the United States, and returned to Berlin with this collection. Since 2007, thanks to Mrs. Stellmach's kind generosity, the instruments have been on display at the Berlin Medical History Museum of the Charité as part of its permanent collection *‚Dem Leben auf der Spur'* (‚On Life's Trail').

Like the instruments, Joseph's personality and significance were largely forgotten in Germany, even after the end of the Nazi era and awareness of his legacy in the minds of his specialty colleagues had to be rekindled. Stellmach's collection of highly varied original instruments is also revealing of another aspect: the inseparable duality between surgical mastery and constant striving for improvement of the required instruments. To illustrate this, a few innovative surgical steps and the instruments developed for their performance are described.

Intranasal Approaches: Nasal Hump Removal (Rhinokyphectomy)

In 1898, Joseph performed the first plastic operation for reduction of nasal size using an external approach[11] More than 100 years ago, in 1904, he presented the first report on simultaneous intranasal removal of a nasal hump and the anterior septum[12].

Joseph systematically worked up this approach for various indications in the years that followed. At that time, intranasal surgical techniques were considered complex, unsurgical und highly susceptible to infection.

Fig. 6
For intranasal removal of humps, narrowing of the bony nose or correction of a deviated nose Joseph used
1 Joseph surgical knife, double-edged, in various sizes
2 Joseph rhinoplasty scissors, straight
3 Joseph rhinoplasty scissors, curved
4 Joseph shielded saw guide, bayonet-shaped, in two sizes;
the following instruments, the originals of which are contained in the collection:
5 Joseph periosteal elevator
6 Joseph septum chisel
7 Joseph nasal saw, bayonet-shaped
8 Joseph nasal rasp, angular. (authors)

Fig. 7
Intranasal intercartilaginous incision with the double-convex Joseph scalpel.

Fig. 9
Intranasal removal of a hump with a saw.

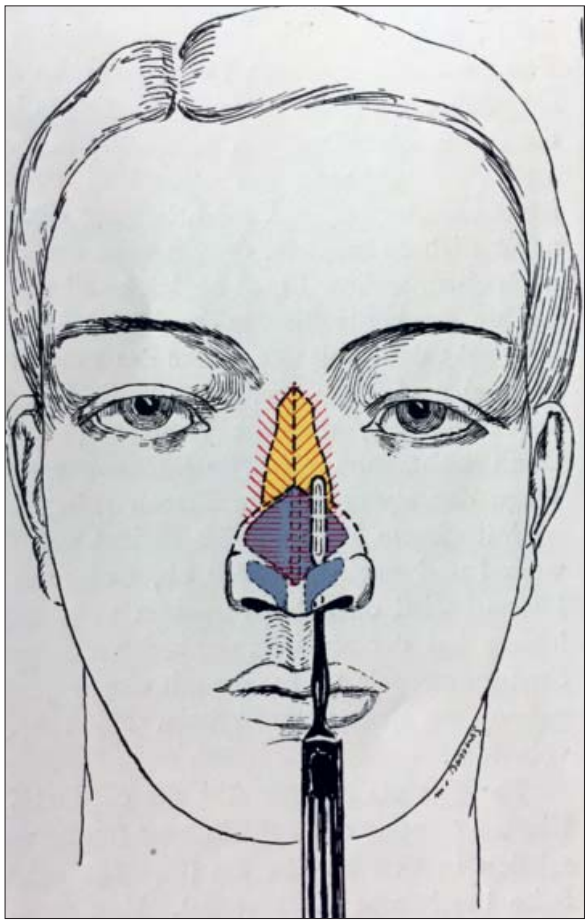

Fig. 8
Intranasal subcutaneous insertion of the nasal rasp.

By the time World War I began, Professor Jacques Joseph had a well-earned reputation, both among specialist colleagues and medical lay people as the most prominent German facial surgeon.[13]

For the removal of nasal humps, Joseph used saws. Detachment of the cutis was performed by making a precise stab incision with a double-convex scalpel as far as the piriform aperture (fig. 6, instrument 1). Then the periosteum was elevated using a raspatory (fig. 6, instrument 5). This instrument served to guide the saw and position it securely, while protecting the surrounding tissue, the superficial musculo-aponeurotic system.

"The removal of the hump proceeds in two stages: 1. intranasal separation of the skin and the periosteum, and 2. the actual sawing. It is performed by me in the following manner using the intranasal approach …"

"Using a surgical knife that has been introduced through the nostril, the surgeon makes a mucosal incision just above the pos-

Fig. 10
Lateral incision with the double-edged Joseph scalpel.

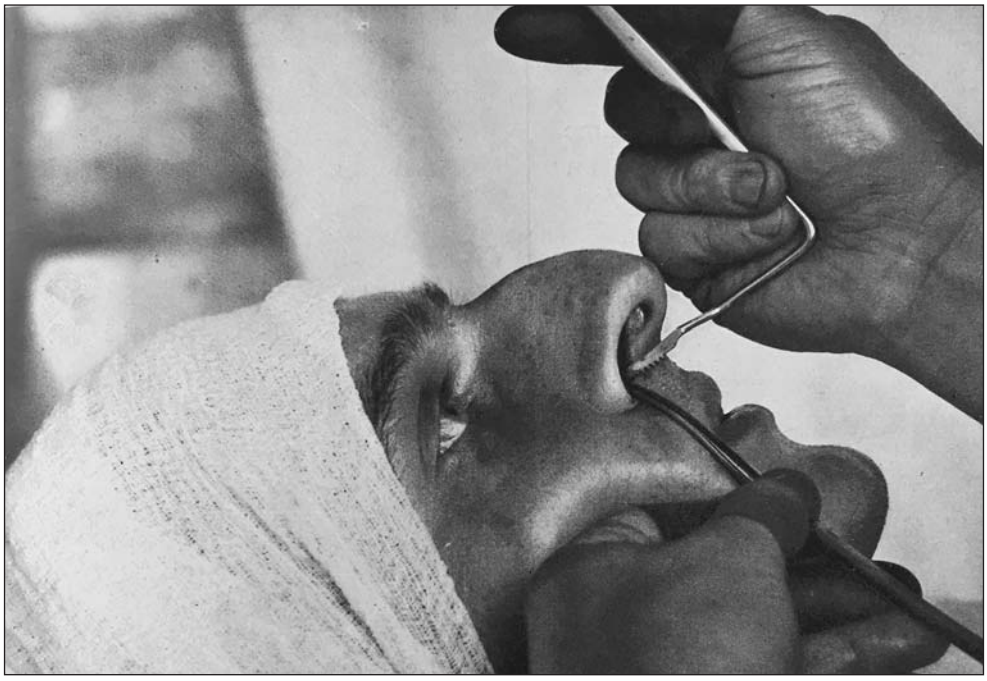

Fig. 11
Insertion of the shielded saw guide.

terior edge of the triangular cartilage (fig. 7, page 89). Then he introduces the tip of the surgical knife between the triangular or lateral cartilage toward the front, in order to reach the lateral surface of the nasal bone; once there, he transsects the periosteum and elevates it gently. With the raspatory, which bends around the surface, the periosteum can be separated from the bony hump upwards (fig. 8 below) to the nasal base and far enough laterally to provide sufficient space for the saw (fig. 6, p.89 instrument 7), which is applied from the side."[2]; (fig. 9, p.90)[2]

"If the nasal dorsum has not become too wide due to removal of the hump, the operation is finished. If the dorsum is too wide, the morphological deficiency must be repaired in the same session by narrowing the bony nose (Rhinosyspasis). ...To this end, the double-edged straight scalpel is used to make an incision in the lateral recess of the nasal vestibule, just inferior to the nasolabial fold and deep enough for the tip to reach the outer surface of the maxilla (fig. 10, p.91). It is much easier to introduce the lateral saw if one does as I do regularly, i.e. first insert a "guide", a hook-shaped instrument with its end hollowed into a trough, through the incision in the vestibule, and introducing the saw alongside it." [2] (fig. 11, p.91).

The fact that Joseph used the sawing technique might be explained by his orthopedic training with Professor Julius Wolff (1836–1902) at a time when saws were much in use. "*After preliminary exposure of the nasal bone and the triangular cartilage, one can proceed to the actual removal of the hump. This can be done in various ways: with a saw, with a chisel, with a drill, or with the bone forceps. There is still a world-wide controversy as to which instrument is most suitable. Again and again there are reports on the advantages of one instrument over the others. In earlier times, according to Eitner, sharp spoons and punches were also used to remove the hump (Lexer and Balsinger). Lexer employed an obsolete method of hump removal using a Luer forceps inserted from the outside via a median incision on the nasal dorsum. French pioneers of plastic surgery preferred the chisel, whereas Joseph, Lindemann, Roy, Eitner, Frühwald and others introduced the use of a saw. … In the last analysis, it is more important that the surgeon has a good command of one of the instruments. Safian in 1955 emphasized the advantages of the Joseph saw over the chisel. The saw is supposed to be faster and more precise, and the line of resection straighter.*"[14]

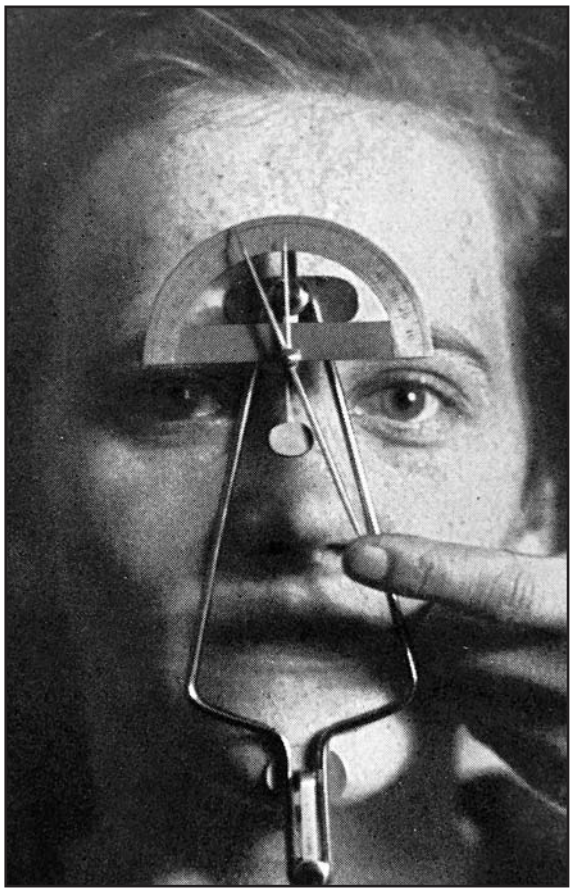

Fig. 12
Joseph's Rhinoscoliometer [2].

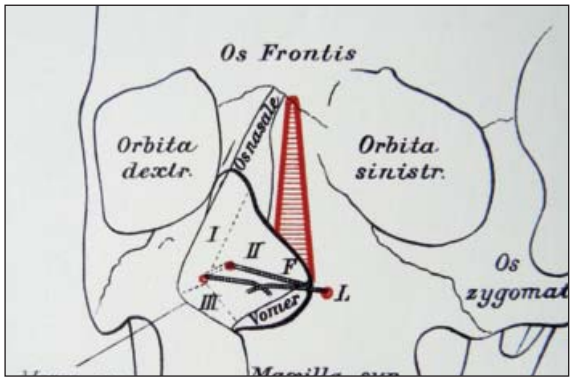

Fig. 13[2]
Drawing of the technique of wedge resection

At that time, various chisels for ear, nasal septum, and sinus surgery, such as those from Thies, West, Freer or Brünings, were already available in sufficient degrees of hardness.

Fig. 14
Rhinoclast and hammer.

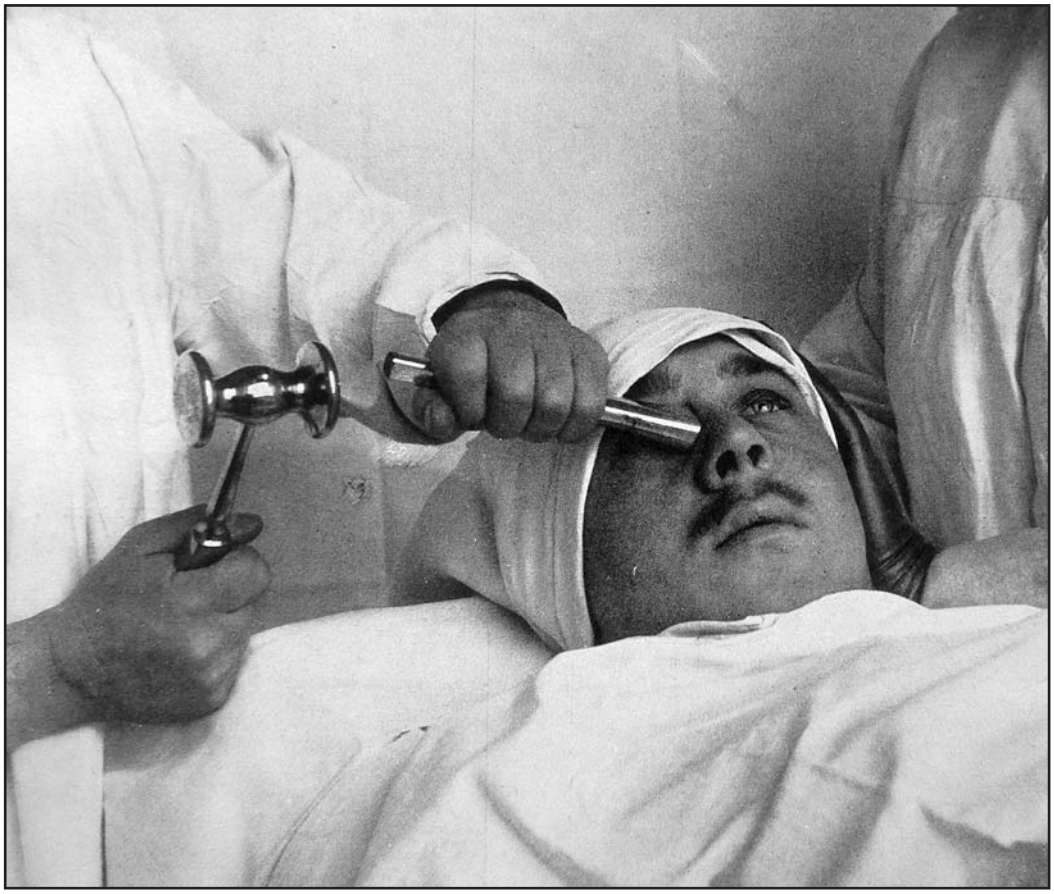

Fig. 15
Application of the rhinoclast.[2]

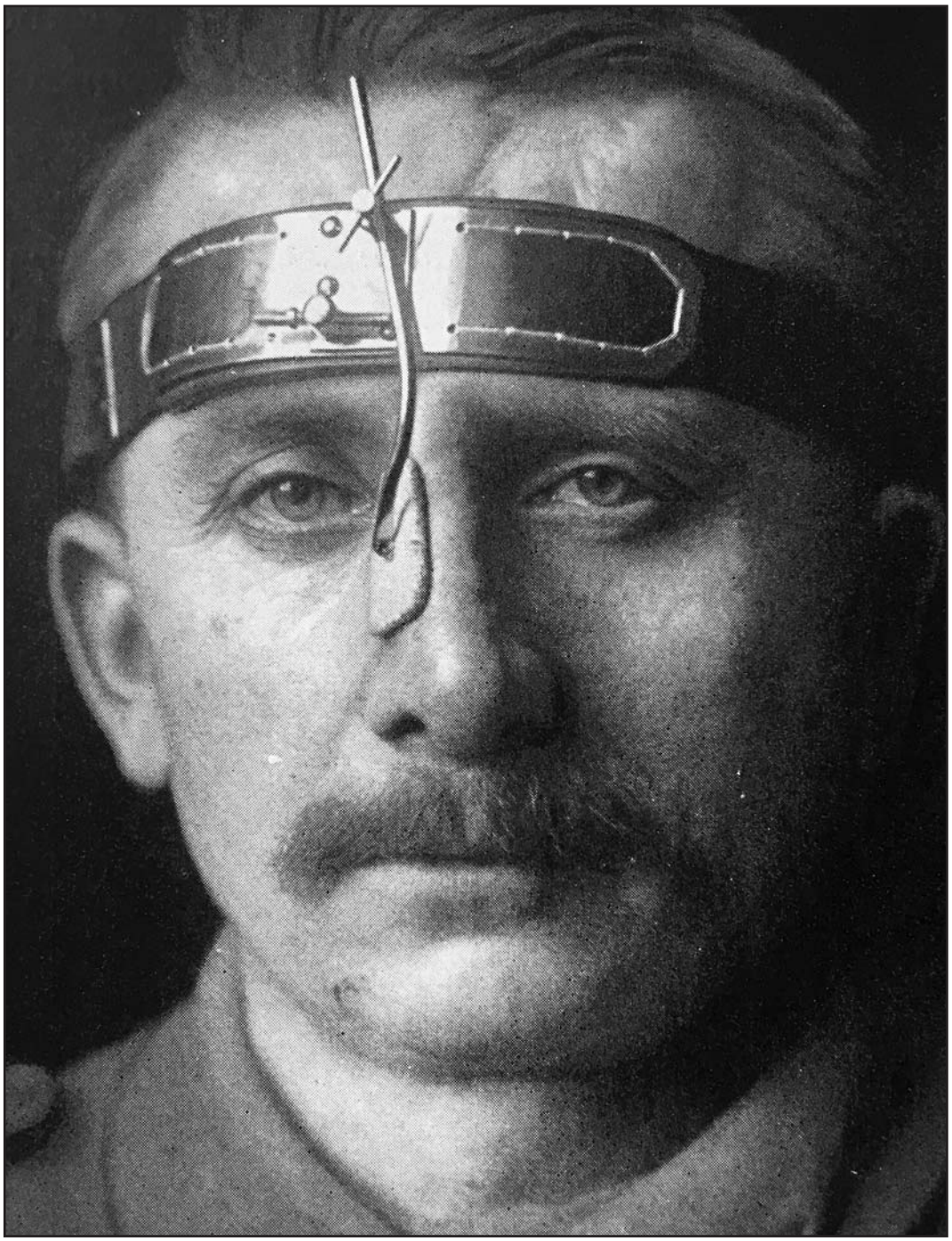

Fig. 16[2]
Joseph nose-straightening retainer

Realignment of a Crooked Nose (Nasal Orthoplasty)

For measurement of the lateral deviation of the nasal dorsum from the midline, Joseph used a special instrument he designed himself, the so-called rhinoscoliometer (fig. 12, p.92).

Joseph also introduced the technique of resecting a wedge of maxillary bone to achieve symmetry of the nasal pyramid[15]. His fig.13[2] explained the procedure in a sketch.

"*Joseph intranasally resected a wedge-shaped piece of bone from the maxilla, from the broader side of the crooked nose,*

Fig. 17
Joseph punch for nasal tip cartilage.

Fig. 18[2]
Intranasal excision of a strip of alar cartilage by Joseph's method.

while resecting the opposite side in a line. This wedge resection from the broader side of the bony crooked nose provides space for it to shift toward the midline of the face, facilitating repositioning."[2]
Repositioning of the nose was performed manually or by a few taps with the Joseph rhinoclast (fig. 14, 15 p.93).
After the operation the patient had to wear a retainer designed by Joseph to maintain the position of the nose (fig. 16).

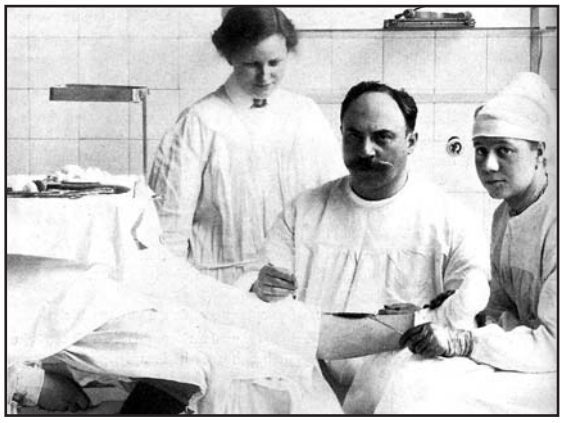

Fig. 19[2]
Joseph during tibial bone graft harvesting prior to rhinoplasty.

Correction of the Nasal Tip

For narrowing a broad nasal tip, Joseph developed various methods. The Joseph punch shown in fig. 17 served to excise a strip from the alar cartilage via the intranasal approach (fig. 18).

"With this method, one must distinguish an immediate and a long-term effect. The immediate effect is that the nasal tip is drawn back a bit and is initially somewhat narrower, without the nasal wings being pulled together to any extent. The long-term effect of the method consists of the nasal wings

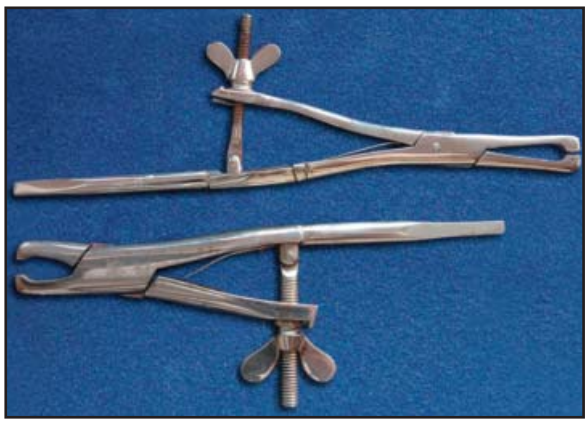

Fig. 20
Ivory holding forceps for preparation of grafts.

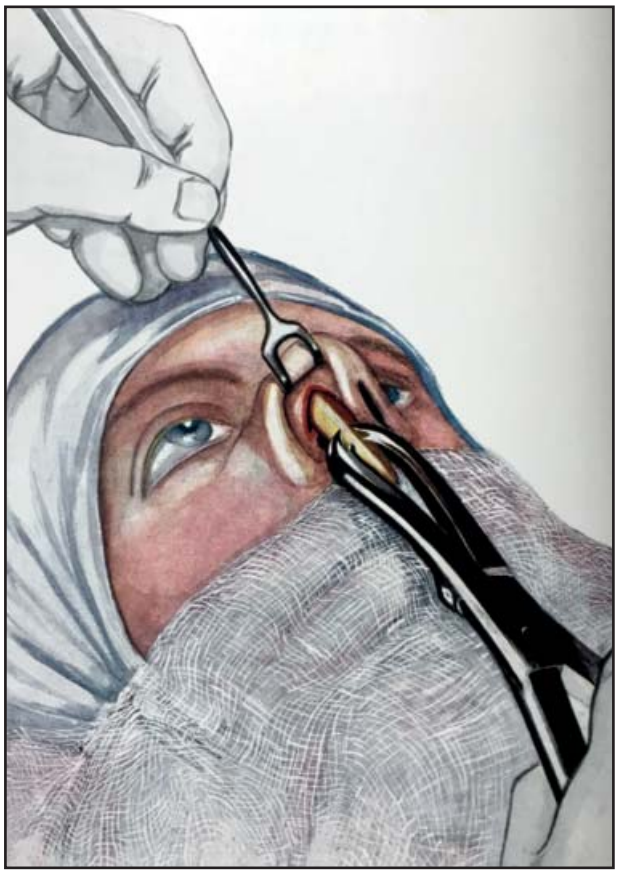

Fig. 21[2]
Intranasal placement of a bone graft according to the method applied by Joseph

shifting toward the midline. This effect is caused by transverse contraction of scar tissue, which sets in later."[2]

Reconstruction of the Nasal Framework

For of the reconstruction of bony and cartilaginous structures, Joseph developed several techniques (such as tibio-labial and tibio-brachial septoplasty) using free transfer of various autologous grafts. Bone grafts harvested from the tibia (fig. 19) and cartilage from the ribs played an important role. He also used ivory, which he obtained from the Berlin piano manufacturer, C. Bechstein. Joseph prepared the grafts in an osteoplastic laboratory.

Vise-jaw forceps were used for firm fixation of various bone grafts. The forceps were secured in a vise (fig. 20). In fig. 21, p.96, Joseph shows how the graft is introduced into the nose.

In June 1916, Joseph took over the direction of the Department of Facial Plastic Surgery at the Charité Ear Hospital from Adolf Passow (1859–1926). The main objective during the time of World War I was to provide surgical care for a large number of war-wounded patients, most of them presenting with severely disfiguring facial injuries. In the immediate vicinity of Joseph's facility was the Clinic for Neck and Nose Patients founded by Bernhard Fränkel (1836–1911) in the Charité Hospital. In 1911, Gustav Killian (1860–1921) was appointed to succeed Fränkel as head of the laryngology department. Like Joseph, Killian was an untiring and enthusiastic inventor. Not only did Killian develop numerous techniques for endoscopy in his field, such as suspension laryngoscopy and bronchoscopy, but also techniques for endonasal surgery of the sinuses and the nasal septum. When Killian moved to Berlin from Freiburg, the F. L. Fischer company opened a branch office at Luisenstrasse 64, just across the street from the Charité. This close collaboration enabled the development of many instruments, such as the Killian speculum and the Killian-Claus chisel. The catalogue texts explained the outstanding feature of "*English steel*" and the stringent tests of quality on hard bone.

Joseph's instruments represented in catalogues of the firms for instruments

As stated in the advertisement, the instruments of Jacques Joseph were manufactured by the Pfau company, Luisenstraße 48 in Berlin, only a few meters away from Fi-

Fig. 22
Advertisement of Joseph's book "Nasenplastik" by H. Pfau company 1928

Fig. 23
Frontispiece of Pfau Catalogue from 1928 with Joseph's instruments

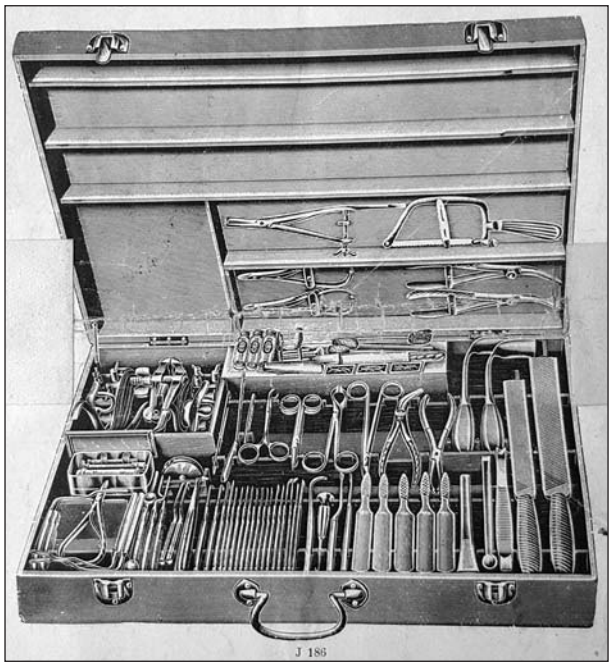

Fig. 24
Case with complete Joseph's instrument set in the catalogue of fig. 23

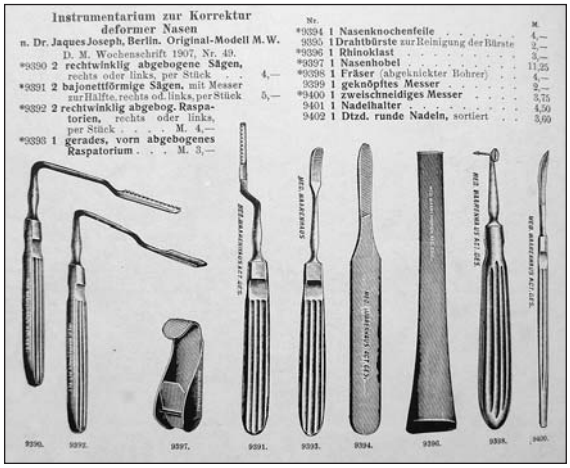

Fig. 25

Some of Joseph's instruments listed in the catalogue of Medicinisches Waarenhaus (1910, p. 197)

9390 right-angle-nasal-saw, right

9392 right-angle-nasal-periosteal-raspatory, right

9397 nasal plane

9391 nasal saw, bayonet shaped

9393 raspatory, slowly curved

9394 bone file

9396 rhinoclast

9398 right angle septum drill, angular bent

9400 plastic knife, double edged

Fig. 26
Joseph periosteal elevator fabricated by Karl Storz

scher's address, according to Joseph's instructions and some were made "*from best English steel*." The Pfau company also announced the publication of Joseph's lifework, the famous book "*Nasenplastik und sonstige Gesichtsplastik nebst einem Anhang über Mammaplastik und einige weitere Operationen auf dem Gebiete der äußeren Körperplastik*". [2] At bottom of this announcement we read: "*All the instruments described in the above mentioned work are manufactured by us according to the author's own statements*." (fig. 22, p.96)

Fig. 23 shows the frontispiece of Pfau' s special catalogue from 1928 [16], where Joseph's instruments and apparatus are depicted and described. Fig. 24, p.97, presents

the case with the complete set of Joseph's surgical instruments of that period.

Several of Joseph's instruments, however, were published and depicted earlier in the catalogue "*Medicinisches Waarenhaus*"[17] from ca.1910, to which the Pfau company had also contributed their products. From this last catalogue, some of Joseph's instruments are presented in fig. 25. The Pfau company, then the leader in the field, was dissolved in mergers more than twenty years ago. The initially used trademark was later lost.

Many of the instruments developed by Jacques Joseph have proved useful for decades. They are still included in the contemporary catalogues, for instance in the catalogue of Karl Storz, and are among the most demanded instruments for plastic facial nasal surgery like the "Joseph", the periosteal elevator (fig. 26, p.97).

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Picture credits

Figures 1, 7 – 13, 15, 16, 18, 19, 21 were taken from Joseph's book 1931(2)
Figures 2, 5, 6, 14, 17, 20, 22 – 26 were photographed by the authors.
Figure 3 was taken from Hess 2010 (9) and fig. 4 from Natvig 1982 (10)

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