УДК: 615.471 (091)

Brief history and description of the surgical instrument kit of the early 19th century

S.P. Glyantsev
National Research Institute of Public Health Russian Academy of Medical Sciences, Moscow

This article gives the brief overview of the history and evidence-based ascription of the "Field set of surgical instruments" made by the J. C. Schnetter (Munich, Kingdom of Bavaria), consisting of 29 instruments and dating back to the beginning of 19th century. It is intended to perform surgical procedures on the skull (trepanning and treatment of penetrating wounds) and extremities (amputation).

Keywords: *history of surgery, antique surgical instruments, surgical kit, ascription of medical antiques*

Today's growing interest in the establishment and development of medical museums in Russia places great demands on their creators and staff, custodians of the collection who must have knowledge of the history of medicine and be able to competently characterize the exhibits. Based on our personal experience of examining antique surgical instruments, we would like to provide a history and evidence-based characterization of the "field set of surgical instruments", of J.C. Schnetter (Munich, Kingdom of Bavaria).

Research Material

This field set of surgical instruments was manufactured in the workshop of J.C. Schnetter (Munich, Kingdom of Bavaria), presumably at the beginning of the XIX century. It consists of 29 instruments, including assembled and disassembled instruments, a case and two removable boards.

Picturer 1. Field set of surgical instruments (external view). Beginning of the XIX cen.

The case (size 47.5x24x10.5 cm, weighing about 4 kilos - approximately 9 pounds) is made of wood and glued worn black leather (with traces of heavy usage) and the corners are reinforced with brass (Fig. 1). On the top, also made of brass, are a handle, two "fasteners" and a lock.

The inside of the case is pasted over with a thick faded turquoise colored paper. It has two

Picture 2. Upper removable board with instruments for craniotomies.

Picture 3. Lower removable board with instruments for amputation.

✉ *E-mail: spglyantsev@mail.ru*

removable boards, pasted with a turquoise painted fabric. Attached to the fabric, like a wig, is a shorthaired fur of the same color. This same kind of fur on fabric that is pasted to the inside top.

The upper board (size 44x20.5x3.0 - Fig. 2) has instruments for craniotomies placed on it. The lower one (size 43.5x19.5x2.2) has instruments for amputation (figure 3). The boards have notches (slots or compartment) for the surgical instruments; each instrument fits in its own compartment, both having the same size and shape.

The information about the instruments, their purpose, size and material from which they are made are provided in the table below.

List of instruments in "Field set surgical instruments", manufactured in the workshop of J. C. Schnetter (Munich, Kingdom of Bavaria) approximately in the beginning of the XIX cent. [1-3][1]

Name, purpose (size, material)	Amount in Set	«Set»[2] 1 instrument (Amount in set)	«Non set» instrument (Amount in set)
Upper board: instruments for craniotomies			
Scalpels for dissection and excision of the skin, subcutaneous tissue and the meninges	2	In the right compartment – instrument set (16.5 cm; metal, wood)	In the left – non set, with brand «Villa» by the handle (15.5 cm; metal, wood)
Arched «trepan» for drilling holes in cranial bones – (23 cm; metal, wood)	1	Instrument set (№ 3); the metal portion of the handle has the brand «Schnetter»; a round headed screw lays separately (5 cm; wood)	
Circular saw ("bits") with a movable pyramidical rod inside and a device for fastening a trephine with the opposite side (8 × 2.5 cm metal)	3	Has three regular saws	
Lift ("elevator") with three holes and a movable plate on the working part for fastening the support (19.5 cm, metal, wood)	1	Instrument set (№ 8); close by in a separate compartment, includes a "saddle support" on two legs; 10.5 cm (metal, leather)	
Tweezers to remove loose lying bone fragments (approx. 14 cm metal)	1	Instrument set missing[3]	Wound hook (blunt) to extract bullets or foreign objects from wounds (12 cm metal, wood)
Knife with a "lens" ("lenticular") for aligning the burr hole edges (15.5 cm metal, wood)	1	Instrument set	
Depressor with "lens" ("lenticular") to protect the dura mater (15 cm, metal, wood)	1	Instrument set	
Probe to separate and protect the dura mater (approx. 28 cm; whalebone)	1	Instrument set missing	2 needles with handles in the form of "pills" (18 and 20.5 cm, metal, bone)
Brush (brush) to remove bone sawdust (8.5 cm; horsehair, bone)	1	Instrument set	
Double-edged flattened curved needle with an eye at the opposite end. For mending wounds (6 cm metal)	6	Available – one needle in set; 5 needles missing	2 sharp pointed instruments, similar to the tip of eye drops or removable «pegs», possibly for craniotomies (4.5 cm metal)

[1] The sources used for the characteristics of individual instruments.
[2] By "set" is understood as instruments which should be in the give collection
[3] Instrument "sets" which are missing can be additionally acquired.

Name, purpose (size, material)	Amount in Set	«Set» [1]1 instrument (Amount in set)	«Non set» instrument (Amount in set)
Lower board: tools for amputation of extremities			
Arched Brambilla amputation saw with two blades for sawing bones (42.5 cm, metal, wood)	1	Instrument set (№ 19); «Schnetter» in on the metal part of the arc at the handle; one sheet is inserted into the saw; the other one is free	
Frecke type screw tourniquet to stop bleeding from a wound or limb, (metal, canvas)	1	Instrument set; consists of two parts: 1) screw device (10.5 × 6.5 cm, brass) and 2) Belts (113 × 2,8 cm, red colored cloth) with a buckle (2.2 × 3.7 cm metal) with three prongs	
Large amputation knife by Bell and Koch for use on the confluence of soft tissue (33 cm, metal, wood)	1	Instrument set; on the metal part at the handle is the manufacturer brand «Schnetter»	
Small amputation knife (approx. 30 см; metal, wood)	1	Instrument set missing	Small amputation knife (30.5 см; metal, wood)
Small Savigni double edged knife ("Kathleen") (approx. 21 cm, metal, wood)	1	Instrument set missing	Saw for amputation of fingers (20.5 cm metal, wood)
Arterial forceps, (Frecke?) to stop bleeding from vessels (approx. 11.5 cm metal)	1	Instrument set missing	1 ocular forceps with teeth, «Luer France» brand (8.5 cm metal)
Bone forceps by Richter for clipping sharp ends of bones (approx. 11.5 cm metal)	1	Instrument set missing	
Catheters to drain urine from men (approx.. 25 cm, Silver)	2	Instrument set missing	

The results of the research

Visual and tactile examination of the instruments in question show that the case, removable boards and most of the instruments in the compartments are part of the set and are authentic. Some of them (see table) have the stamp of the manufacturer “Schnetter” (Fig. 4).

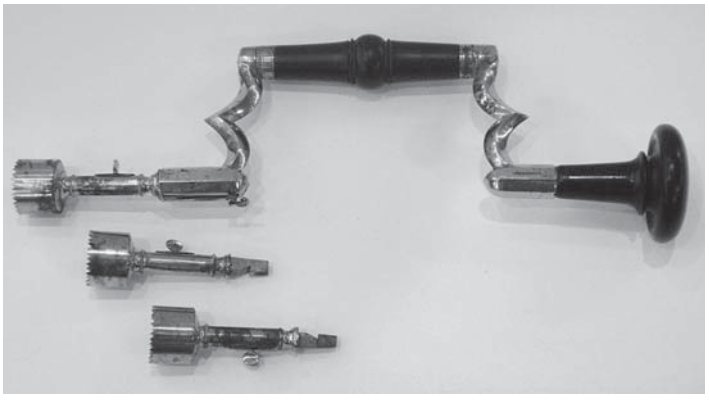
The appearance of the materials that make up the items, show traces of having been used for their intended purposes (everyday usage) and their condition corresponds with the presumed time of their manufacture (the beginning of the XIX century).

A distinctive feature of this set is the fact that the cover of the top (inside) and the boards for the instruments have been pasted over with colored fur, not with velveteen or velvet as was usually done. This may prove that the set was custom-built.

Picture 4. “Schnetter” brand on a trepan handle.

When examining the set of surgical instruments, the catalogue «Verzeichniss der

Picture 5. Scalpels and wound hooks.



Picture 6. Trepan with three removable bits

Picture 7. Lever on a saddle-like support

Picture 8. Lenticular and depressor.

anatomischen und chirurgischen Instrumente, welche um beygesetzte billige Preise verfertiget werden von Johann Caspar Schnetter chirurgischen instrumenten-Macher, und Pensioair der Akademie der Wifsenschaften zu München» was used. This catalogue was published in Munich in 1813; a list of the instruments from an analogous set can be found there [5].

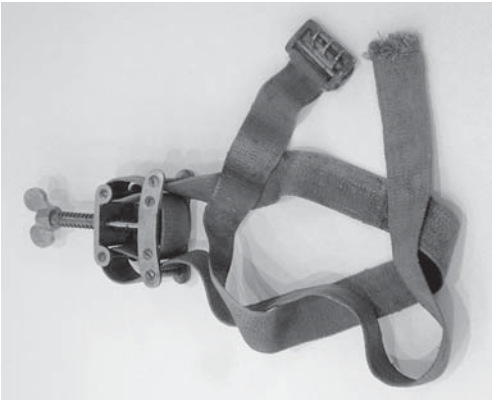
If the set did not exactly correspond with the one represented in the "Catalogue", we determined the position of the instruments through the form and arrangement of the compartment on the removable boards (for example, in the "Catalogue", bone forceps by Richter must be located on the upper board. However for the attributes of our set has compartments on the lower one). Such “inconsistencies" are quite acceptable. These kinds of sets were individually manufactured at the time and may have reflected the demands of the customer for the composition, number of instruments, as well as for their arrangement in the set.

There should be 18 “set” instruments on the upper removable board, but there are only ten "set" instruments and six “non-set” ones. There are eight "set" instruments that are missing (a scalpel, forceps for removing bone fragments, a whalebone probe and five needles). This combination of instruments also reflects their intended usage. Regular instruments could have been lost or broken in use and replaced with ones that were not part of the set.

Of the available instruments on the top shelf, the most interesting instruments are scalpels and wound hook for removing foreign bodies from the body, e.g. round lead bullets (picture 5), trephine with three removable "bits" (Fig. 6), a lever with a saddle shaped base, (no longer in use), (Fig. 7), a knife with a lens ("lenticular") to align the edges of the trepanation opening and a depressor for moving away dura mater (Fig. 8).

There should be nine instruments “from the set” on the lower board, but there are only three

Picture 9. Amputation instruments (knife and saws)



Picture 10. Tourniquet with a Frecke modification.

from the set and three that are not from the set. Six "set" instruments are missing (small-size and double-edged amputation knives, arterial tweezers, Richter bone forceps and two male catheters for urine). There are interesting knives, an amputation arc-shaped saw, a miniature saw for finger amputation (Fig. 9) and a Petit spiral tourniquet with a Frecke modification (Fig. 10).

Historical Information

In the workshop of royal instruments, the master, member of the Academy of Sciences of Munich, Johann Caspar Schnetter (1778-1860), produced anatomical instruments for public and private surgery and toolkits for the needs of the Royal Army; for this, JC Schnetter was awarded several medals[6].

The quality of the instruments made by J.C. Schnetter was highly regarded by the Royal Surgeon General Schwaab and the Russian Ambassador to the court of the King of Bavaria in Munich (1806-1812), Chamberlain, Prince I. I. Baryatinskiy (1772-1825).

In particular, a review by Prince I. I. Baryatinskiy dated July 12, 1812 suggests that the set of surgical instruments by J.C. Schnetter was successfully tested in Russia at the Medical Surgical Academy in St. Petersburg [5].

Judging by the quantity and the purpose of the instruments and comparing them with those of the regimental toolkit described in the book by J.V. Wylie (1806) [7], we can conclude that the given set is a regimental medical kit.

Conclusion

Judging from the attributes of the field (regimental) set of 22 surgical instruments in the case, it was primarily manufactured in the workshop of J.C. Schnetter (Munich, the Kingdom of Bavaria), presumably in the beginning of the XIX century (before 1813 - the date of the publication of the tools catalog). The set was designed for military regimental doctors (Wundarzt; in Russia - physicians) or field (battalion) barber surgeons (Feldscher, Wundchirurg; in Russia – physician) who performed the most common operations during a war, such as craniotomies, treating penetrating head wounds and different levels of amputation of the extremities.

Because of the purpose and conservation of the set, it is of high historical, cultural, museum and collection importance.

With the exception of instruments number 11, 12 and 22, the remaining correspond to the intended purpose of the set and the period of their manufacture.

This set may be of interest to surgical historians and collectors of medical antiques, as well as to historical socio-cultural museums with historical and medical expositions. It may be used by museums of medicine and surgery in Russia, CIS countries and Europe to display the state of medicine and surgery at the end of the XVIII-XIX centuries, and the wars waged in that period by European countries and Russia (e.g. the Russian Patriotic war of 1812).

REFERENCES

1. Bennion T. Antique Medical Instruments. Los Angeles: Univ. California Press, 1986. P. 17–40, 55–59; 63, 157, 172.
2. Warren D.J. Old Medical and Dental Instruments (Shire Album 308). Haverfordwest: Shire Publ. Ltd., 1994. P. 3, 10.
3. Wilbur C.K. Antique Medical Instruments. West Chester: Schiffer Publ. Ltd., 1987. P. 123–134.
4. Kirkup J. The Evolution of Surgical Instruments. – Novato: Historyofscience.com, 2006. P. 189–209, 296, 300, 367, 375–396.
5. Verzeichniss der anatomischen und chirurgischen Instrumente, welche um beygesetzte billige Preise verfertiget werden von Johann Caspar Schnetter chirurgischen instrumenten-Macher, und Pensionair der Akademie der Wifsenschaften zu München. München, 1813. S. 49. URL: http://books.google.ru/books?id=QgRPAAAAcAAJ&printsec=frontcover&dq=http://books.google.ru/books/about/Verzeichnis_der_anatomischen_und_chirurg.html&hl=en&sa=X&ei=jmskUoXTEcHmswaF6IDgCQ&ved=0CDMQ6AEwAQ#v=onepage&q&f=false
6. URL: http://www.europeana.eu/portal/record/92062/CA3E114015CDEDB788D3D5884B65D13F67AD49BF.html
7. Villie Y. Kratkie nastavleniya o vazhneyshih hirurgicheskih operatsiyah. (Brief mentoring on the most important surgical procedures) [in Russian] SPb., 1806.

Received: 23.12.13.

About the author

Glyantsev S.P. – Doctor of Medical Sciences, Professor; Head of the Department of the Medical Museology and Historico-medical Factography

The name of the article for the quotation: Kratkaya istoriya i opisanie nabora khirurgicheskikh instrumentov nachala XIX veka. Istoriâ mediciny. 2014. N 1. P. 186–192