



## Horst Otto Stoeckel: Collector and Museum Founder<sup>☆</sup>

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### ABSTRACT

As a medical student and during his preacademic time prior to 1958, Horst Stoeckel was interested in the history of medicine and especially history related to anesthesia. After his retirement from Chair of Anesthesiology at the University of Bonn in 1994, Stoeckel received a gift from Professor Richard Kitz of Harvard University (Boston, MA) that encouraged him to develop his collection of 150 artifacts and 350 books and periodicals into a scientific museum and library. The late librarian, Patrick P. Sim, MLS, of the Wood Library-Museum of Anesthesiology in the United States also encouraged and supported Stoeckel with literature concerning anesthesia history. The Horst Stoeckel Museum of Anaesthesiology (Horst-Stoeckel-Museum für die Geschichte der Anaesthesiologie) was dedicated by the University of Bonn and opened to the public on October 9, 2000, and currently has more than 1000 items displayed in 45 themed display cases. A newly themed concept of Incremental Development of Eminent Anesthesia Landmarks to Operational Routine was developed for the display and explanation of the history of anesthesia related to pioneers, equipment, books, and manuscripts. A display concept combining Person, Publication, and Apparatus is used throughout the museum. A well-stocked library currently holds more than 13,000 books and periodicals. The museum's 10-year anniversary was celebrated with a symposium entitled "German Pioneers in Anaesthesia of the first 100 years," held at the University of Bonn on October 8, 2010. The museum's Web site in German, English, and French is [www.anaesthesia-museum.uni-bonn.de](http://www.anaesthesia-museum.uni-bonn.de).

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### Collector and Museum Founder

From early and tentative beginnings, it was Horst Stoeckel's desire to develop a museum devoted to anesthesia. As a medical student and especially during his preacademic period prior to 1958, Stoeckel became interested in history and began collecting medical and anesthesia-related books and artifacts. While Chair of Anesthesiology at the University of Bonn, Stoeckel became good friends with three American anesthesiologists: Professors Emmanuel "Manny" Papper from the University of Miami (Miami, FL), Francis Foldes from the Albert Einstein College of Medicine (New York City, NY), and Richard "Dick" Kitz from Harvard University (Boston, MA). Stoeckel's early personal collection included approximately 150 artifacts and 350 books and periodicals, as well as numerous objects of provenance in anesthesiology, surgery, and physiology. After seeing this collection, Professors Papper, Foldes, and Kitz encouraged Stoeckel to start a museum to preserve and educate others regarding these historic items. Two particularly important gifts

convinced Stoeckel to establish a museum, the first being an original 1905 oral intubation set of Franz Kuhn<sup>1</sup> (Fig. 1), a surgeon at a community hospital in Kassel, Germany, given to him by Professor Witolt Jurczyk of the University of Poznan in Poland. The second gift was a replica of Morton's 1846 ether inhaler (Fig. 2A and B) presented to Stoeckel by Professor Kitz. Both objects were donated to Stoeckel in 1994 at the Second International Symposium on "Control and Automation in Anaesthesia" held in Bonn, Germany.<sup>2</sup> Patrick P. Sim, MLS, the late librarian of the Wood Library-Museum of Anesthesiology, now in Schaumburg, IL, was a personal friend of Stoeckel and also encouraged him to start a library and museum. In addition, the Wood Library-Museum of Anesthesiology has contributed various "extra" historical books (spare editions) and items in their collection to the Horst Stoeckel Museum of Anesthesiology (Horst-Stoeckel-Museum für die Geschichte der Anaesthesiologie). The Horst Stoeckel Museum of Anaesthesiology library presently has more than 13,000 titles, books, and periodicals in three languages: German, English, and French.

Stoeckel's philosophy for the development of a museum was to: (1) collect artifacts and literature; (2) classify the equipment, books, and articles in the collection; (3) organize the displayed items for the public; and (4) encourage and develop research. As part of a university, the museum had an additional obligation to interpret its collections. In 2008, the German Board of Sciences indicated that a university museum

<sup>☆</sup> This is Part 2 of a manuscript series on Horst Otto Stoeckel. Part 1 focuses on Horst Stoeckel's career as a clinician, administrator, and researcher.

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Fig. 1. Original oral intubation set of Franz Kuhn, circa 1905, given to Stoeckel by Professor Witolt Jurczyk of the University of Poznan in Poland.

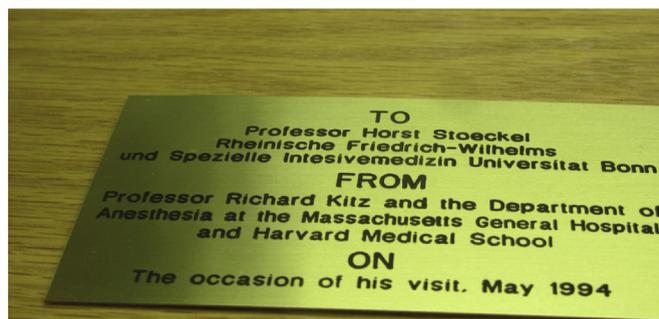
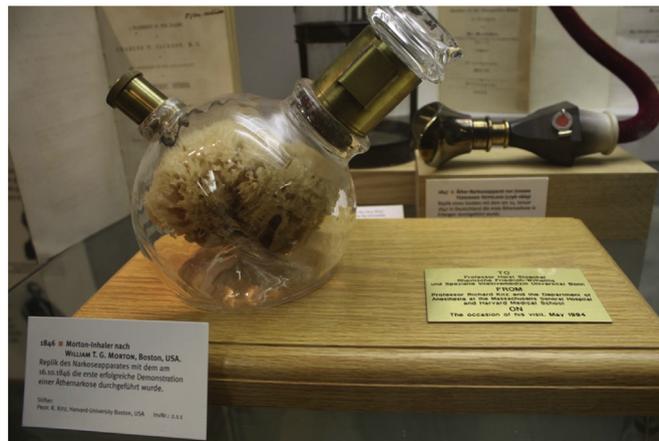


Fig. 2. A and B, Replica of Morton's 1846 ether inhaler presented to Stoeckel by Professor Richard Kitz of Boston, MA, during his visit to Bonn, Germany, in May 1994.

should “per se possess” the character of a historical institution and that the collections, including an irrevocable library, should be a scientific infrastructure for research. As such, the German Board of Sciences believed that these museums deserved the support of both governmental and nongovernmental authorities. Stoeckel focused the structure of his museum on this basis.

Stoeckel's personal collection forms the basis of the Horst Stoeckel Museum of the History of Anesthesiology at the University of Bonn (Fig. 3). The museum was dedicated in 1996 following his retirement from his position as Chair of the Department of Anesthesiology and opened to the public in 2000. Since the 2000 opening, the museum has grown to more than 1000 items displayed in 45 display cases, with each case devoted to a specific theme. The first section of the permanent exhibit presents the early and continuing development of anesthesia in the second half of the 19th century. The more than 170-year history of anesthesia is displayed, from the use of open-drop ether or chloroform to modern-day anesthetics, medications, equipment, and techniques (Fig. 4). The first section of the permanent exhibit presents the early and continuing development of anesthesia in the second half of the 19th century, which is the first 50 years of modern anesthesia history.

Since the museum's founding, Stoeckel aimed to incorporate an international presence in addition to his German collection. A permanent exhibit of more than 120 objects and 70 books are displayed in four large showcases of the “International Quartet” of France, Germany, Great Britain, and the United States. This exhibit was created to represent the second and more advanced period of modern anesthesia history from 1901 to 1950. This is presented with the context of concurrent mutual development and progress across the four countries, allowing for comparison of the presented items. The chosen time periods have been completed through various interactions of Professor Stoeckel with the friendly collecting efforts of numerous colleagues and institutions from France, Great Britain, and the United States.

The museum has been involved in several meetings and symposia. In 2000, the opening ceremony of the Horst Stoeckel Museum of the History of Anaesthesiology for the public was held at the “Festakt” of the University of Bonn. Dr. George Bause, Honorary Curator of the Wood Library-Museum of Anesthesiology in Schaumburg, IL, presented a Certificate of Recognition from the Wood Library-Museum Board of Trustees to Stoeckel and gave a presentation (Fig. 5A and B). Dr. David Wilkinson

from the United Kingdom, a well-known anesthesiology historian, was also an invited guest lecturer (Fig. 6).

In 2004, the museum contributed landmark objects to the exhibition of “les instruments d'anesthésie et de réanimation” (1847–1970) alongside other collections from France and the United Kingdom at the XIII World Congress of Anaesthesia in Paris. In 2005, Stoeckel was invited to Cambridge to exhibit artifacts at the Sixth International Symposium of the History of Anaesthesia. Artifacts from the museum were also displayed at the 2007 annual meeting of the European Society of Anaesthesiology, “Euroanaesthesia Congress,” held in Munich, Germany, from June 7 to 9, 2007. A symposium entitled “Deutsche Anästhesie – Pioniere der ersten 100 Jahre—1847 bis ca. 1950<sup>3,4</sup>” (“German Pioneers in Anaesthesia: The First 100 Years 1847–1950”) was held from October 8 to 9, 2010, at the 10-year anniversary of the museum. At this symposium, Sir Peter Simpson from the United Kingdom gave a presentation as the invited guest lecturer (Fig. 7) in addition to numerous other speakers from Germany.

The permanent exhibition in its current state was finalized in December 2014 and published to the Internet in 2016. The Web site of the museum is [www.anaesthesia-museum.uni-bonn.de](http://www.anaesthesia-museum.uni-bonn.de).<sup>5</sup>

## Permanent Exhibits

### Single Display Items: Highlights of the Museum

- Morton's ether inhaler (1846) (Fig. 2A and B);
- Maximilian Neu's introduction of flowmeters produced by the Rota Company (1909) in Aachen, Germany, for oxygen and nitrous oxide (Fig. 8);
- The Draeger Iron Lung, used in the 1952 poliomyelitis epidemic in Copenhagen, Denmark, and the history of long-term mechanical ventilation;
- The oldest and largest (in size) anesthesia workstation<sup>6</sup> (Fig. 9) from 1958, which integrated formerly separated monitoring systems for patients' vital signs;
- The transfusion mill of Alfred Beck (1923) for donor to patient transfusion using a roller pump method—a first in medical use;
- A Percy glass tube (1915) brought to Germany by the Soviet army in 1945, still filled with conserved blood;



Fig. 3. Building housing the Horst Stoeckel Museum of the History of Anaesthesiology at the University of Bonn, Bonn, Germany.

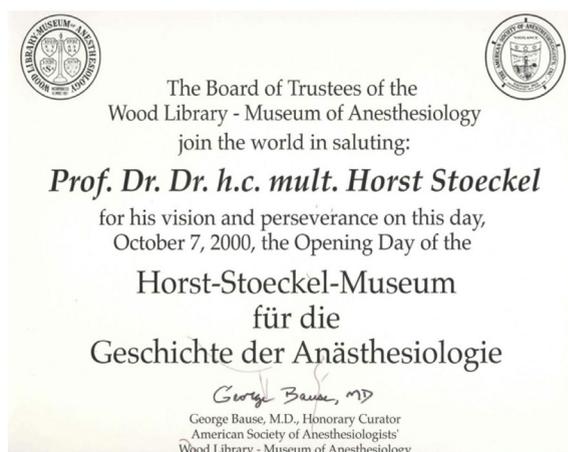


**Fig. 4.** The first section of the permanent exhibit presents the early and continuing development of anesthesia in the second half of the 19th century. "Inhalation Anaesthesia 1846-1900," the first 50 years—items from Europe and United States. Stoeckel is shown providing a personal tour of the museum to a visitor, November 21, 2005.

- An original ampule of Intocostrin (1942), a predecessor of modern muscle relaxants still composed of pulverized leaves of curare plants;
- The world's first blood pressure measuring apparatus appropriate for clinical use (S. Riva Rocci, 1896, Pavia, Italy).

*"An Ensemble of Objects and Space"*

An example of an "ensemble of objects and space" is a complete operating theater (Fig. 10) donated by the Hospital for



**Fig. 5. A and B,** The Horst Stoeckel Museum's opening ceremony for the public on October 7, 2000, was held at the "Festakt" of the University of Bonn. Dr. George Bause, Honorary Curator of the Wood Library-Museum of Anesthesiology in Schaumburg, IL, presented the Certificate of Recognition from the Wood Library-Museum Board of Trustees to Professor Stoeckel and gave a presentation.



**Fig. 6.** Dr. David Wilkinson from United Kingdom was an invited guest lecturer for the “Festakt” at the University of Bonn on October 7, 2000.

Lung Diseases near Magdeburg in the former East Germany. It is a time capsule that is a highlight of the entire collection, with the original table, lights (Fig. 10), intravenous infusion apparatus, anesthesia gas machine, and instruments. The anesthesia gas machine is a precursor of the 1935 Draeger model “MU”

(M = machine, U = overpressure for delivering overpressure ventilation during open thoracic surgery) and incorporates Sauerbruch’s special anesthesia breathing system. Of note, the Japanese Museum of Anesthesiology also includes an operating theater set from the 1960s.



**Fig. 7.** Professor Sir Peter Simpson, United Kingdom. Invited guest speaker at the 10th anniversary of the Horst Stoeckel Museum on October 10, 2010.



Fig. 8. Maximilian Neu's flowmeters (first worldwide) produced by the Rota Company (1909) in Aachen, Germany, for oxygen and nitrous oxide.



Fig. 9. Heinz Oehmig's 1958 largest and first worldwide monitoring and anesthesia workstation.



**Fig. 10.** 1930 operating theater obtained from the Hospital for Lung Diseases near Magdeburg in former East Germany—a highlight of the entire collection.

### The “Person, Publication, and Object” Approach

A combined approach uniting Person, Publication, and Object (apparatus or pharmaceuticals) is used in the presentation of numerous displays. The Person, Publication, and Object presentation concept is used to display anesthesia contributions from Germany, other European Union countries, and the United States from 1846 to 1900.

Books are shown as integral elements and relevant parts of the museum’s permanent main collections. Well planned and aesthetically placed, the books that are presented not only make the exhibition visually interesting for the observer but also develop a more complete and intellectually stimulating story than from merely displaying the object and/or its associated accessories alone. Displays uniting anesthesia pioneers, their publications, and their apparatus allow the viewer and researcher to better understand the significance of a particular innovative idea or concept, while at the same time helping to give the innovation a personal touch by relating the specific innovation to a face and name.

This technique is used to help illustrate the connection of the person who invented the apparatus or technique to his or her publication and/or apparatus. An example of the united Person, Publication, and Object concept is used for the display presentation of Franz Kuhn’s “oral intubation” set (Fig. 11A and B), as well as Morton’s ether inhaler (1846), Esmarch’s (1865) and Junker’s (1867) chloroform inhalers; Clover’s

(1877), Julliard’s (1877), Wanscher’s (1884), and Kappeler’s (1890) ether inhalers; and Schimmelbusch’s ether mask (1890).

Important displays using the “Person, Publication, and Object” approach are Friedrich Trendelenburg’s first (1869) intubation anesthesia set with an inflated cuff cannula placed by tracheostomy (Fig. 12), as well as an early 1864 anesthesia set of Friedrich von Esmarch, who introduced open-drop anesthesia as a routine procedure in Germany.

### Timeline Displays: Illustrating Progress Over the Course of Time

Timeline displays are the underlying sorting principle of all collections. Particularly noteworthy are the 3 original sections:

- The “International Nation” of 7 European nations plus the United States, displaying items of the first 50 years of anesthesia (1846–1900).
- “The Quartet: Germany, France, Great Britain, and the USA,” displaying the second 50 years of anesthesia from 1901 to 1950 in a circle with examples of anesthesia apparatus, books, and articles.
- Examples of displayed objects and books or periodicals with corresponding authors and inventors from the United States are Connell (1912), Gwathmey (1914), Flagg (1919), Labat (1922), McKesson (1930), Waters and Guedel (1931), Beecher (1938), Adriani (1941), Heidbrink (1942), and Bonica (1953).



**Fig. 11.** A and B, Display concept uniting Person, Publication, and Apparatus: anesthesia pioneer surgeon Franz Kuhn (1866 to 1929), 1911 monograph (“Per Oral Intubation”), and oral intubation apparatus.

- The 100-year development of anesthesia apparatus in Germany from 1902, including compressed oxygen and dosing devices for drop counting via target controlled infusion modules to direct injection of volatile anesthetics (Fig. 13).

Further collections using timeline displays include a “Special, Rare Collection” area separate from the main collection that shows the use of plants such as mandragora, opium, nightshade, and cannabis as a resource for “anesthesia-like” compounds and chemicals before the introduction of Morton’s 1846 ether anesthesia. Opium poppy, coca leaves, and curare plants are natural plants that are still used after transformation by the pharmaceutical industry to morphine, cocaine, and intocostin, respectively. The first inventors or clinical users of cocaine and intocostin, respectively, were Sertuerner (1805–1817, Germany), Koller (1884, Austria), and Griffith and Johnson (1942, Canada). These collections are located in relatively small showcases and are indicated in the museum as (a) opium—from narcotic drug to several pharmaceuticals in clinical anesthesia and pain therapy, (b) coca—from natural substance of indigenous tribes to the first regional anesthetic cocaine, and (c) curare—from indigenous arrow poison to the pharmaceutical drug in the anesthetic intocostin.

Additionally, there is a collection of 19th-century wire frame anesthesia masks, beginning with the authentic Schimmelbusch mask (Berlin) of 1890. This simple drop method with ether and chloroform spread rapidly throughout Europe and the United States and was used through the 1960s (Fig. 14A and B).

The Operating Room is also equipped with two large showcases. The first illustrates the development of intravenous infusion techniques

from early glass containers in the middle of the 19th century to plastic infuser bottles (1968) and, finally, to software-controlled infusion pumps (ca. 1990). The second showcase illustrates the development of hemorrhagic shock therapy from dried human plasma solutions (Abbott, World War 2) and the first synthetic macromolecular-based plasma expander (Periston Bayer, 1942) to a complete collection of German devices for direct blood transfusion.

A vaporizer section also shows the development of early manual “dosing” in inhalation anesthesia from “bubble bottles” (J. Gwathmey, United States, 1912, and Boyle, United Kingdom) to ether apparatus with added Boyle’s plungers (1930) and improved with Coxeter’s dry flowmeter (1933). Important progress toward exact quantification of volatile agents began with the American Lucien Morris’s “Copper Kettle” in 1952 and the British ICI Fluotec apparatus (1959)—that competed with Draeger’s Vapor system (1960)—culminating in Draeger’s DIVA system (Direct Injection of Volatile Anaesthetics) in 2000.

Further themes exhibiting progress over time include (a) Monitoring at the Intensive Care Unit: the development of long-term artificial ventilation beginning with mechanical ventilators proceeding to the electronic and microprocessor-controlled ventilators; (b) Monitoring of emergency medicine focusing on respiration and cardiovascular monitoring and a collection of analgesic and respiration stimulating drugs; (c) Drugs and anesthesia equipment used during World Wars I and II; (d) One of the largest museum collections (132 items) of pharmaceutical drug boxes, vials, and ampules divided into the categories of hypnotics, analgesics, muscle relaxants, emergency use, and cardiopulmonary

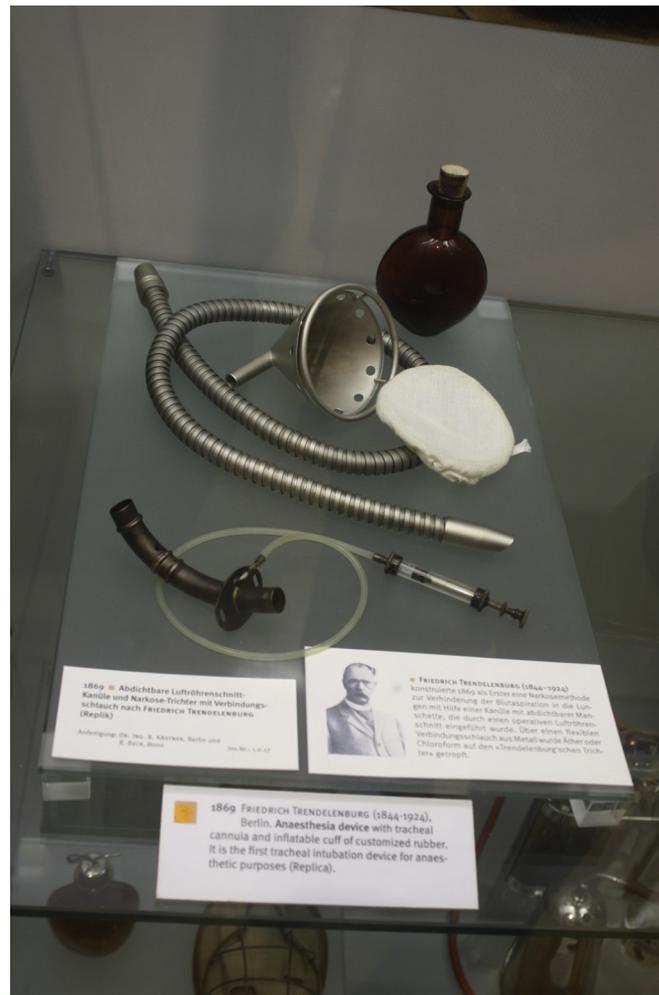


Fig. 12. Friedrich Trendelenburg's first (1869) intubation anesthesia set with inflatable cuff cannula performed by tracheostomy.



Fig. 13. Display cases contain the 100-year development of anesthesia apparatus with compressed oxygen and dosing devices from drop counting to direct injection of volatile anesthetics.



Fig. 14. A and B, Collection of the 19th century wire frame anesthesia masks (A) such as the internationally known Schimmelbusch mask of 1890 (B).

resuscitation; (e) Older landmark drugs not used in anesthesia but developed first in the German and Swiss pharmaceutical industries (Fig. 15A-C); (f) Obstetric anesthesia; and (g) Pediatric anesthesia.

### Incremental Development of Eminent Anesthesia Landmarks to Operational Routine

Five “Innovation” sections are part of the museum. Three were originally created when the museum opened, and two have been recently introduced as special collections in the main anesthesia exhibition area. A new concept was also developed and introduced by the museum to highlight areas of various museum displays that demonstrate innovation in anesthesia. This concept is referred to as *Incremental Development of Eminent Anesthesia Landmarks to Operational Routine* (IDEALOR). IDEALOR is a specific format and layout for objects in the collection, which shows their development in the field of anesthesia. Five eminent anesthesia landmark techniques from 1901 to 1951 are described on the museum’s Web site.

The casual visitor or experienced researcher can focus their attention on the most important discoveries, landmark books, and manuscripts in medicine and anesthesia by sorting and classifying the exhibits according to collection themes and time periods. Original first-edition rare books are exhibited, including those of Bibra and Harless (1847), Pirogov (1847), Bouisson (1850), Flagg (1851), Snow (1858), Bernard (1875), Buxton (1882), Lyman (1881), Kappeler (1880), and Dubois (1894), among others.<sup>7–16</sup>

In IDEALOR panoramic view, the rear wall of the display case for each innovation contains, on average, 15 international anesthesia pioneers characterized chronologically with relevant information displayed in one column each underneath pictures of the pioneers

(Fig. 16). Each pioneer is described with a portrait, life dates, and eminent contributions to evaluate the anesthesia landmark, including a photograph of the object invented or book published. The presentation of the anesthesia pioneers in the IDEALOR format using columns and rows as a matrix allows for an informative comparison of each individual and concept, helping to place the associated relevant ideas into proper context. This method also facilitates the evaluation of a specific landmark and its progress in a chronological timeline for general recognition and provides context for how the landmark fits into anesthesia history. The best example of the IDEALOR landmark format is “The Development of Orotracheal Intubation” exhibit as seen in Figure 16.

Other IDEALOR anesthesia landmark formats are (a) the development of monitors and monitoring techniques; (b) the development of regional anesthesia from C. Koller’s cocaine drop anesthesia in eye surgery<sup>17</sup> (1884) to Tuohy’s continuous epidural catheter for epidural anesthesia (1940); and (c) the development of intravenous anesthesia from Oré’s intravenous chloral hydrate anesthesia (1874), Total Intravenous Anesthesia, and the 1st H. Schwilden’s and H. Stoeckel’s Computer-Assisted Titration of Intravenous Anesthesia (1978) via Computer-Assisted Continuous Infusion (1985, Duke University) up to the first commercial target controlled infusion such as the Disoprifusor Vial Médicale (1996).<sup>18</sup>

A series of prototypes of the IDEALOR concept include (a) the development of nitrous oxide anesthesia with focus on Germany from Hiltscher (Austria 1886) leading to Neu’s (Ing. K Küppers) original (1909) rotameters for O<sub>2</sub> and N<sub>2</sub>O and ending with Dräger’s first anesthesia apparatus equipped with rotameters (1948); (b) the development of blood gas analysis from experimental blood gas pumps to essential clinical monitoring; and (c) the development of electrodes from Ludwig (1865) to Zuntz (1868) to Severinghaus’s CO<sub>2</sub> electrode (1958) to



**Fig. 15.** A-C, Large collection of pharmaceutical drug boxes, bottles, ampules, and vials which demonstrate the development of pharmacy and drugs from 1875 to 1930. Top, A (1850-1875); middle, B (1875-1900); bottom, C (1900-1930).

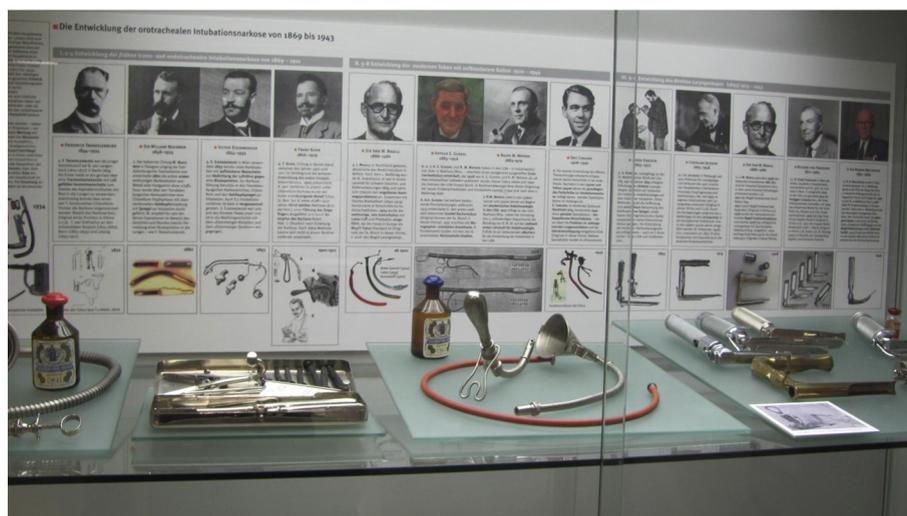
Astrup's (1959) pistol-like micro-pH-electrode and, finally, to the first commercially available automatic analyzer (1973).

## Conclusion

The University of Bonn and the German Society of Anaesthesiology and Intensive Care Medicine (Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin), both main supporters, play a significant part in the museum. The museum is designed to be useful not only for Germany itself but also for the European Union and other international communities. The Horst Stoeckel Museum of Anaesthesiology strives to collect and present high-quality museum pieces, books, and journals and to allow researchers to conduct high-level research, all while remaining one of the premier anesthesia and critical care collections in the world.

## Acknowledgments

The author interviewed Professor Stoeckel in March 2009, February 2010, and June 2014 at his museum in Bonn, Germany, and in June 2011 and 2012 at the European Society of Anaesthesiology meetings in Amsterdam and Paris, respectively. For interviews in Bonn, Germany, the Department of Anesthesiology at the University of Kansas Medical Center provided partial travel funds. He is grateful for the numerous telephone conversations, e-mails, and sharing of Professor Stoeckel's photos in the preparation of this manuscript, all of which have his permission to be printed in this manuscript. Numerous other photos taken by the author (ALK) have the permission of Professor Stoeckel for use in this manuscript. All museum items shown are the property of the Horst Stoeckel Museum of Anaesthesiology. The author is also grateful to Nicole Stoeckel, Horst Stoeckel's daughter, for her assistance



**Fig. 16.** IDEALOR landmark exhibition format example, “The Development of Orotracheal Intubation” from F. Trendelenburg’s “cuff” in 1869 via the contributions of W. Macewen, F. Kuhn, S. Robeson, J. Magill, A. Guedel, R. Waters, A. Kirstein, C. Jackson, R. Forreger to R. Macintosh’s curved blade laryngoscope in 1943.

in reviewing the manuscript for accuracy and providing additional factual details and edits. The author would also like to thank Walter Orr, MPH, for editorial assistance and manuscript preparation. This manuscript is dedicated to Professor Stoeckel in honor of his 88th birthday on September 26, 2018.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.janh.2018.08.004>.

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