Modelling the Human – Modelling Society
Anatomical Models in Early Twentieth-Century Vienna and the Politics of Visual Cultures

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In February 1945 one of the most comprehensive anatomical collections, that of the Anatomical Institute of the University of Vienna, was destroyed to a large extent when the anatomy building was hit by a bomb in the last weeks of WWII. A significant number of the objects that survived the destruction of the house and the subsequent fire were finally eliminated in 2006 to make way for new computer laboratories. These caesurae in the history of the once comprehensive collections were accompanied by the “natural loss” that all anatomical collections have to face, that is to say the decay that endangers mainly preparations and other forms of human remains but to a certain extent also anatomical models, especially the more delicate ones.

The pieces today labelled as “Remains of the Old Anatomical Museum” are stored in large wooden vitrine cabinets in a storage space under the lecture hall ceiling of the anatomical institute. At first sight, the objects in the collection are surprising in their diversity: artful and delicate wet and dry preparations are surrounded by bulky objects painted in brown and rose models in parts that can be plugged together, medical moulages, plaster casts and an unfinished wire model of the neuronal stems of the brain.

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1 GISEL Alfred, Die Bedeutung der Wiener Anatomie, Wien, Jugend u Volk, 1958, pp. 204-10.

2 University Archive, MED S 22, Anatomisches Institut. I thank Prof. Mircea Konstantin Sora, last custos of the anatomical museum until the educational reform in 2002, for sharing his memories of the younger history of the collections (Interview, 22.2.2012).
Most of these objects that have survived until today were produced in the late nineteenth and early twentieth century, when anatomical modelling boomed, medical moulages had their heyday and people were still producing a large number of preparations. Anatomists, craftsmen, artists and sometimes biopoliticians cooperated in the production of anatomical visualisations such as anatomical models that later unfolded their epistemic potential not only in academic institutions of anatomy, lecture halls, preparation rooms, laboratories, print publications, collections and clinics, but were also circulated and used strategically in more popular contexts such as museums and health exhibitions.3

It is thus surprising to see that the models found today in the Viennese collections look at the same time homogeneous and exceptional – especially compared to models in other centres of anatomical imaging.4 What makes them somehow different is the fact that they do not adapt an artistic manner and that they seem to resist any aesthetisation. Furthermore, they lack a common attribute of models: to simplify, to guide the hand and the eye by structuring a complex state of affairs. What were their audiences, their uses and situations? What were the arguments and discourses in which they played a role? Lastly, why – at first glance – don’t we find in the models traces of the vivid and well-known local tradition of artistic anatomy for which Vienna was praised?

Research on anatomical models is often done with a focus on their context in anatomical collections and their eventful history. This is for good reason, as collections are the primary point of reference for the contained individual objects. However, the history of anatomical modelling contains further aspects, showing anatomical models as powerful artefacts within urban structures, between local milieus and their international networks. Working from and with these artefacts reveals, I will argue, vivid stories about drawing social landscapes and about producing highly strategic and political images and propagating knowledge about the body. Not only their conception and features, but also the uses and later careers of these objects in collections, museums and reprints seem to intertwine with the notions of science, health, subjectivity and a society of individual actors.

In my paper I propose to investigate anatomical models as artefacts of visual cultures of the production of knowledge, meaning and evidence. As Hans Jörg-Rheinberger has claimed, a model is a model in regard to what it leaves behind.5 So what is its surplus value? How were preparations and sketches transformed into final models and what epistemic processes are linked to the individual work steps? In

3 I understand biopolitics as the linkage between large-scale institutions and small-scale interventions in the bodies of individuals.
4 My main points of reference were Heidelberg (Institute for Anatomy), Berlin (Charité), Dresden (DHM), and London (Hunterian Museum, Royal College of Surgeons).
contrast to the anatomical atlas, modelling is often associated with making visible things that cannot be seen with the naked eye. Even more, modelling means picturing things that did not exist before, that were produced in the process of modelling, which is why a model is not an image in the sense of a reflection. Consequently, how much is anatomical modelling about designing a stable physical object and how much about structuring, creating knowledge, orientation and order? And finally, how do politics and processes of segregation intertwine with modelling practices?

In the first part of this paper I will trace the history and the topographies of visual cultures of anatomical modelling in Vienna. The second and third parts of my paper will focus on different milieus in the interwar period and their locations and fields of action. My analysis of Ferdinand Hochstetter’s modelling practices in the second part will be linked to an investigation of processes of segregation and exchange between different local modelling cultures and communities in the third. Following places, actors and artefacts will finally allow me to show how a modelling of the development of the foetal gastro-intestinal tract links to the Dresden Gläserne Mensch and the modelling of a crime scene.

**Topographies**

Since 1404 we have proof of legal dissections at the University of Vienna, and since the late eighteenth century of systematic collection. Anatomical collecting, however, has a longer tradition with individual collectors like Gerard Van Swieten, the private physician of Empress Maria Theresia, who among others contributed with his private collection and his own preparations to the first foundations of the later university-owned holdings.

The better known history of the anatomical museum starts with one of its main early promotors, Josef Hyrtl (1810-1894), who reportedly imported Ruysch’s method of injecting and preparing specimens to Vienna where he dedicated his life to the museum’s perfection. He was known for his lively and demonstrative...

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7 Van Swieten donated precious injection preparations of Ruysch, Albinus and Lieberkühn to the museum. Preparations were also contributed by the anatomists Barth, Prochaska, Mayer, and Berres. The decretes of Stift, issued in the context of enlightenment and the aim to make education more demonstrative, made this praxis compulsory for full professors and prosectors. Between 1809 and 1832 the government bought a number of private collections (1809: Vering’s collection of bones, 1818: Prochaskas collection, 1822: Wirtensohn’s, 1822: Hofmayer’s, 1829: Carabelli’s and Harrach’s, 1832: Mayer’s), that were the basis for the collections of the anatomical institute. LESKY Erna, *Die Wiener medizinische Schule im 19. Jahrhundert*, Graz, Böhlau, 1965, p. 91.

(anschaulich) lectures and took over the responsibility for the anatomical collection and the museum as an assistant. When he finally took the chair of anatomy in 1845 he is said to have boosted the rise of Viennese anatomy by giving it a material foundation. Hyrtl considered anatomy as “partly science, partly art”, and thus saw anatomical preparations as “art and science”. In 1860 he created his “Laokoongroup”, a tableau of skeletons enacting the famous antique artwork. Self-reflectively, the passionate collector admitted to suffering from the weakness of assuming that the beauty of his work, its aesthetic appeal, was most essential. With his corrosion preparations he attracted attention at the 1873 World Fair (Vienna), which made the collection known worldwide.

A generation later, around 1900, Vienna housed one of the leading medical faculties in the German-speaking lands. Most of all because of its collections, which had been grown to a considerable number, and its vivid visual culture in combination with a good supply of corpses (death and life, dissection and clinic) it remained a centre for medical education and popular among researchers and students from all over the world. University reforms in the mid nineteenth century had made access easier and led to a strong increase in the number of students, resulting in the establishment of a second anatomical chair and the construction of a new building. Since its construction in the 1870s, this anatomy building was divided between two anatomical chairs with separate lecture and dissection halls and labs, but the aforementioned anatomical museum together with a library were for common use.

During the first decades of the twentieth century, the visual traditions of the two chairs started to become increasingly different from each other, just as their modelling practices. However, the larger background for this development was an increasing ideological division between two groups within the Viennese medical Faculty, which had ultimately led to the establishment of the second chair and the

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9 Hyrtl held the chair from 1845 to 1873. In Vienna it took a long time for anatomy to become accepted; the first chair of anatomy was established in 1735 and at the Josephsakademie anatomy and physiology were taught together even until 1832. PERNKOPF Eduard, “Josef Hyrtl”, in Fritz Knoll (ed.), Österreichische Naturforscher, Ärzte und Techniker, Wien, Verlag der Gesellschaft für Natur und Technik, 1957, pp. 90-92, p. 90.
10 HYRTL Joseph, Vergangenheit und Gegenwart des Museums für menschliche Anatomie an der Wiener Universität, Wien, Braumüller, 1869, p. LXXXI.
architectural division. The first chair, left wing and multi-ethnic, had a clinical, functional orientation; the second chair, conservative, a morphological and analytical-descriptive tradition. What is more, in the anatomy building the socio-political segregation of early twentieth-century Vienna was more evident than anywhere else: the first chair provided a safe environment for students and researchers with a Jewish background, social democrats and women, while the second chair was a milieu for conservative groups, pan-Germanists and later national-socialists. In the interwar period this dichotomy became more problematic in the context of a general radicalisation of broader societal spheres and ended in regular violent attacks by right-wing students against students, staff, and facilities of the first chair, especially targeting Jewish people or people considered as such.

In the early and mid twentieth century, the main place for anatomical modelling in Vienna was the so-called Mediziner Viertel, where academic places condensed in the urban landscape close to the city centre and around the general hospital. The hospital was surrounded by enterprises offering standard teaching aids produced by renowned enterprises such as Somso in Sonneberg. Behind the hospital were found the aforementioned Josephinum with its anatomical wax cabinets and a newly founded Institute for applied medicine and artistic anatomy. The dominant place in the topography of anatomical modelling, however, was the anatomy building with its museum collections as the key local resource.

Earlier, during the revolution of 1848, Josef Hyrtl, in order to rescue the core parts of these collections had brought them to the Josephinum, located at Währinger Straße 25, where it was partly united with holdings of the by then closed Military Surgical Josephsakademie. When the academy was reopened in 1854, however, Hyrtl was forced to move once again, only a few blocks closer to the city centre to Währingerstraße 13. He first got space on the ground floor of the old building of the “rifle factory” (of miserable quality, as he always complained). With

15 Hyrtl describes the collections as being made up of two parts, a comparative anatomical one and one on human anatomy, and stored in sections, skulls, vascular varieties, microscopic injections, preparations of arteries, veins, sense organs, in a room of 70 “Quadratklafter” (251m²), divided into two halls. The library was considered part of the museum that was connected to the lecture hall. HYRTL Joseph, Vergangenheit und Gegenwart des Museums, op. cit., p. lxxi.
16 The academy in the Josephinum was closed in the 1870s and set free personal resources that could not easily be integrated in the first anatomical chair. Together with demographic demands and an increasing segregation of two groups within the faculty this led to the establishment of the second
the opening of the new building the collection was moved to the top floor where the “museum” was installed in representative, centrally located, bright halls.\textsuperscript{17}

In the first decades of the twentieth century the Museum for Anatomy of the first and the second anatomical chair of the University of Vienna, as it was then called, was looked after by a Custos, employee of the second chair, who was also responsible for the Josephinum Collection next door. The custos arranged for students to see and touch bones, preparations (dry, corrosion, wet) and models in the labs and for researchers to borrow them – a system that was kept up until the 1990s.

Especially in the interwar period, the growing segregation of the two chairs, both socio-politically and scientifically, was visible in the structural organisation of the building. While the first chair was responsible for x-ray laboratories, had twenty working spaces and “the museum in common with the second chair” – the second chair, responsible for developmental history and comparative anatomy of vertebrates, had a collection of anatomical preparations for lectures, a collection of anatomical slides of the human embryo, a collection of slides of vertebrate embryos, and a collection of wax plate models on developmental history.\textsuperscript{18}

According to the rare archival sources and catalogues that provide information about its history, the collection expanded from 359 pieces that were counted for the first time in 1772 to over 5,000 items in the late nineteenth century.\textsuperscript{19} Between Hyrtl’s catalogue and one from the 1950s we have no exact numbers of the large gains and losses incurred by the collections. A large part of Hyrtl’s collections is said to have been lost during the relocations (after moving into the barack on the grounds of the rifle factory his collection contained over 5,000 items). However, in the following decades the museum was reportedly enriched by Hyrtl’s successor, Carl Langer (ordinari 1874-1887/after 1884 first chair), and after the division of the chairs by Carl Toldt (2\textsuperscript{nd} chair 1884-1909) and Emil Zuckerkandl (1\textsuperscript{st} chair 1888-1910), but anatomical that was housed in the Josephinum until it moved into one wing of the new building. Hyrtl retired at the same time, in 1873, which could indicate that a generational change advanced the need for a second chair.

\textsuperscript{17} The Museum was housed in a room of 21 window fronts and in 1929 is described as one of the largest anatomical museums (pathologies not counted) with neurological (comparative anatomical series on animal brains), splanchnological (larynx: 130; nasal cavity and paranasal sinus: 140; bronchia: 240; development and varieties of teeth: 90) preparations. Akademischer Senat, \textit{Die Universität Wien}, p. 50, \textit{op. cit.}

\textsuperscript{18} Report Friedrich Ehmann, 1945, MED S 22, Anatomisches Institut, Vienna University Archive.

\textsuperscript{19} The first catalogue was made in 1772; in 1869 Hyrtl counted 5219 preparations (see footnote 9); Friedrich Ehmann described the collection in 1945 (see footnote 16); Konrad Allmer made a catalogue between 1954 and 1963 (Library of the anatomical institutes Nr. 162-A - 65) and here refers to an undated slip box-catalogue that still exists; LISCHKA Martin F., \textit{Katalog der Präparate des Museums der Anatomischen Institute}, Wien, 1977; HORN Sonia, \textit{Das Museum des Anatomischen Institutes der Universität Wien}, \textit{op. cit.}
mainly and most substantially by Ferdinand Hochstetter, who held the second chair from 1909 to 1932.

**Ferdinand Hochstetter and the modelling of a human archive**

Not much is known about Ferdinand Hochstetter (1861-1954). He was a collector and a traditionalist. In his free time he loved long walks in the Vienna woods. His ethos was that of a *Naturforscher*, dedicated to strict scientific objectivity. As a scientist he was passionate, exact, a pedant. A day before his death, at the age of 93, he sent specimens n°157, 158, and 159 to the curator of the anatomical museum.\(^{20}\)

Hochstetter was born in Hruschau, formerly Austrian Silesia, as a manufacturer’s son.\(^{21}\) He was praised by his obituarist as one of the last members of the famous Vienna Medical School who was internationally renowned and whose pupils of two generations (almost fifty years) were spread all over the world.\(^{22}\) Hochstetter established his international career in the context of the rise of the natural and the biological sciences at the beginning of the second half of the nineteenth century.\(^ {23}\) According to a general trend he was interested in heredity and developmental history – questions that he combined with his early anatomical research in which he focused on comparative anatomy. Internationally, Hochstetter is known for his work on the development of the human brain. All of his research, however, is shaped by his ambition to perfect preparation and visualisation techniques. “The master” of anatomical techniques in the choice of his “material” focussed especially on embryos at all developmental stages but also included animals and fungi in his work.\(^ {24}\)

His milieu or thought collective,\(^ {25}\) the second anatomical chair, was shaped by a descriptive and analytical tradition with the department’s focus on histology, embryology and developmental history, anthropology and folklife studies. Hochstetter was socialised at the Josephinum and like some of his colleagues, who represented an analytical systematic tradition within the Viennese anatomical faculty,

\(^{20}\) Note on the glass container by the custos Konrad Allmer. Cited in HORN Sonia, *Das Museum des Anatomischen Institutes der Universität Wien*, op. cit., pp. 94-5.

\(^{21}\) Ferdinand Hochstetter had been docent at Carl Langer’s institute since 1888. In 1896 he followed Wilhelm Roux in Innsbruck; in 1908 he returned to Vienna and took the second anatomical chair from Carl Toldt. He retired in 1932. Ferdinand Hochstetter, Personal File, MED PA 203/25, Vienna University Archive.


\(^{23}\) Ibid., p. 95.

\(^{24}\) Ibid., p. 96.

he always kept a certain affiliation to the building and its rich natural-historical collections whose atmosphere lived on after the Military Surgical Academy was officially closed in 1871.26 In the visual language of the anatomical atlas that he edited Hochstetter stays in the visual tradition influenced by the model-world of the Josephinum and the baroque aesthetics of its 1780s collection of anatomical wax models, which were carried from Florence to Vienna on the backs of mules.27

Modelling

In the production of anatomical models Hochstetter combined the mobilisation of traditional resources with the most advanced preparation techniques of his time. Wax-plate modelling, which had been popular among anatomists since the 1880s, was done at Hochstetter’s chair as “objectively” as possible: the outlines of structures from slides and microscopical preparations were enlarged and first traced on paper. Then the sections were traced on wax plates as many times thicker than the section as the plane magnification. The excess wax was removed and the cut-outs stacked up and painted in brown or mossy green to transform the layers into an object with a homogeneous surface.28 The work was primarily done by assistants at the department.29 In the finishing stages, the chair cooperated with a small number of designated experts in medical illustration and modelling. Among the members of local enterprises who helped with their technical skills was Franz Stolarzyk, one of “Vienna’s last wax modellers”,30 who in the 1960s would also take care of the Josephinian collection of wax models as a restoration expert.

The models were primarily used as epistemic tools and as indispensable research objects that allowed one to see and understand anatomical details in large magnification. Furthermore, they enabled anatomists to communicate their research results to their working groups at the department and – depicted in drawings and photographs – in print publications. The models were also important teaching aids. Many were equipped with a handle, so they could be studied and eventually shown in the lecture hall. Captions in Latin on the one hand referred to specimens used as raw

26 After he retired Hochstetter had an office in the Josephinum to carry on his research. His predecessor and teacher, Carl Toldt, was also trained in the milieu of the academy.

27 Hochstetter edited Toldt’s anatomical atlas from 1923 (12th ed.). The collection of delicate wax models was bought by Emperor Joseph II from Clemente Susini’s workshop in Florence and in 1785 installed in the newly built Josephinum, housing the military surgical academy.


29 I did not find evidence of women working at the department – but there were regular guest researchers from Japan.

materials and on the other pointed to the anatomists’ print publications, in which they used photographs or drawings of the model to communicate the knowledge of specialists to a small scientific community. This was not new. Anatomical modelling was at all times closely linked to other forms of anatomical imaging. The models in the Josephinian collection were not only made on the basis of dissections, preparations and anatomical atlases, but were also displayed together with drawings that were stored in little drawers under the object. Moreover, the generation after Hochstetter in the 1960s combined 2D and 3D media, built models in coloured plaster and plasticine on the basis of “theoretical forms” and “theories”, after natural objects, micro- or xray-image series that were accompanied by illustrations, “bridging” the gap between the model and “an extreme schema”.31 Hochstetter’s emphasis on models, however, derives from his understanding of them as objective magnifications and thus direct replicas of the dissected bodies.

Collecting

Today the collections, the remains of the old anatomical museum, hold around 80 anatomical models. The majority of these models were made by Hochstetter and his circle in the first decades of the twentieth century and are easy to identify by their shared features: sober coloration in brown, grey or rosé; plain, unornamental, pure morphological, with an extraordinarily high interest in surface and form; self-made stands with descriptive plates attached; rough general impressions. The institute was committed to a descriptive tradition, free of every interpretative speculation, aiming at reaching a truth resistant to any doubts.32 The models are largely based on questions in the feetal development, picturing the development of the gastro-intestinal system (Figure 2), the brain and the face.

Besides that, Hochstetter’s legacy, one of the largest anatomical-embryonic collections of his time worldwide, unfolds his obsession: a collection of anatomical slides, a collection of anatomical preparations, a collection of photographs of embryos in different developmental stages, drawings after nature or after microscopic slides. These media were important objects themselves to enable the study of anatomical details at high magnification (e.g. the “exterior” of face, limbs, and brain) and even more valuable as the raw material for modelling.33

The applied aspect of this virtue was formed by a methodological approach. For example, Hochstetter developed methods to display subminiature hollows and

32 PERNKOPF Eduard, Ferdinand Hochstetter, op. cit., p. 96.
33 Slip box-catalogue (footnote 19); PERNKOPF Eduard, Ferdinand Hochstetter, op. cit., p. 96. HORN Sonia, Das Museum des Anatomischen Institutes der Universität Wien, op. cit.
burrow systems, a preparation method in which he led a little crab do the work of exposure of an embryonic skeleton, and a method of paraffin-impregnation that allowed him to preserve plants and animals in their “natural appearance”. In general, exact examination and measurement dominate the visual language of Hochstetter’s media, which again refer to dissection (picturing nothing but what is visible on the dissection table), collection, systematisation and the perfection of registration techniques. Here, he combines the nineteenth century fascination for creating a human archive with the virtue of mechanical objectivity and exact depiction. Intermedial references and references to the specimen used in the form of descriptive text provide information about the production of the models and in doing so they prove the credibility of the objects.

Dissection played an important role in Hochstetter’s visuality – he showed dead or (in his atlas book) even half-dead people – and methodology. The epistemic virtue guiding his research was the display of “ideal” material, meaning only “fresh” and “immaculately conserved” embryos, that he received immediately from surgical interventions (postmortem alterations started within two hours) by his exceptional network, comprising over a dozen of professors, chief physicians and medics. The comparison of embryos of the same age guaranteed the best results. Damages caused during preparation were later eliminated in visual representations.

Processes of Segregation in Anatomical Modelling

At the same time, anatomy in the late nineteenth and early twentieth centuries, but especially during WWII, developed into a field that was shaped by the construction of different “non-academic” areas: by biopolitical administrators of the “Humankapital” who aimed at organising the reconstruction works, by hygiene educators and health politicians who needed to communicate knowledge about the healthy and the pathological human body easily to the masses, and by exhibition and fair organisers who integrated anatomical images and objects into their repertoire and reframed them in correspondence to their economic and socio-political ideas.

34 PERNKOPF Eduard, Ferdinand Hochstetter, op. cit., p. 96.
35 Ibid.
36 Ibid.
37 HOCHSTETTER Ferdinand, Beiträge zur Entwicklungsgeschichte des menschlichen Gehirns, Wien, Deuticke, 1919, preface.
38 Ibid., 4. Only one out of 75 embryos Hochstetter had collected for this publication was obtained from an abortion.
39 In the past decades the history of the hygiene movement in the 1920s and 1930s with, for instance, the work of the Hygiene Museum in Dresden and the popularization of “scientific knowledge” at international health and hygiene fairs (Hygieneausstellung, Vienna 1925; GESOLEI, Düsseldorf 1926; Internat. Hygiene Exhibition, Dresden 1930/31) has been the subject of substantial research. See KÖRNER Hans (ed.), Ge So Lei, Kunst, Sport und Körper: 1926-2002, Ostfildern-Ruit, Hatje Cantz, 2002; LEPP Nicola (ed.), Der Neue Mensch, Obsessionen des 20. Jahrhunderts, Ostfildern-Ruit, Hatje Cantz, 1999.
Hochstetter was clearly skeptical concerning this development. Both his models and his other media of anatomical visualisation show a high resistance to alternative uses to the strict research context. Making the models as simple and unadorned as possible was not only a way of increasing their scientific value, and a declaration of their purity as nothing but scientific tools; the aim of the strict academic visuality was also to show decisive resistance to the growing popularisation and politicisation of the life sciences.

But how was it possible that the call for an applied anatomy, an anatomy interested in function and fitting into clinical applications, was ignored at Hochstetter’s institute? How could the call for a sociomedical responsibility that was asked to be taken by anatomists go unheard, especially in the context of the social tensions in interwar Vienna, which was characterised by a growing radicalisation of broader societal fields?

The answer lies in the specific organisation of local milieus that were structuring anatomical modelling. Given the understanding of the depiction of the human as a cultural practice it is not surprising that anatomical models, used in research and teaching, which represent an academic approach and propagate notions and media politics are in fact very strategic objects of knowledge. In the first part of the paper I have described the local density of a dichotomously organised anatomy in early twentieth century; the two institutions were housed under the same roof. This separation, together with the increasing scientific and socio-political segregation of the two institutes, led to the development of two approaches and two distinct directions in anatomical modelling. My claim is that Hochstetter was able to turn towards an “internalistic” form of anatomical modelling exactly because clinical-health-political and pedagogical-public-educationary projects were represented to an outstanding extent by the first chair.

Palm-sized anatomical models of teeth are rare legacies of the first anatomical institute that saw itself in the succession of Josef Hyrtl’s artistic tradition. A wooden box with slots, each large enough for a model of an enlarged human adult’s tooth, the idealised character underlined by a well-covering white coating (Figure 3).

In the course of his career, Hochstetter’s opponent on the second chair, Julius Tandler (1869-1936), was successively more health politician and reformer than anatomist.40 Powerful and convincing objects for him were key elements of a

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40 Tandler was a professional in “science popularization” and a left-wing politician. In 1917 he worked in the newly founded imperial ministry of public welfare, briefly was national undersecretary of public health in the new government. When two years later the coalition fell and socialists lost influence on a national level, Tandler changed to the city of Vienna where the socialists would be the leading force for over fifteen years. Tandler became municipal councilor of health and welfare and shaped reforms that affected the health and wellbeing of families and youth in a capital city devastated by war. Further, he was education advisor for the socialdemocratic party in Vienna, active in the temperance-movement, and freemason. In his research he focused on constitutional science and comparative developmental
socialist reform movement and the central element of a utilitarian vision. The shaping and design of the models and their use in a field that understood anatomy as part of health education was, for Tandler, the same mission. In a clear, ornament-free, functionalist visual language, the models deriving from his milieu show the average, typical tooth. The epistemological background of these models is not primarily dissection and understanding little details of human development on the basis of a designated embryo, but the display of the normal healthy individual as part of a group, as part of the societal whole.

With this approach, Tandler in his models repeats what he started in his non-anatomical activities. His war experiences and contacts with socialist eugenicists and philosophers led him to his biopolitical concepts. The administrator of the “organic capital” of society, as he understood himself to be, was a main proponent of diet kitchens, the development of school dental care, and the development of a perspective that was directing anatomy and its objects to the control and the reform of the living. His milieu was not modelling for the academic elite, but for the clinician and the new man – a healthy secular social individual coming from a multi-ethnic working class background. Consequently, in the models of Tandler’s milieu, for example in a teaching torso of 1910, \(^41\) we do not see the cutting open of a dead individual but the x-ray through a living person, from birth to death informed and monitored by the newly established health system of Red Vienna.

The authorship and exact production procedures are of minor relevance when the social is displayed in the model, the perspective for a better future society that aims to prevent people from getting sick by making knowledge about the body accessible and transparent. \(^42\) In contrast to the better known anatomical functional models *Der Gläserne Mensch* of the Hygiene Museum in Dresden, however, in Vienna models were not produced as financially lucrative export goods. Neither at the Gesellschafts- und Wirtschaftsmuseum (GWM), where Tandler was the consultant for health and medicine, nor at the more popular Präuscher’s panopticum, \(^43\) similar

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41 Female Torso, anatomical model (1910) inner organs can be obtained individually. Technical Museum Vienna, Inv. Nr. 68871.

42 Tandler’s milieu aimed at developing a universally understandable language to unite above language and class differences. Models here were used as intellectual and social-political tools to propagate the idea of a reformed life.

43 Präuscher’s Panoptikum und Anatomisches Museum (1871 to 1945) was the only long-range open anatomical museum of the city. The former animal trainer Hermann Präuscher took the business over from his father in 1860. His motivation to display anatomy was to unify human kind with the rest of godmade nature – and to make this knowledge accessible to anybody, beyond university dissection classes. However, the museum was based on university collections: wet and dry preparations, bones,
expensive and professional models were produced in series. In Viennese hygiene exhibitions in general, graphics, first aid manuals, hygiene films and brochures, which were much cheaper to produce, were preferred.44

It seems surprising that despite Vienna’s traditionally close link between medicine and art schools, a rich visual tradition in medicine, local craftsmanship, and outstanding collections45 did not lead to a professionalised form of modelling. However, as archive material reveals, there were in fact attempts to bundle and institutionalise local expertise in artistic medicine that then found an end in the financial misery of the post WWI era.46 Around 1908, Alphons Poller, head of the Moulage Institute located in the Medical Quarter, worked hard to convert it into an Institute for Applied Medicine and Artistic Anatomy, and temporarily succeeded. Poller was experienced in manufacturing protheses and teaching aids and like the Hennings, father and son, he at first made his living mainly by producing medical moulages for different clinics, when health and hygiene education still fostered the popularity of this medium.47 Poller in conversations with the Ministry of Education promoted the idea of putting the cooperation of students from both medicine and the arts, which was active at his institute, “to the benefit of both sides” on an institutional ground. After WWI, however, resources were scarce and the Ministry finally cut the funding and forced Poller to make his living by modelling for the Vienna Police before finally moving to Germany.48

Concluding remarks

When Tandler’s family, an impoverished Jewish merchant family, in the late nineteenth century, like many others, moved from Moravia to the capital of the
century

RATHKOLB Oliver (ed.), antisemitischen Attacken am I. Anatomischen Institut der Universität Wien, 1910 bis 1933”, in

Austro-fascist into Tandler’s in times of radicalization.

Like Brühl, Julius Tandler saw himself as a representative of a “modern” – in the sense of a practical and applicable direction, and as an engineer of society, and thus in his media he, more than Hochstetter, emphasized a sober, schematic visuality.51

Finally, the two diverse anatomical milieus had not only their local resources and places within the city, but also their international networks: while Hochstetter’s second chair had a strong orientation towards the German scientific community and more conservative societal circles, the health politician Tandler linked his chair to the League of Nations and international health reform programs. For Hochstetter modelling was part of collecting – and meant conserving. Tandler’s models are actors in a future-driven design process, fighting for cosmopolitanism and humanitariarism in times of radicalization.52

The close link between anatomy and politics in interwar Vienna explains why Tandler’s political health perspective barely survived physically in the form of models into today’s collections. When he, as a social democrat, had to emigrate under the Austro-fascist conservative government in 1934, his institute was closed. The

49 The idea that anatomical collections should not be reserved to students and researchers was not new but depended on actors’ interests and assumptions of anatomy and as archival material shows, opening hours and the accessibility to the public were debated (Collections of the Medical University of Vienna, MUW-HSK-04048-007). Tandler propagated the opening and when his assistant in 1924 took some duties at the museum it was renovated and made accessible for the “general public” in summer on Tuesdays and Fridays from 11 to 12 am and 2 to 4 pm; Sundays from 10 to 1, in winter only on Saturdays and Sundays (University Archives, Anatomisches Institut, Mappe 2, 35).


51 Tandler defines medics as administrators of the “organic capital” of a society. TANDLER Julius, undated note, Tandler Estate, held by Karl Sablik, Spillern, Austria.

collections of his institute were reportedly brought to Sivering, a wine-growing village in the suburbs of Vienna, where the trace ends. However, Tandler, in the course of his travels and his activities in international health programs and associations, was invited to Moscow, Istanbul and Shanghai, in order to assist in the building of anatomical institutes and collections according to the “Vienna model”.

For Ferdinand Hochstetter, the anatomical museum in Vienna represented not only the central storage rooms of his working objects but it gave his institute and his standing within the scientific community a material backbone. He enriched the museum in a way that was different from that of modernisers and popularisers in the field of anatomical imaging: he did not group functional working units. In contrast, he continued the morphological-descriptive interest of his predecessors and expanded their activities with a focus on models. In addition, however, he developed a visual praxis for the models that refrained from any ornamental art – and he did this in parallel and in a polemic opposition not only to popular approaches but also to the traditional opulent aesthetics of naturalist representations that were so typical in anatomical depiction.

When on 7 February 1945 a large part of Hochstetter’s collection was destroyed in the course of the bombing of the anatomy building, the world he had tried to conserve so obsessively vanished to some extent too.\textsuperscript{53} His objects that were to my knowledge all prototypes, however, had a vivid afterlife in print publications and – through his network – in other university collections that today show traces of their dissemination.\textsuperscript{54} In addition, his models were later translated into a teaching aid series by the German enterprise Osterloh and were sold worldwide.\textsuperscript{55}

\textsuperscript{54} Photographs of models, specimen and sketches are found in Heidelberg, Basel, and Japan.
\textsuperscript{55} Like Friedrich Ziegler in Baden, Osterloh in Leipzig turned photographs, descriptions and wax-platter models (raw prototypes like the ones produced at Hochstetter’s department) into effective visual aids that were reproduced and sold worldwide; the construction process was normally supervised by a reknown anatomist, whose name stood for scientific accuracy. Based on reconstructions of Hochstetter's Embryos Ha4, Li1, E10, No1, Ha3, Peh2 und Ha9 Osterloh produced a series on the development of the brain. For their dissemination see www.universitätssammlungen.de (last retrieved 10.9.2013)
FIG 1, Ferdinand Hochstetter surrounded by students and assistants of the second anatomical institute.

FIG 2, Models of the development of the gastro-intestinal tract with handle-bars and descriptions (one model broken).

FIG 3, Models of adult teeth.