Medical Anamnesis

Collecting and Recollecting the Past in Medicine

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▼ ABSTRACT This paper suggests that the practice of anamnesis—the taking of a patient history in preparation for making a diagnosis, as well as the related form of investigation, historia—offers a way to understand the role of medical collections in generating medical knowledge. Anamnesis derives from ancient Greek “recollecting” or “opening of memory,” and “taking a history” from historia, an ancient and early modern epistemic practice of gathering empirical observations from the past and present. Doctors and medical researchers perform, this paper argues, a form of anamnesis when they access collections—of pathological organs, experimental animals, diagnostic slides, samples, and data—and the collections may in turn be seen as constituting institutional and disciplinary memories. It moreover shows that doctors and medical researchers in their work with collections negotiate two ways of organizing observations that are also present in an anamnesis. One way clusters and classifies observations, while the other traces developments and requires significant past observations to understand the present. This double nature plays out in different ways in different historical collections. Last, the paper itself may also be seen as performing an anamnesis: looking for patterns and tracing a development in medical history. It “opens the memory” of medical collection practices, and shows that medicine is past-heavy and that the past plays a central role in modern biomedicine. Anamnesis is thus used as a historiographical stance that seeks to understand present practices of generating knowledge about diseases through an inquiry into the past.
Introduction

An anamnesis or “taking a history” is a practice where a doctor inquires, not only into a patient’s immediate complaints and symptoms, but also into their past and the history of their symptoms. This history may reveal particular clusters of symptoms or a recognizable development over time that again point to probable diagnoses and further investigations. The term anamnesis derives from Greek: the prefix aná- means “up,” “back,” or “re-“; and the word mnēsis means “memory.” So anamnesis literally means opening up memory or recollecting. The practice is also referred to as “taking a history,” likewise deriving from the Greek where historia means “inquiry,” particularly one based on observation and accounts of events.

What particularly interests me here is that the practice and terminology of anamnesis and of “taking a history” point not only to the empiricism of medicine, but also to the temporal and historical nature of disease and medical knowledge. Diseases have pasts that are necessary and relevant to understanding them, in more than the trivial sense that all phenomena have a past. Medical practice interweaves current observations with observations from the past to both classify diseases and track their developments over time.

In this paper, I suggest that the practice of anamnesis and the taking of histories can be conceptualized as capturing two aspects of collection use in medicine. First, medicine draws heavily on its history and on material collected from past patients, and this material is continually used and reused to understand diseases as new questions emerge. Second, the understanding of disease is characterized by a double interest in, on the one hand, observing and classifying, and, on the other, tracking temporalities and disease courses. Anamnesis both clusters symptoms and looks for developments, and this tension is evidenced in modes of organizing collections of bodily material as well as in the interpretation of disease data in contemporary medicine.

To expand a little on the first, historical aspect, collections of case histories and human bodily material preserve past patients and diseases, and these collections may be viewed as a working memory for medicine. Despite modern biomedicine often projecting an image of futuristic laboratory science, the dependency on the past is, as we shall see, becoming increasingly significant in modern biomedicine.\(^1\) Collections

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\(^1\) Biobanks often focus on the future rather than resources from the past, though much of their strength lies in older samples. The project Diet, Cancer and Health by The Danish Cancer Association traces connections between diet and cancer through collected samples and data. It presents its “next generation” collection from 2017–2019 as a “population study for the future,” rather than focus on the important earlier set of samples taken in early 1990s: Kræftens Bekæmpelse (n.d.). UK Biobank shows a robot accessing endless shelves on the front
of material from bygone patients are needed to generate medical knowledge and diagnostic categories, and drawing on them constitutes a form of anamnesis at a disciplinary level. Instead of opening the memory of just one patient, it opens the memory of the discipline in the shape of collections.

So the past is activated in several ways in medicine and history of medicine, and this is captured by anamnesis operating at several levels in this paper. The starting point is the standard medical practice of anamnesis where doctors collect the patients’ recollections and combine them with their own observations. Then—in a second-order sense—anamnesis is used to capture the way in which doctors and researchers collect specimens and case histories to generate general disease categories and trajectories. Last, the historical investigation in this paper, may itself be seen as a third-order anamnesis digging into the memory of medical history to map and show a development in collection practices, and to use them to understand features of modern medical and biomedical knowledge. These layers of anamneses are all intertwined in medical practice and in our understanding of disease. Doctors gather knowledge from patients when taking anamneses. But they can only assign diagnostic categories to patients because these have already been formed on the basis of the “memory” of historical specimens and samples, which are again constituted by individual anamneses. And both the individual and the disciplinary anamneses are part of a longer historical development where new collections and recollections of the past shape longer-term reconceptualizations of disease.

Moving on to the second aspect of anamnesis and historia, they are, as noted above, characterized by a tension between classification and temporal development. Classifying requires observations or objects to be on a level field where they can be compared and grouped into categories. Sequencing, on the other hand, establishes a continuous differentiation in time within a category. Nevertheless, the doctor’s anamnesis and examination of a patient look for both: patterns of similarity and progressions in time. As we shall see, medical collections are similarly concerned both with searching for categories of disease—clustering, and classifying—and with tracing the development of the disease over time. In effect, medical collections combine a scientific timelessness—synchronicity—with the history, development, and natural history of disease—its diachronocity. So while diagnostic categories name
diseases and are often associated with conceptual boxes for understanding diseases as entities, inquiry into time dependence and the understanding of how diseases begin, develop, and end also play increasingly important roles in establishing similarity and difference.\(^5\)

The specific collections that this paper's anamnesis opens and examines derive from the late 18th to 21st centuries, and they present different ways in which the memory of medicine is ordered and reordered. After expanding on the prehistory of anamnesis and historia, the paper begins by suggesting that pathological collections are characterized by a flat time or timelessness, where all the specimens are collected at death and the development of disease is attached in the form of case notes that complement the collections. It then considers a case of the experimental production of pathological specimens that allowed researchers to themselves generate disease, with an examination of microscope slide collections that made it possible to trace the development of diseases. Last, it presents how current research projects combine classification and development of disease by sorting disease-courses into categories. In their different ways, these collections all draw on histories of past patients as well as manipulate temporalities by comparing old and new: They map the landscape of disease and trace temporal trajectories through it.

Gathering disparate collection practices from the 18th to 21st centuries under the heading of anamnesis may be regarded as a conceptual stretch, and it certainly makes it hard to delve deeply into the context of each historical episode. The term anamnesis is key here. A historiography based on anamnesis inquires into the past, but simultaneously aims to understand the present state of medicine. In this it differs from traditional historical research that often restricts itself to investigating diseases only in their particular historical contexts, and that strives to be independent from present concerns. The historiography of anamnesis, however, also differs from accounts that interpret the past in light of fixed, modern views of disease; it does not impose notions of disease on the past. In the spirit of the practice of anamnesis, this way of writing history regards the present not as known and fixed, but as an object of investigation. It examines present and past practices in light of each other.\(^6\) This paper is thus engaged in understanding both how medicine is deeply dependent on past collections and how medicine related to its past collections in the past.

**Anamnesis and Historia**

Before approaching the specific collections, it is worth exploring past and present uses of the terms anamnesis and historia in a little more detail and thereby giving a sense

\(^5\) On the historical development leading to specific disease entities, see Rosenberg (2002); Silverman & Rosenberg (2013).

\(^6\) Although I take my departure in the present, I hope to avoid simple anachronism or biological essentialism by allowing the past and modern concepts of disease to inform each other and by staying as open as possible about both. For discussions of constructivist stances of history of medicine relative to the biological essentialism of retroactive diagnosis, see Cunningham (2002); Stein (2014).
of their depth and breadth. They both have histories that extend well beyond their role in medical practice and that go much further back than the practices considered in this paper. The multiple meanings found in the early uses of the terms, however, inform their later uses and still resonate in the terms.

Anamnesis is first and foremost a concept in Plato, who unfolds it in his dialogues *Meno* and *Phaedo*. Taking *Meno* as our example, Plato lets his protagonist, Socrates, demonstrate that learning is a form of recollection. In the course of the dialogue, Socrates enables a slave-boy to establish the Pythagorean theorem without teaching it to him. He assists the boy in accessing what he already knows and—acting as a midwife—brings the knowledge forth. Plato’s puzzling claim here is that all our knowledge is already lodged in our memories at birth, and when we think we learn something, we actually retrieve it through *anamnesis* or recollecting. While debates about the nature of knowledge need not concern us here, we can note the powerful idea from Plato’s account of anamnesis, that a teacher through guided dialogue can assist a person or patient to become conscious of knowledge already present in them. Memory and the past are central constituents of knowledge. This idea of anamnesis lies at the heart of the doctor’s dialogue with the patient to bring out the history of their disease. And also, I argue, of the synthesizing of medical knowledge from collections.

The modern practice of anamnesis took form by the bedside in 18th and 19th century medicine, and is still taught at medical schools and practised in doctors’ surgeries. When taking an anamnesis, the doctor listens to the patient to hear what their symptoms are and how they developed. The doctor may also prompt the patient to talk about their background, social situation, family medical history, as well as diseases they have previously suffered from—preferably with very little input from the doctor. Manuals often emphasize that the doctor should avoid drawing conclusions too fast. A strategy in the diagnostic process can even be to wait and see how the condition develops. In addition to taking the anamnesis, the doctor also observes the patient and conducts a physical examination looking for signs of disease as well as order laboratory or other diagnostic tests. Finally, the information gathered may reveal a pattern or development that points towards a diagnosis. The diagnostic process thus triangulates between the anamnesis that uncovers the patient’s history, the observation of signs of disease, and laboratory investigations: history, observation, and analysis.

Turning now to *historia*, this related set of epistemic practices is concerned with empirical investigations of nature, culture, and the past. Most famously, it figures in the title of Herodotus’s *Histories*, and although the ancient Greek author is often presented as the world’s first historian, it is also a commonplace that *historia* in Herodotus’s title means “inquiries” rather than “histories.” In line with this broader remit, the work contains a synthesis of investigations covering geography, ethnology, myth, and history. The purpose of Herodotus’s collection of observations and

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7 The process is outlined in textbooks on how to conduct an anamnesis or work on how to improve the diagnostic process; see Saxtrup (2019); Mengel, Holleman, & Fields (2002); Balogh, Miller, & Ball (2015).
accounts from the past was to explain the condition of unrest between Greeks and barbarians. Herodotus was thus concerned with a political rather than bodily malaise, but both his method and observations have been noted to resemble the Hippocratic medical treatises. Herodotus shares, for instance, an empirical stance based on sense perception, evidence, and autopsy with the Hippocratic *Epidemics*, which comprises 42 accounts of courses of disease as well as descriptions of climatic conditions. Both Herodotus and the Hippocratic writers closely intertwine investigations of health, environment, and history, and the empirical approach to past and present is a hallmark of the genre. In the case of the Hippocratic doctors, the knowledge of courses of disease helped them recognize patterns and orders of symptoms, and then, when they encountered the pattern in a new patient, they could suggest symptoms that the patient had experienced but forgotten to mention, as well as prognosticate into the future. Histories were thus key to ancient doctors’ expertise.

*Historia* emerges again powerfully in the early modern period when it became an important mode of inquiry focussing on real things and true events—or observations and developments. Gianna Pomata and Nancy G. Siraisi’s edited volume maps the breadth of *historia*, which covered both historical events leading up to a present situation—sometimes called *res gestae* or “deeds done”—and empirical accounts of natural history and medicine. In Pomata’s contribution, she notes two distinct genres of *historia* in medical treatises. They both report direct (and indirect) observation, but one deals with the body, and the other with courses of disease. The former, “anatomical *historia*,” offers careful observations of dissections. The latter, “medical *historia*,” reports individual courses of diseases following in the steps of the Hippocratic treatises. The early modern period thus saw developments in medical writing under the heading of *historia* that encompassed both careful observation during dissections and early case histories tracking of development of disease in patients—with both genres drawing on past records and data. *Historia* could thus refer both to synchronous observations and diachronous accounts of key events and developments—both to anatomy and the development of diseases.

In the course of 18th century, scholarly practices of compiling case studies developed into classifications of disease. The French physician Sauvages produced an early nosology—classification of disease—on the basis of compiling and collating observations from the past and from the bedside. Volker Hess and Andrew Mendelsohn analysed his textual practices and convincingly re-evaluated his notes. Where previous scholars saw a “pot pourri,” they saw the “crowning achievement” of the tradition of *historia* resulting in generalized disease groups. Hess and Mendelsohn ascribe the establishment of general disease descriptions to the scholarly practices of *historia* rather than to the clinical practices of Paris hospital medicine. In what follows, this paper combines the links to hospital medicine and to *historia* by focusing both

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8 The Hippocratic corpus consists of around 60 treatises attributed to Hippocrates, but written by several authors. For parallels between Herodotus and Hippocratic work, see R. Thomas (2000); Lateiner (1986); Lloyd (1979); as well as Schiefsky (2005) on Hippocratic arguments against the use of natural philosophy in medicine.
10 Hess & Mendelsohn (2010; 2014).
on collections of bodily materials (which took off with hospital medicine) and the practices of anamnesis and historia.

Coming into the 19th century, Mendelsohn writes on how disease categories were established on the basis of cases, emphasizing the central role played by library collections of case descriptions. He recounts how he attempted to pinpoint a “first case” of a typical condition of internal medicine, but was frustrated to find no paradigmatic case. Instead, Mendelsohn found that the naming of a condition was the result of a process of clustering older case descriptions, sometimes going back several hundred years. As he writes, “[b]etween observing and knowing stood a library.”11 Such collation of old material is also what I focus on, but I extend it to physical collections of specimens, where clustering of cases—a form of “re-collection”—similarly led to categorization and understanding of the development of disease. Interestingly, Hess and Mendelsohn themselves indicate a relation between the paper-based scholarly practices of Sauvages and material collection practices when they use material metaphors to describe how Sauvages established and adjusted his nosology. In their metaphor, the cases of disease are like “beetles” placed in “boxes” of disease categories, and Hess and Mendelsohn thus associate the construction of the classification of disease with material collection categorisation. Both libraries and collected samples make up material memories that allow doctors and researchers to conduct a form of anamnesis that generates diagnostic categories.

With this whirlwind account of the background of anamnesis and historia, I have indicated the complexity of the traditions, and it should be clear that the connections between modern medical practice and these concepts are complex and multiple. The following is, in accordance, not an attempt to establish direct historical connections between contemporary and ancient or early modern medical practices. Rather, it notes the resonances of the terms to highlight processes of combining observation and investigation of past cases and of synthesizing past cases into categories. On this background, I now consider how the process of forging disease categories out of collections is a form of anamnesis or historia.

Collecting and Recollecting in Medicine

Medicine may—as I have argued elsewhere—be regarded as a collection science.12 As Bruno Strasser showed with respect to natural history and biology, collections did not disappear from medicine or biology with the rise of laboratory science, and biomedical research today relies on collections of blood, tissue, health records, and genetic data.13 Medicine’s history as a collection science stretches from the late 18th century, when collection began in earnest, to the present. Sketching the history briefly, collections of gross specimens were formed in private collections, universities,

11 Mendelsohn (2017, pp. 85–86) provides an alternative or perhaps rather an addition to the classic histories of Foucault (2003) and Ackerknecht (1967), which focus on the changes forged by Paris hospital medicine.
12 Tybjerg (2015; 2022) on medicine as collection science.
13 Strasser (2012; 2019).
and hospitals in the 18th century and vastly expanded in the 19th century. These collections were first supplemented and later supplanted by microscopy slides of tissue in 19th and 20th centuries, and by frozen blood and tissue samples in 20th and 21st centuries. In the last 15 years the latter samples have been gathered in large-scale, dedicated biobanks, demonstrating the continued importance of collections.

Medical collections often started with the work of a single doctor or researcher or a small group who gathered their experience and research material in personal or local collections. Later, such collections were compiled into bigger, institutionalized collections. Collections thus shifted from constituting a personal record, memory, or materialisation of experience into an institutionalized memory. They also often changed in focus from diagnosing and investigating single cases to categorizing large numbers of specimens through sameness and difference. In this way, the work on collected material shifts from a practice related to clinical anamnesis—single practitioners investigating individual patients—to a collective work allowing the construction of generalized disease categories. This is what I term “second-order anamnesis”—different from the clinical one—as it concerns cohorts of patients and reprocesses material already collected. The work with collections also combines anamnesis and physical examination as it relies on both records and the analysis of physical material from patients. It thus generalizes the practice of observing and opening a memory to gain knowledge of disease classification and progression.\(^\text{14}\)

Another important feature of collections—which consist of specimens, case notes, samples, and data—is that they, like memory and records from the past, allow material and observations to be compared across time. Material from former patients from decades or even hundreds of years ago can be placed side by side with current material, and classified or placed in a sequence. Such collection work may, as stated above, be seen a process of anamnesis or recollection—a grouping, ordering, juxtaposing, and reorganizing of previous experience together with new observations.\(^\text{15}\) Such practices thus extend the empirical work of medicine across time and also allow re-purposing of collections, for instance through utilizing samples from the study of heart disease to investigate breast cancer, or by consulting diagnostic biopsies to create techniques for general long-term prognoses of liver diseases.\(^\text{16}\)

Below, I consider collections from the last 200 years, and ways in which the past has been recollected, created, or even waited for, in order to understand disease.\(^\text{17}\) The tension between categorizing and tracing the development of diseases is played out in different ways in different collections, and the change may be associated with a shift in the temporal aspects of disease across the period. While disease in the

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\(^{14}\) Both archives and museums are likewise connected to practices of memory combining personal and historical memory; see, for example, Crane (2000); Foote (1990).

\(^{15}\) N. Thomas (2016) emphasizes the possibility of reorganizing and juxtaposing materials in new ways as one of the central epistemic strengths of museums and collections.

\(^{16}\) Bauer (2008); and the research project Data for Good Science (also considered later in this paper): Tranberg (2021).

\(^{17}\) With a past being ”waited for,” I refer to collecting samples and then waiting for diseases to develop (or not) in the group of patients from whom the samples were collected.
early part of the period was often of relatively short duration, with patients coming
to medical attention only when the disease was far progressed or terminal, disease
today is more frequently of longer duration as it is both detected earlier and treated
better, and chronic diseases dominate the picture. These longer courses of disease
have consequences for how the collections are used, as tracing diseases over longer
time-spans requires digging deeper into the medical past.\textsuperscript{18}

\textit{Classification and Catalogues in Pathological Collections}

Starting with the pathological collections, these developed—as noted—from individ‐
ual doctors assembling small, private collections constituting a material record of
their own experiences, to institutions like hospitals or universities amassing a profes‐
sional memory across several generations of doctors.\textsuperscript{19} This resulted in collections
that extended beyond individual experience and mapped a varied pathological land‐
scape from which generalized categories were clustered. Pathology as a discipline was
made possible by the disciplinary memory of the collections.

In the preparations, pathological lesions were isolated from the bodies they were
part of, thereby strengthening the notion of diseases as entities.\textsuperscript{20} The lesions literally
provided material stills of diseases, and being—almost by definition—taken at death,
they fixed and identified diseases with their state at death. Once specimens were cut
out of the body, they were also cut out of time—and out of the development of
the disease. The collected specimens were thus taken at the “same” time, at death,
no matter when they were prepared. This made them eminently comparable, but
weakened their connection to the development of disease.

In collections of pathological organs, the specimens were thus predominantly
classified according to a “flat” time, where the specimen represented conditions and
diseases with no time dependency. They were organized anatomically according to
regions or systems in the body—that is, divided into diseases of the lung, brain, liver,
and so forth, or of the nervous, respiratory, or digestive systems. Within these groups,
a frequent mode of describing and classifying specimens was by deviation from the
norm: by deficiency or excess (being smaller or larger than normal), by difference in
form, by difference in appearance (for instance, inflammation), by malignancy, and
so forth.\textsuperscript{21} Such division indicates a process or development from the normal to the
diseased state.

\textsuperscript{18} Tybjerg (2022, pp. 227–229) notes how the moment of diagnosis changed in the period between 1800 and
the 21st century: from taking place close to death (at autopsy), to being identified during the early onset of
symptoms or even before. Aronowitz (2009) points to still earlier detection of disease and the rise of pre-disease.
\textsuperscript{19} Alberti (2011, Ch. 2).
\textsuperscript{20} For the material process of carving out the lesions as a way of manufacturing disease entities, see Tybjerg (2022);
for the shift from being a part of a person to being a preparation representing a disease, see Alberti (2012);
for the historical process of rendering disease into entities separate from the patients—disease specificity—see
Rosenberg (2002).
\textsuperscript{21} Alberti (2011, pp. 138–142) describes, for instance, the arrangement found in Hodgkin’s \textit{Catalogue of Prepara‐
tions}. This mode of classification may also be inspired by earlier symptom-based nosological categories that were
A development of diseases or malformations was thus present in collections, but
subsumed under the anatomical classification of disease. Such anatomical temporality
is also found in teratological collections, such as the the Saxtorphian Collection at the
Medical Museion in Copenhagen. Here, Matthias Saxtorph (1740–1800) sought
the origin and path of malformations in the anatomical structure of pathological
specimens. In an article concerning two malformed infants with their intestines
hanging out of their abdomens, Saxtorph found both similarities and a series of
steps in their deviation. This indicated to Saxtorph a path in the development of
the malformation. The collected infants thus fixed the malformation as a category,
but also showed a path or development towards it. Saxtorph concluded that: “such
malformities demonstrate, when one compares several of a similar kind, that nature in
the essentials follows a certain order, … so that one is able, by regularly collecting and
describing the existing kinds, to track them step by step.”

Development was thus
inherent in, but subsumed under, the anatomical categorization of malformations.
Despite of these ways of inferring temporal development from the static patho‐
logical preparations—which may be seen as “stills” of disease development—the
dominant way in which the temporal aspects of disease were connected to the
categorized collections was through catalogues, which often contained case histories
describing the symptoms and courses of diseases as well as descriptions from the
autopsy. These thus added a history or anamnesis to the classified specimen.
The collection consisting of both catalogue and specimens thus mirrored the classical
consultation with a patient: the case history offering an anamnesis by recounting what
came before, and the specimen allowing the disease to be observed like the body is
during a physical examination or test.

The collections thus constituted a professional memory that combined the classi‐
fication of timeless specimens with their accompanying case histories that traced the
diseases through time. In this way, they combined the two distinct genres of historia
from the early modern period: anatomical historia that offered careful observation
of dissections, and medical historia that accounted for courses of disease. These
two genres merged in pathological collections and their catalogues: the collection
anatomically defined the disease as fixed at death, while the accompanying case notes
offered histories of symptoms.

**Crossing Time and Categories in Virchow’s Pathological Collection**

In the second half of the 19th century, surgical treatment options improved drastically
and microscopic slides allowed the study of disease processes at the cellular level. This
meant that doctors had both an increased motivation to study the gradual progression

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22 Saxtorph (1799, p. 115).
23 See Alberti (2012, pp. 154–159), on the contents and essential roles of archives and catalogues in 19th-century
British pathological collections.
24 Pomata & Siraisi (2005); Pomata (2005).
of disease and a new method of doing so. Rudolph Virchow (1821–1902) worked in Berlin on gross and cellular understandings of disease and studied pathology at both levels. His *Cellular Pathology* from 1858 synthesized attempts to understand disease as pathological cellular changes; and, at the same time, he was an avid dissector and collector of gross pathology, that is, body parts with macroscopic lesions. Having researched the development of disease at the cellular level, he also attempted to display disease processes in his gross pathological collection. Thomas Schnalke, the current director of the Charité medical history museum, describes how Virchow wanted not just to classify, but to focus on the “genesis of these products.”

Virchow’s first display took a traditional form, following his predecessors’ wish to show the organ systems along one axis and types of abnormality along the other (similarly to the collection described in the last section). But in 1899, Virchow managed to create a new display according to his own ideas that added “time sequences” of diseases within the categories (see Figure 1). This involved combining specimens taken from a number of patients who had died with a given disease in different stages. In fact, he prescribed a method of autopsy that examined the whole body so that diseases in their early

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25 Schnalke (2009).
stages—often independent of the cause the death—would be found. So, despite the fact that all the lesions were collected at the time of death, his collection of diseased organs from different individuals meant that he could “recollect” specimens to construct time sequences. The display could thus—like the practices of anamnesis and historia—combine classification with the tracing of disease. They thereby matched the developmental sequences produced by researchers in cellular pathology. As Tricia Close-Koenig has shown for catalogues from the pathological slide collections in Strasburg from 1820–1857, these “bear witness to the natural history tradition in (normal and pathological) anatomy,” that is, to the investigation of developmental aspects of disease.26

Organizing collections to trace origins and developments was not unique to medical museums. Virchow’s attempt to display both a classification and simultaneously to show how diseases originated and developed, was spectacularly mirrored in the contemporary ethnographic displays by Pitt-Rivers at the University of Oxford. Inspired by evolutionary theory, Pitt-Rivers distanced himself from geographical classifications (which might be likened to an anatomical organization) and instead created two-dimensional displays that showed both classifications and incremental

developmental histories, for example, of different types of weapons.\textsuperscript{27} Much like Virchow’s, Pitt-Rivers’s arrangements fitted time sequences into categories—and as in Virchow’s, the development was hypothesized as the weapons were collected at the same time, but arranged as a derivation from a simple form (see Figure 2).\textsuperscript{28}

Pitt-Rivers’s displays of weapons and other artefacts concerned not just the development of artefacts, but also the development of human culture itself. Artefacts were particularly suited for constructing this course of development, Pitt-Rivers argued, as they, being preserved for a long time, enabled him to trace “human culture to its germs.”\textsuperscript{29} Pitt-Rivers presented human knowledge as developing in stages that also seem to mirror the connected histories offered in this paper—and more generally the ways in which \textit{historia} and collection practices have generated knowledge: Pitt-Rivers posited that development starts with an empirical stage; then proceeds to a classificatory stage that generalizes on the basis of resemblance; and concludes with an evolutionary stage that allows a temporal understanding of the development. So Pitt-Rivers materially displayed human knowledge arriving at the evolutionary stage through a practice of collecting and “recollecting” culture.

Drawing a parallel between Virchow’s study of disease development and Pitt-River’s evolution of culture involves a comparison between the relatively short duration of disease in human life and the slow gradual change of cultural evolution. The point here is not to \textit{equate} the development of individual disease with the long-term historical evolution of culture—or indeed with the evolutionary change of, for example, strains of bacteria as mapped by phylogenetic trees. The point of the parallel is rather to highlight that there is a historical element in studies of disease, even if these are not usually perceived as historical, but merely temporal. Moreover, both cases show how histories may be constructed out of items were not originally historically connected: Pitt-Rivers collected items from across the globe and ordered objects from different contexts into developmental sequences, and Virchow combined organs from several individuals to illustrate how diseases develop.

\textit{Diseases in Time and Fibiger's Collections of Experiments}

Like Virchow in Berlin, the Danish pathologist Johannes Fibiger (1867–1928) was a transition figure between organ-based pathology and new methods of understanding the development of disease. His early career combined bacteriological research with clinical work on infectious diseases and a professorship in pathology. His teaching in pathology was traditional, and his textbook was organized as a standard pathological collection with a section on each organ system containing the forms of pathological anatomy associated with that organ.\textsuperscript{30} At the same time, however, Fibiger conducted experimental work that drew on methods and concepts from the study of infectious

\textsuperscript{27} On Pitt-Rivers’s collection and project, see Gosden & Larsson (2007).
\textsuperscript{28} Pitt-Rivers (1906, p. 37).
\textsuperscript{29} Pitt-Rivers (1906).
\textsuperscript{30} Fibiger (1939).
disease and constituted a new experimental approach to the development of disease. This was inspired by the new discoveries of bacteria as causative unit for a number of diseases (such as plague, cholera, and tuberculosis) and the lab practices of generating disease from bacterial cultures in experimental animals. Fibiger began to produce cancer experimentally to understand how it was generated and developed, and thus created its history himself.

While experimental lab-work has been viewed in contrast to collection practices, they were not, as Bruno Strasser also argues in his Collecting Experiments, entirely separate ways of working. Fibiger provides further evidence of this connection with his work on cancer, as he collected specimens showing that cancer can be caused by parasites or tar brushing in rats and mice. Finding large tumours in the bellies of a consignment of lab rats, Fibiger discovered a complex cycle of parasite in rats and cockroaches; and in 1913 he published three papers claiming that the irritation

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31 Strasser (2019).
from the infestation of parasites generated stomach cancer.\textsuperscript{32} He later worked with experimentally inducing cancer with tar brushing. Both processes were painstakingly recorded in pathological specimens that revealed the development of the tumours in the animals, as well as cellular changes over time (Figures 3a, 3b).

The rat and mouse specimens with tumours and the microscopic slides were entered into the collection of the Department of Anatomy and Pathology at the University of Copenhagen, constituting a curious intersection between collection-based classificatory pathology and experimental approaches that manufactured disease development over time. Fibiger's collection of experimental animals were the results of laboratory experiments, but Fibiger preserved and displayed them as pathological specimens. The collections thus became a vehicle not just for categorization, but also for recording changes over time in both gross anatomy and cell samples. In this way, Fibiger could collect the development of disease without Virchow's Herculean labours at the dissection table by working experimentally; and by using animals, he could make the development more fully observable in his preparations and slides. He created a collection capable of displaying the development of the cancer tumours, and included this experimentally produced past in the collected medical memory.

\textit{Staging Diseases and Categorisation in the Clinic}

Over the course of the 20th century, the traditional pathological collections lost some of their centrality as large collections of diagnostic slides tracing the development of disease were amassed at hospitals and labs. In the clinical setting, the focus was on diagnosing (and treating) disease, as well as on understanding increasingly earlier stages of disease and progression over time. In her study \textit{Preventive Strikes, Women, Precancer, and Prophylactic Surgery}, Ilana Löwy shows how the introduction of microscopic pathology changed the approach to breast cancer. As previously stated, patients in the late 19th century did not often see a doctor before their cancer was so advanced that there was little hope of a cure.\textsuperscript{33} Surgical methods, however, began to show some success with small and localized lesions, and this led to a “local to general” notion of how cancer developed, as well as a focus on finding and removing tumours at an early stage. In turn, the curative possibilities galvanized attempts to classify and track cancers and to evaluate treatments and prognoses.

Biopsies and microscopic slides were at the heart of the effort to track cancers. Coming into the 20th century, slides were used to determine whether the cancer was malignant and, increasingly, how far it had developed. The way they were organized reflects their primary role of following disease in specific patients over time, as slide archives were kept at the hospital and ordered according to date and patient

\textsuperscript{32} Fibiger received the 1926 Nobel Prize for discovering a parasite that induced cancer in rats. The seeming success at inducing cancer experimentally ignited hopes of understanding the causes of cancer. The Karolinska Institute, however, later viewed the prize as a mistake, as the tumours were likely caused by a deficiency of vitamin A and moreover some of the tumours were shown not to be cancerous.

\textsuperscript{33} Löwy (2010).
(Figures 4a, 4b). The relation between case notes and specimens thus differed from that present in the pathological collections. The slides were subordinated to the patient file, whereas the case histories in the pathological collections were subordinated to the specimens and the diseases they defined. Taken as tests alongside the anamnesis and examination of patients, the biopsies helped to diagnose and follow up on the development of the disease, and they were saved in case the patient was readmitted or needed to be revaluated. The slides thus did not show the end-point of the disease (at death), but traced its development as it unfolded in the clinic. Indeed, as it was formulated in a portrait of a professor in pathology at Strasbourg, Pierre Masson, histopathologists did not study the “end stage” of diseases, but rather diseases “in motion.”

To understand diseases in motion it was necessary to determine what it meant for cancer to be at a particular stage. Löwy traces this integration of time into the classificatory system along two parallel tracks. One was the development of a clinical classification that resulted in the international system for classification of malignant tumours from 1953, which is still used today and which determines stages according to tumour size, involvement of lymph nodes, and the presence of metastases (hence

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the TNM system: Tumour, lymph Nodes, Metastases). The other system was a research-led classification of cell structures that determined cell type and degree of malignancy. Both presuppose a time progression, with the clinical system tracking the spread from local to general and the histopathological one correlating tissue structure with the developmental path of the tumour.

Comparing disease progressions required new repositories—or more extensive memories of the past—to be created. Cancer registries were first set up locally, for example, in Hamburg and Boston in 1926. Shortly afterwards, national registries followed in the 1940s and 1950s, such as the Danish Cancer Register, which listed all cancers diagnosed in Denmark from January 1, 1943. The collection of data here was explicitly concerned with disease trajectories, and included factors thought to affect progression to enable epidemiological research. One example is the work by the founder of the Danish registry, Johannes Clemmesen, who published on midlife breast cancer and classified two types—one pre- and one post-menopause—by noting a hook shape in the data curve tracking the incidence of breast cancer in late midlife. Here, disease trajectories have become general categories as the pasts of many patients’ trajectories were collected and classified.

Based on the registries, therapeutic actions and their consequences could be evaluated and classified. The registrations may even—and here we are going far back in history—be likened to the sub-genre within historia of res gestae or “deeds done.” Res gestae modelled their accounts on the documents prepared by the emperor Augustus to be read to the Roman senate after his death. They were accurate descriptions of the actions of the past by direct and indirect eyewitness reports, and were intended for future readers to evaluate the success of these actions. They registered a “future past” to enable learning from the history of actions.

**Prognostics and the Recollection of Past Collections**

Today’s biomedicine builds new collections of samples for the future and draws on historical collections in order to understand disease at still earlier stages or as predisease. Particularly when doctors and researchers wish to prognosticate into the future or diagnose a risk, they need collections steeped in the past. Collections thus become particularly valuable as they age, because only then do they allow the full course of disease to be traced, and only then is it known what happened many years after the sample was taken. The old pathological collections of organs taken at death, on the other hand, became obsolete in late 20th century because they revealed little about disease in the early stages. Conversely, newly collected samples cannot tell us much about how a disease is going to develop. So prognostication based on bodily
samples requires researchers to either use old samples or, as described above in the case of cancer registries, to wait for samples or case histories to age. The further into the future researchers wish to prognosticate, the longer they need to wait. Leaving samples to age may be likened to the wait-and-see approach when a patient cannot be diagnosed in the first instance.

Here, I examine two recent projects: one that built a collection and waited for it to age, and one that utilizes past material. For COPSAC (Copenhagen Prospective Study on Asthma in Childhood), a Danish project on childhood allergies, it was a good option to build its own collection as the disease debuts early in life, which means that it is not necessary to wait very long for the disease to manifest. The study, which aims to prevent, diagnose, and treat childhood asthma, follows two groups of children. The first cohort was recruited in 2000, a week into their lives. Researchers, however, realised that this was too late to uncover patterns in foetal life. So, just as the collection was beginning to produce data and the allergies started to manifest, another cohort was recruited in 2010. This time, observations were recorded in-utero from the 24th week of pregnancy—a longer past that could make even earlier intervention possible. In addition to blood samples, the study collects samples from nose, skin, and faeces, and maps genes, proteins, and more. It also traces the disease clinically, registering clinical history, measurements, tests, diagnoses, and even randomized controlled trials of different interventions. The categories of disease produced by COPSAC thus incorporate several time dependencies in their classifications: histories of symptoms, experimental approaches, stages of disease, and classification based on treatment—almost all the kinds of time dependencies I have covered in the previous sections. As the materials—or indeed anamneses—collected by COPSAC are highly complex with regards to both disease histories and samples, the project has the potential to produce complex classifications.

The other project, Data for Good Science (started in 2018), is concerned with the other end of the life course and seeks to understand aging and disease late in life, and therefore has different challenges in setting up a cohort. Dealing with the causes and progression of diseases in old age—diseases that develop over a lifetime—researchers in this project cannot wait for samples to age, but must draw on historical material: early case notes and diagnostic samples from patients whose diseases at old age are known. The material consists of biopsies, microanatomical descriptions of pathological slides, case notes, and data, which are investigated to discern patterns leading to particular outcomes. The project thus does exactly what collections, anamneses, and historia do so well—finding patterns and tracing developments that link past and present events. But the use of historical samples in current projects reverses the temporal order of the early pathological collections in which the specimen was the endpoint of disease and the case history described what came before. Now the

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41 COPSAC (n.d.).
42 Some projects do set up cohorts and “wait” for disease to emerge late in life, but in order not to wait for a whole life-time, they recruit older patients. UK Biobank for instance recruited 40–69 year olds: Biobank UK (2022).
43 Data for Good Science (n.d.-a; n.d.-b; n.d.-c).
physical samples constitute the past—or memory that has been delved into, a form of material anamnesis—and doctors and researchers base prognoses for today’s patients on comparisons with old samples.

 Returning to the idea of anamnesis, doctors are encouraged to not to shape the patient’s account of their disease—they should remain open. Using old materials shows that, in the same way, samples remain open to new inquiries: they can reveal fresh knowledge when interrogated with new lines of inquiry and new technologies.\(^{44}\) At the same time, the frustrations of researchers using material collected for quite different purposes reveal that no history is entirely open to be recollected; the material prehistory or anamnesis is formed by both past and current categories and questions.

 Both research projects, COPSAC and Data for Good Science, integrate temporal developments in their classifications of diseases and thereby stratify disease courses from past patient histories. This approach is taken a step further by big data projects that draw solely on case notes and patient data. They integrate the classification of diseases and life courses, so it is no longer particular diseases that are classified, but rather the types of life courses typical of those who suffer those diseases. Thus, a category consists of a particular sequence of ailments, events, and other diseases that precede a given disease. The full lives of patients become histories that can be recollected to form clusters (Figure 5).\(^{45}\)

**Conclusion: Anamnesis and History of Medicine**

The investigation of how disease concepts have been materialized by collections has revealed that medicine is past-heavy. Not just in the obvious sense that all sciences are formed by their history, but in the stricter sense of being dependent on historical material.\(^{46}\) So despite its air of immateriality and future potential, even data-driven medicine is built on collecting and recollecting the past. The missing pieces of medical knowledge are—as is understood by a doctor taking an anamnesis—frequently found in the past. And extending the practice of anamnesis beyond clinical practice opens a set of nested boxes of medical histories: the clinical anamnesis, the collection-based formation of disease categories, and the history of how those categories have developed.

 The work with collections can be seen as a second-order anamnesis: an opening of the discipline’s collective “memory” that consists of bodily material and histories from an accumulation of past patients. These collections of physical samples and case notes are accessed by doctors and researchers to create disease categories and to generalize

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\(^{44}\) On the information hidden in samples of human tissue, see, for instance, Gere & Parry (2006).

\(^{45}\) This paper marks a shift in emphasis relative to classic accounts in history of medicine that describe how focus changes from patient narratives to generalized disease entities in the 19th century, and how the doctor–patient relationship simultaneously weakens: Foucault (1963/2003); Fissell (1991). In this account, individual anamnesis moves through the whole history, as do generalized disease categories.

\(^{46}\) See also Daston (2017).
the courses of disease. In this process, old material reveals new knowledge. Using the collections thus mirrors Plato’s idea of anamnesis in which knowing is defined as recollecting—accessing what we already know or re-using materials already collected. Likewise, it mirrors modern-day anamnesis where a doctor establishes a pattern already in the patient’s memory, but not acknowledged or recollected before. Disease classifications—like diagnostics—combine observation in the present and records of the past.

The successive practice of working with collections to establish disease categories can be described as a third-order anamnesis. It gathers a collection of collection practices and constitutes an anamnesis or historia of the discipline of medicine. It discerns a pattern and course of development in how collections, categories, diseases, time, diagnoses, and prognoses are connected as a doctor might discern patterns and a trajectory in a patient’s symptoms.

The historical account resulting from these nested anamneses identifies collection practices that use past material to generalize disease categories and courses. At the same time, it tracks a development in the relation between categorization and disease trajectories as the courses of diseases lengthen. In the pathological collections the main interest was to establish categories of disease from specimens taken at death—whereas patient histories were of secondary importance. This changed into an interest in the development of disease generated in experiments and followed on consecutive microscopic slides. And now research projects are occupied with categorizing sequences of events in patients’ lives, and thus seek to categorize whole life courses with all the signs and ailments that precede a disease. We have thus seen a historic development in which temporality has become incorporated into disease classifications. In the case of cancer, diagnoses started as an anatomical or histopathological category (the place of cancer and type of tissue). Then as treatment options improved, the diagnosis came to include developmental stages (size and spread) and molecular features defined by the treatments that worked. And last—even if only in the imaginations of big data researchers—cancer can be classified as an end point of a particular course of risk factors and comorbidities (a sequence of events and ailments that eventually develop into the cancer in question).

The different kinds of histories or anamneses also connect history of medicine to medical practices. Investigating the development of disease in an individual patient is not seen as a historical endeavour, nor is producing a longitudinal study of how a disease unfolds over time. Denoting them as history here, however, highlights parallels between history and medical practices that employ past material and data. The different orders of anamnesis—diagnosing a patient, forming a disease concept, and incrementally changing disease concepts—are comparable processes that take place over different time spans: the anamnesis in the clinic operates over periods from months to a lifetime; the research practices utilizing old or preserved human

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47 This tension between categorizing and staging disease still causes problems in both research and the clinic. A biopsy might, for instance, show some cells that are indeed cancerous, but develop so slowly as to be inconsequential, or cells of an aggressive cancer at an early stage that develop fast.
material to track life courses operate across generations; and the historical layers in our current disease concepts have been formed over the last 200–250 years. We thus give up the stark division between history for its own sake and the instrumentalization of history involved in the medical investigation of samples. Instead, we gain a history that informs present concepts of disease, while revealing medical practice as steeped in history. Medicine is a historical science based on the recollection of patients, of collected material, and of its own history.

Anamnesis also becomes a historiographical stance. As noted in the introduction, it looks at history from the point of view of the present to investigate the role of old materials in medicine. But rather than imposing a modern view of disease onto the past, it remains open and investigates history without imposing present ideas on it. It thus allows history and current understandings of medicine to inform each other. This contributes to medicine by highlighting the material way in which old bodily material and definitions of disease are inevitably transported into investigations of the body; and it contributes to history—not just by offering a historical account about how temporality becomes part of disease classification—but also by loosening up the stalemate between contextual history and history that views diseases as timeless scientific entities that can be identified across all contexts.48

Pulling the many strands of this paper together, we may—as a coda—return to the Renaissance, to an author of early medical historia, Girolamo Cardano (1501–1576). He was a physician with interests in maths, astronomy, and general encyclopedism. When writing on medicine, he offered a piece of advice that sums up the role of anamnesis. He suggests that “the studious man should always have at hand a clock and a mirror”—a clock to keep track of the passage of time and a mirror to observe the changing condition of his body.49 Long after Cardano’s time, this combination turns out to be useful not just for the wise man, but also for understanding the discipline of medicine. The mirror and the clock capture a mode of inquiry—the anamnesis—that recollects the past, notes the passage of time, and examines the present.

References


48 See Cunningham (2002); Stein (2014).
49 Siraisi (2016).


Biobank UK. (n.d.). Biobank UK. Retrieved 2022, November 30, from https://www.ukbiobank.ac.uk


