Vitiligo in the 19th-century dermatological works of Vincenzo Chiarugi, Robert Willan, Jean-Louis Alibert, and Ferdinand von Hebra

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Abstract

Vitiligo is an iconic dermatological pathology, as its clinical manifestations indelibly mark the patient through the appearance of white spots all over the body. The oldest written testimonies referring to vitiligo are the first texts of Ayurveda, the Ebers Papyrus, and the Leviticus of the Old Testament. During the Roman Empire, the doctors Aulus Cornelius Celsus and Galen, respectively, in the I and II centuries AD, were the first to describe this skin disease, and their statements were used by all subsequent authors. Hieronymus Mercurialis in the XVI century, Joseph Jakob Ritter Plenck in the XVIII century, and Vincenzo Chiarugi again in the XIX century based their writings on the references of the two Roman doctors. After centuries of scientific inaction in the XIX century, there was an exponential increase in dermatological studies, and the medical-scientific works produced in this period laid the foundations of modern dermatology. The nineteenth-century texts of Robert Willan and Thomas Bateman, Jean-Louis Alibert, Ferdinand von Hebra, and Moriz Kaposi proved fundamental for the study of skin pathologies, including vitiligo. The nineteenth-century medical-scientific vision and approach to vitiligo are shown in this work through the presentation of direct quotes extrapolated from the most important works of the authors mentioned above; this served to historically contextualize the gradual progress of medical study regarding this skin pathology.

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Introduction and historical contextualization

Vitiligo is a chronic acquired skin pigmentation disorder characterized by the progressive loss of melanocytes. The pathology manifests itself in the form of white patches, often symmetrical, which, over time, tend to grow and widen. The classification model accepted by the Vitiligo Global Issues Consensus Conference (VGICC) is based on clinical reasons and distinguishes two main forms of vitiligo: segmental vitiligo (SV) and non-segmental vitiligo (NSV).[1,2]

Nosological studies on dermatological pathologies have their roots in the XVIII century. In 1776 the Austrian doctor Joseph Jakob Plenck (1735-1807), following the lines of Carl Nilsson Linnaeus (1707-1778), published the "*Doctrina de morbis cutaneis*," *i.e.*, a dermatological classification according to the morphological criterion of clinical manifestations.[3,4]

The XIX century can be considered the most flourishing century for dermatology since the figure of the dermatologist began to emerge and become academically and scientifically autonomous.

In Europe, various schools of thought emerged and developed in England, France, and Austria, while dermatology in pre-unification Italy advanced thanks to the contributions of prominent figures in the medical field.

The most important dermatology centers flourished in the cities of London, Paris, and Vienna. The scientific advances carried out by the various founders of the schools allowed the proliferation of further branches throughout Europe.[5-8]

The most eminent medical personalities who brought dermatology towards modernity were: Vincenzo Chiarugi (1759-1820), who was among the first Italians to dedicate himself to the study and classification of skin diseases; Robert Willan (1757-1812) and Thomas Bateman (1778-1821) in London, who attempted the first classification of skin pathologies through the morphological description of the lesions; Jean-Louis Alibert (1768-1837), founder of French dermatology in Paris; Ferdinand von Hebra (1816-1880) and Moriz Kaposi (1837-1902) in Vienna, who combined dermatology with the disciplines of anatomy, histology, and general pathology, thus arriving at modern dermatology.

Vincenzo Chiarugi, promoter of dermatological nomenclature in Italy

In 1788, Vincenzo Chiarugi took over the direction of the Royal Hospital of Bonifazio in Florence with the title of "*Primus*

Infirmarius" and welcomed the so-called "incurable" patients who were suffering from the most disparate diseases. Here, the doctor from Empoli had the opportunity to deal directly with skin pathologies through direct observation of patients and experimentation with various therapeutic methodologies.[9,10]

In 1799, the *"Saggio teorico-pratico sulle malattie cutanee sordide osservate nel regio spedale di Bonifazio di Firenze"* was published, introducing the European scientific trend of the nomenclature of pathologies into Italy. The second edition of the aforementioned text, printed in 1807, is a revised, enlarged, and edited version in two volumes with the title *"Delle malattie cutanee sordide in genere e in specie. Trattato teorico-pratico."*[11-13]

The work, despite still being permeated by humoral theories and lacking both physiology and microscopic anatomy, proved fundamental for the cataloging of dermatological diseases and specifically for the classification of vitiligo. Chiarugi includes vitiligo among the diseases belonging to the class of "macular skin diseases" and in the order of "organic spots," *i.e.,* that set of pathologies characterized by a change in color of one or more parts of the body due to a lesion of the cutaneous organism and in the absence of bumps or growths.[14]

The term vitiligo refers to the presence of one or more spots on the skin with the following characteristics: depression of the surface, color change, softness of the tissue, insufficiency of mobility, and insensitivity. The author explains how the change in the natural color of the skin resulted from the absence of organic nourishment. This process is the result of the blood moving away from the affected points. As it no longer provides the nutritional elements, it leads to deficient skin regeneration and causes typical peculiarities of the disease, such as sagging, dryness, and numbness of the skin.[14]

Chiarugi lists three types of vitiligo: scar vitiligo, white vitiligo, and black vitiligo.

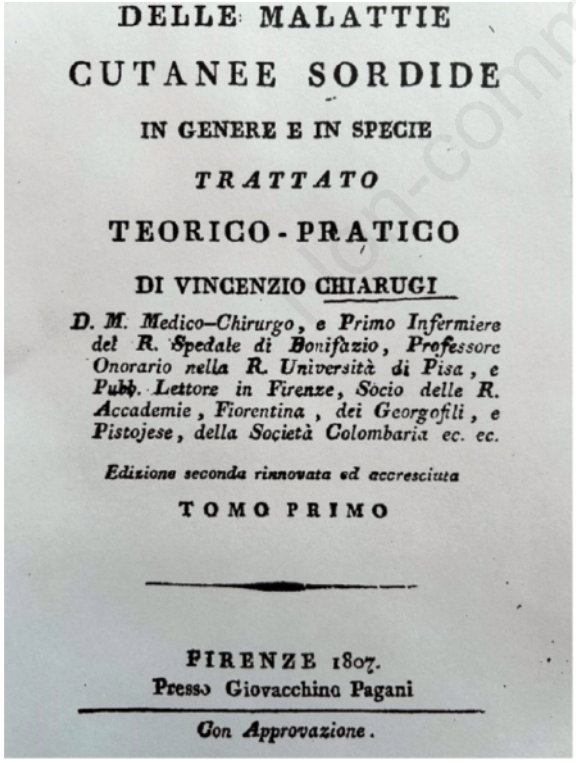
Scars and stretch marks are included within the vitiligo grouping because they are considered spots foreign to the original skin tissue and produced following the repair of a lesion. White vitiligo refers to that skin disease identifiable with some small, white, non-converging, slightly sunken, soft, smooth, and insensitive spots. Chiarugi declares that he has never directly observed white vitiligo; the only evidence of this type of disease is in ancient texts. Finally, the author, as for white vitiligo, refers to ancient texts to describe black vitiligo, *i.e.*, small dark-colored spots with a slightly scaly surface (Figures 1 and 2).[14]

Robert Willan and Thomas Bateman, pioneers of modern dermatology

In the XVIII and XIX centuries, in London, health dispensaries were the only facilities that provided care for the sick and poor, which is why they were in the city's slums.

After studying medicine in Edinburgh, Robert Willan moved to London in 1783 to the Carey Street Public Dispensary and remained there until 1803. During this working period, Willan became interested in skin pathologies and, with Thomas Bateman, his favorite student and colleague, began making a new dermatological classification.[15]

Willan simplified and perfected Joseph Plenck's nomenclature following the methodological outlines of Carl Linnaeus. His cataloging was mainly based on the observation of the morphological characteristics of skin diseases, excluding, however,


DELLE MALATTIE
CUTANEE SORDIDE
IN GENERE E IN SPECIE
TRATTATO
TEORICO-PRATICO
DI VINCENZIO CHIARUGI
D. M. Medico-Chirurgo, e Primo Infermiere del R. Spedale di Bonifazio, Professore Onorario nella R. Università di Pisa, e Pubb. Lettore in Firenze, Socio delle R. Accademie, Fiorentina, dei Georgofili, e Pistojese, della Società Colombaria ec. ec.
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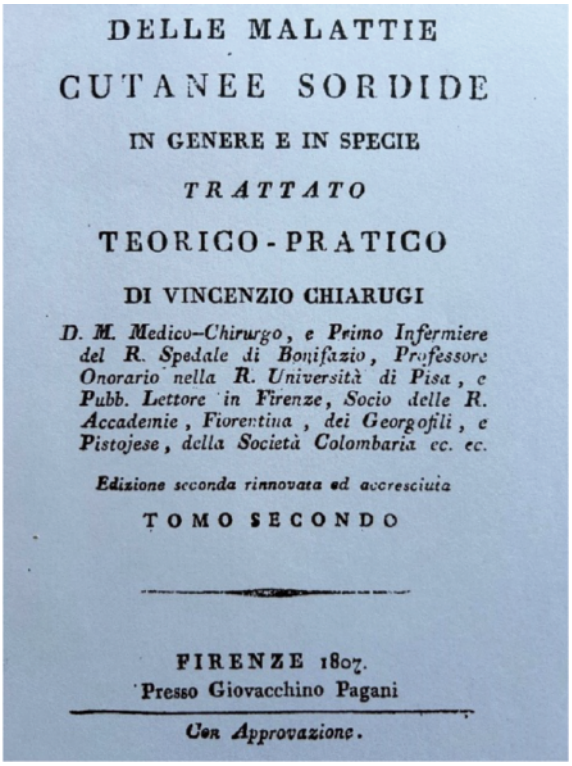
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Figures 1, 2. Title pages of the two volumes of Vincenzio Chiarugi's work "*Delle malattie cutanee sordide in genere e in specie. Trattato teorico-pratico*."

the etiological and pathophysiological characteristics. The new classification system was based on eight orders: papules, scales, rashes, bullae, pustules, vesicles, tubercles, and macules. Each order was divided into genera, which in turn were divided into species.[16,17]

In 1808 the first volume of the work entitled "*On Cutaneous Diseases"* was presented, in which the first four orders of his dermatological nomenclature were treated in detail. For the first time, color illustrations and watercolors describing the lesions were included, as the fundamental importance and educational necessity of explanatory images was understood. Willan planned to publish the second part of his work and the description of the last four orders, but he died in 1812.[18,19]

Thomas Bateman became Willan's pupil in 1801 and replaced his master in 1804 at the Carey Street Dispensary.[20,21] He purchased the copyright of his predecessor's works, thus inheriting his studies and continuing the valorization of dermatological studies. In 1813, the book entitled "*A practical synopsis of cutaneous diseases, according to the arrangement of Robert Willan*" was printed, which dealt with the remaining four orders of Willan's dermatological classification.[17,20,22,23] Here, Bateman states that Willan adopted the term "vitiligo" to indicate a rare disease, the meaning of which differed from that originally given by Celsus in his works. Vitiligo is cataloged as the fourth genus out of the eight total, which form the order of the tubercles, *i.e.*, the seventh order within the classification of two English doctors. The pathology is described as follows:

"It is characterized by the appearance of smooth, white, shining tubercles, which rise on the skin, sometimes in particular parts, as about the ears, neck, and face, and sometimes over nearly the whole body, intermixed with shining papulae. […] All the hairs drop out, where the disease passes, and never re-sprout, a smooth shining surface, as if polished, being left, and the morbid whiteness remaining through life. The eruption never goes on to ulceration. There is no considerable constitutional disorder combined with this affection."[24]

The therapies used up to that point were based on the use of acidic minerals for internal therapies and on the use of very diluted caustic substances for external therapies. Bateman concludes his treatment of vitiligo by declaring that both remedies administered did not lead to any curative effect.

The work of the two English doctors paved the way for the study of the morphology of skin diseases, and their observations gave impetus to the study of skin medicine, leading to the birth of dermatology as a distinct and autonomous discipline. Their works became the main references for subsequent generations of dermatologists, which is why the two English doctors are considered the pioneers of modern dermatology (Figure 3).[24]

Jean-Louis Alibert, founder of the French dermatological school

Jean-Louis Alibert is canonically recognized as the founder of the French dermatological school and his entire career is inextricably linked to the great Parisian hospital Saint-Louis.

In 1801, Alibert became a substitute doctor at the Hôpital Saint-Louis in Paris, which at that time was known as the Hospice du Nord. This hospital, founded in 1607 to welcome contagious patients, became a structure used for chronic, cachectic, and contagious pathologies; with this definition, they wanted to include the majority of dermatological diseases.

In 1803, Alibert was appointed the actual doctor of the hospital and immediately set up a special pavilion for skin diseases. During his stay at Saint-Louis, the French doctor dedicated himself completely to the study of skin pathologies. In 1806, the "*Description des maladies de la peau observées à l'Hôpital Saint-Louis*" was published, in which a new classification of all skin diseases was presented through a new cataloging method developed by him.[25,26] The work in question was enormously successful thanks to two innovations. The text, written in French and not in Latin, allowed for greater diffusion in French medical-scientific circles. The book was accompanied by 53 plates engraved in copper and in color, which were produced with very high-quality engraving methods, thus allowing the quality of the representations to be improved. They played a very important pedagogical role for medical students.[27] Over the years, he perfected his dermatological classification method, developing the so-called "natural method." This method ordered skin pathologies according to various criteria: cause, natural course, duration, appearance, and response to therapy.

Alibert's studies were inspired by the works of botanical taxonomy produced by Bernard de Jussieu (1699-1777) and

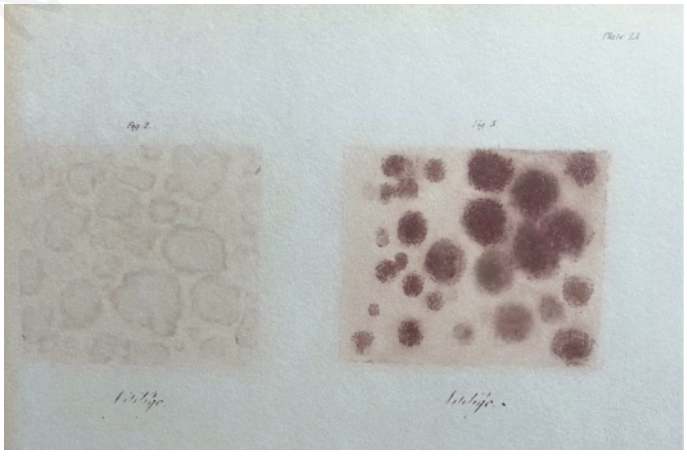

Figure 3. Color illustrations of the clinical manifestations of vitiligo presented in Thomas Batheman's book entitled "*Delineations of cutaneous diseases, exhibiting the characteristic appearances of the principal genera and species, comprised in the classification of the late Dr. Willan."*

Antoine Laurent de Jussieu (1748-1836); this involved the development of a natural nosology applied to dermatology, which was based on the belief that each disease had a specific nature and possessed unique and detectable symptoms, signs, causes, and courses. This thought derives from the fact that Alibert, working in a long-term hospital like the Saint-Louis, was used to observing patients' skin lesions daily and for long periods. This led to the development of a classification based on the progressive evolution of the various pathologies.[28]

In 1833, the "*Clinique de l'Hôpital Saint-Louis, ou Traité complet des maladies de la peau*" was published. In this book, Alibert presents his classification of skin diseases using a dermatosis tree. The tree is composed of twelve branches representing the families of dermatoses, from which further ramifications indicate the various skin pathologies.

Within Alibert's nosology of skin diseases, vitiligo is placed as a species specifically called "Acromo Vitiligo," belonging to the genus Acroma and forming part of the eleventh order, *i.e.*, that of dischromatous dermatoses.

In the introduction to the order of dyschromatous dermatoses, the author explains how this type of pathology is characterized by flaps of integument from which the pigmentary functions in one or more anatomical regions have accidentally been removed. Vitiligo is specifically presented as follows:

"L'espèce dont il s'agit ici se manifeste par des taches ou des décolorations accidentelles, d'une dimension plus ou moins grande et de forme très-variée. Elles sont jetées çà et là comme des gouttes de pluie (*guttarum guttarum in modum hinc inde dispersae*) sui la périphérie du corps. Remarquons bien que la peau malade n'est ici ni *proéminente*, comme dans l'*herpes*, ni *déprimée*, comme dans la *leuce*; elle est toujours de niveau avec le reste du tégument: c'est un simple phénomène à d'*albification*, auquel les poils et les cheveux participent quelquefois. Il paraît qu'en cette occasion la couche gemmulée cesse d'accomplir son dépôt pigmentaire; c'est ce qui donne lieu à ces taches d'un blanc mat, qui forment une sorte de contraste avec la couleur ordinaire du tégument."[29]

The explanation of the clinical manifestations of vitiligo is accompanied for the first time by the description of clinical cases observed by Alibert at Saint Louis Hospital. At the end of this section, Alibert states that the etiology of this type of skin disease was still unknown at the time since the processes through which the mechanism of the pigmentary function of the skin occurred were still scientifically unexplored.[29]

During his career, Alibert strenuously defended his classificatory method. Over the following decades, its cataloging was outclassed by the simpler and more effective classification of Robert Willan and Thomas Bateman, which was based on the anatomy of primary skin lesions, and this allowed for an easier clinical diagnosis.[25,28]Alibert's system produced an increase in words referring to skin diseases, which, however, lacked exhaustive descriptions of skin lesions; this increased the complexity of recognizing dermatological pathologies (Figure 4).

Ferdinand von Hebra and Moriz Kaposi, fathers of modern dermatology

Ferdinand von Hebra is considered the father of modern dermatology and a proponent of the Vienna dermatological school. He revolutionized the studies of skin diseases through the creation of a new dermatological nosology based on anatomopathological criteria. In 1843, he joined the Wiener Allgemeinen Krankenhaus (Vienna General Hospital) in the department managed by Joseph Škoda (1805-1881), who entrusted him with the management of the "skin rashes" section. The experience accumulated among dermatological patients allowed him to obtain the position of head of an independent department specializing in skin diseases and teaching at the University of Vienna in 1845. In 1849, he became an associate professor and, at the same time, assumed the position of head of the hospital dermatology clinic, founded in the same year, but only in 1869 he was appointed full professor of dermatology at the University of Vienna.[30,31]

Hebra immediately ventured into the study of skin diseases, and thanks to his anatomical-pathological knowledge, deriving from the thought of Carl Freiherr von Rokitansky (1804-1878), founder of modern pathological anatomy, he devised a new approach to the subject. Dermatological nosological methodology was based on the pathological processes of diseases and not on the objective description of clinical manifestations. Hebra used the experimental method through which he was able to ascertain the pathological evolution of skin lesions. Thanks to this new approach, he rationalized dermatology, eliminated all the components still based on archaic theories, and gave scientific authority to dermatology, projecting it towards modernity.[32]

His most important work is the "*Lehrbuch der Hautkrankheiten,*" which was divided into two volumes and developed with his favorite student, Moriz Kaposi.[30,31] The authors here present their innovative dermatological classification, which was structured in twelve classes within which the respective pathologies were present, but for the first time, the diseases were presented in this way: definition, history, symptoms and

Figure 4. Dermatosis tree by J. L. Alibert in which the location of vitiligo is indicated by the arrow. The illustration is present in the text *"Clinique de l'Hôpital Saint-Louis, ou Traité complet des maladies de la peau."*

development, prognosis, etiology, diagnosis, anatomy, and therapy.

Upon the death of Ferdinand von Hebra, his favorite student, Moriz Kaposi, continued his mentor's studies, brought the Vienna dermatological school to the highest levels, and made it the continental point of reference of the last quarter of the XIX century.

Kaposi began his career as a professor in Vienna in 1875, was appointed Hebra's deputy in 1879, and became the head of the dermatological department in Vienna in 1880. The lines of research traced up to that point and based on the study of the anatomical-pathological evolution of skin lesions were maintained and further developed.[33,34]

Between 1870 and 1876, Hebra and Kaposi jointly published the "*Lehrbuch der Hautkrankheiten*" in several editions.[35] In this work, for the first time, the topic of vitiligo was approached scientifically, and the study was based on the typical cornerstones that characterized the methodology of two Viennese doctors. In their classification, vitiligo is included within the seventh class, *i.e.*, the class of "Skin Atrophies." The authors explain how this group includes diseases recognizable as pigmental, achromatic, and leukopathic atrophies. Vitiligo is placed in the subgroup of leukoderma acquired as an idiopathic form. The following section includes a brief prologue that discusses the etymology and historiography of the disease over the centuries, which has led to both clinical and conceptual confusion. Hebra and Kaposi concisely and clearly define vitiligo with these words:

"We understand by the term vitiligo that peculiar disease of the skin in which round, oval, sharply defined white (pigmentless), not scaly (smooth) patches develop on the skin, and steadily increase in size, whilst their borders appear surrounded by even abnormally dark pigment."[36]


LEHRBUCH

DER

HAUTKRANKHEITEN

VON

DR. FERDINAND HEBRA, o. ö. Professor der Dermatologie an der Universität in Wien. und DR. MORIZ KAPOSI, Docent u. em. Assistent der dermatologischen Klinik in Wien.

ERSTER BAND.

Zweite Auflage.

(Separatabdruck aus dem „Handbuch der speciellen Pathologie und Therapie" von Rud. Virchow, III. Band.)

ERLANGEN,
VERLAG VON FERDINAND ENKE.
1874.

Figure 5. Frontispiece of the work by Ferdinand Hebra and Moriz Kaposi, *"Lehrbuch der Hautkrankheiten."*

The scientific method and the modern dermatological idea are revealed through the structuring of the analysis of the pathology; in fact, it is treated in the following aspects: symptoms, development, course, prognosis, etiology, diagnosis, anatomy, and therapy. The authors, despite presenting a meticulous description of vitiligo, are aware of the incurability of the disease and the ineffectiveness of any therapy administered to patients up to that point. The two doctors from Vienna also openly declared that the etiology of vitiligo was completely unknown, although medical research had been supported by other clinical sciences. These two statements are reported as follows:

"Even if we adopt this view, however, which is supported by the therapeutical and physiologico-histological data mentioned, yet not only does the original cause of the cessation of the transference of pigment remain still unexplained, but, also, there is no reason suggested why the atrophy of pigment commences at widely separated parts of the body, and why it steadily spreads from these foci in a circular manner."[36]

This work had a total influence and laid the foundations of modern dermatology. It was translated into several languages, contributing to the international diffusion of the theories of the Viennese school and standardizing the nosology of skin diseases. Thanks to their work, Ferdinand von Hebra and Moriz Kaposi managed to move the world center of dermatological studies to Vienna, taking away the primacy from England and France and training an entire generation of doctors who left their mark on international dermatology (Figure 5).[37,38]

Conclusions

The texts proposed and analyzed are clear testimonies of the medical progress relating to the study of vitiligo during the XIX century. The clinical approach based on the texts of the ancients and permeated by humoral theories was progressively abandoned and replaced by a structured scientific methodology supported by other sciences. Dermatological schools were born and developed in various European countries, whose exponents dedicated themselves to the formulation of nosological classifications of skin diseases. The historical-medical digression proposed here allows us to understand the gradual change of perspective towards vitiligo. Vincenzo Chiarugi's work is a demonstration of how vitiligo was treated through the classical medical elements of Celsus and Galen.

The advent of dermatological schools in London, Paris, and Vienna laid the foundations of modern dermatology. The works of Willan and Bateman, Alibert, Hebra, and Kaposi made it possible to better understand and treat skin pathologies, including vitiligo. Despite the scientific advances achieved by these eminent doctors, the pathogenesis of vitiligo remained obscure, and the therapies used up to that point were completely ineffective. The medical-scientific awareness of the enigmatic nature of vitiligo pushed subsequent dermatologists to try their hand at studying this pathology. In the following decades, further studies on vitiligo were undertaken, for example, by Pierre Louis Alphée Cazenave (1795-1877) and Jean-Louis Brocq (1856-1928) in Paris, Isidor Neumann (1832-1906) in Vienna, and William S. Gottheil (1859-1920) in New York.

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