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Folk Medicine Practices among the Tuareg of Hoggar through the Book The Tuareg in the North by Henri Duveyrier (1840-1892)

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Abstract

This research paper explores the most important traditional practices and methods used by the Tuareg of Hoggar in treating various illnesses, drawing on a key source: *Les Touareg du Nord* (The Tuareg in the North) by the French writer Henri Duveyrier. The study focuses on the colonial period, during which people sought healing and treatment through simple and traditional means.

This study aims to shed light on the figure of the French explorer Henri Duveyrier and his historical writings, highlighting the most significant diseases and epidemics he documented in this source. It also examines the main healing methods he observed, by identifying the therapeutic benefits of the remedies used by the local population to alleviate the severity of these illnesses.

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Introduction:

The health conditions during the colonial period in Algeria in general, and in the Hoggar region in particular, were extremely dire—especially with the emergence of numerous diseases and epidemics throughout the country. The Tuareg community of Hoggar in the south was not isolated from those circumstances and the socio-political changes of that colonial era. These harsh realities prompted the Tuareg people to seek solutions for their ailments using rudimentary means and popular methods that reflected their nomadic way of life.

Accordingly, this academic study aims to clarify the traditional healing practices that spread widely in the Hoggar region, and to assess the extent of their impact and effectiveness in alleviating the severity of illnesses, even if only partially. These treatments relied on the use of the natural resources offered by the desert environment both plant- and animal-based.

This research adopts a historical-descriptive method, particularly in detailing the healing techniques practiced by those tribes and in analyzing their influence on the health and social life of the population. These practices captured the attention of French and European explorers and military leaders, who documented them meticulously as part of their interest in the popular cultures of local tribes. Among the most prominent of these observers was the French explorer Henri Duveyrier, whose book *Les Touareg du Nord* (The Tuareg in the North) devoted significant attention to the health aspects and folk practices of the Tuareg people.

To address this topic in a precise and comprehensive manner, the following research question is posed:

What are the most important traditional methods and practices used by the Tuareg of Hoggar to confront diseases and epidemics, as documented in Henri Duveyrier's book *Les Touareg du Nord*?

1- Introduction to the figure of Henri Duveyrier:

Henri Duveyrier was born in Paris on February 28, 1840. He studied commerce in Germany in accordance with his father's wishes when he was only 14 years old. However, his personality leaned more toward observation and travel, as he exhibited great intelligence for his age. He also learned the German and French languages, and began recording his observations on birds and plants. He even conducted some meteorological observations in the state of Bavaria where he lived. Thus, he completed his studies at the School of Commerce in the city of Leipzig during the period 1855-1857, but his ambition always leaned toward travel and exploration.¹

Duveyrier had a strong desire for travel and adventure, as he wrote in his memoirs: "I felt an irresistible attraction to the African continent." Among the influential figures on the explorer Duveyrier was the explorer Henry Barth (Barth Henry)², who left behind many stories of his journeys and adventures that encouraged Duveyrier in his own explorations. Barth also taught him lessons in the Arabic language in preparation for his Arab and African travels.³

Henri Duveyrier undertook numerous journeys. His first was a preparatory trip to Algeria in 1857, during which he visited Algiers, the High Plateaus, Laghouat, and the desert side of the Aurès Mountains⁴. The journal of this journey was published in Paris in 1900. He then returned to France and traveled to England, where he met the German explorer Henry Barth (H. Barth), who encouraged him and gave him several recommendations.⁵

His second journey began in Skikda in 1859, passing through Biskra, then to El Guerrara, Ghardaïa, Metlili, and finally El Menia, where he was detained. This forced him to return to Ghardaïa and Laghouat⁶, then head back to El Guerrara, then to Touggourt, and from there return to Biskra, intending to rest in Constantine.

In February 1860, he embarked on his third adventure, initially heading to the Souf Valley and from there to southern Tunisia after receiving French assurances of safety. He then returned to Biskra. In June 1860, he was assigned a mission to establish trade relations between the French and Africans in the Saharan region, departing from the Souf Valley to Ghadames⁷, which was a trade hub for Saharan caravans. He succeeded in this mission by gaining the trust of the Tuareg and the leader of the Tuareg of Ajjer, Akhnoukhen⁸. He was thus able to travel between Ghat, Fezzan, and Tripoli and then returned to Algeria to continue his journeys. However, serious illness prevented him from achieving his goals.⁹

Some sources mention that his physical and psychological condition deteriorated, and he lost his memory. As a result, he died by suicide in 1892. Therefore, it can be said that the man played a major role in facilitating the French colonial mission in gaining economic and military control over the African region.¹⁰

Duveyrier gained significant scientific standing in the field of exploration and research in the Hoggar region, becoming a major reference for European explorers who consulted him until his death. He was also of great benefit to naturalists, ethnologists, and geographers. He earned membership in the High Committee of the Trans-Saharan Road (Transsaharien) established in 1879, and was awarded the Legion of Honour (Chevalier de la Légion d'Honneur) at the age of twenty-two in 1862. He also received a medal from the Geographical Society for his book *Les Touareg du Nord*, which he published in 1864.

2- The Most Important Works of Henri Duveyrier on the Algerian Sahara:

Henri Duveyrier undertook several missions and expeditions to various regions of the Sahara, and wrote many reports and studies on them. Among the most notable are:

- Journey in the Sahara, in the Algerian and Colonial Journal, volume 3, September 1860, pp. 439-442 (the report was written in Ghadames on August 14, 1860).
- Note on the Tuareg and Their Land, in the Journal of the Geographical Society, volume 5 of the fifth series, January to June 1863, pp. 102-125.
- Exploration of the Sahara: The Tuareg of the North, Paris, Challamel Ainé Publishing, 1864, xxxlv-499-37 pages, xxxl plates.¹¹
- History of the Explorations to the South and Southwest of Geryville, Paris, 1872, p. 39.
- Routes from Metlili to Hassi Bergh-Soui and from El-Gol  a to Metlili According to a Travel Journal from 1859, Paris, Martint Printing House; no date, 35 pages.¹²

As for the book that is the subject of our study, it is *Les Touareg du Nord* (The Tuareg of the North). It is a comprehensive study of the "Tuareg of the North" written in French, with great care and precision. It consists of 474 pages and includes a subject index that addresses many points, including: topography, geology, climate, water resources, flora and fauna. It also examines the political, social, and health organization of the Tuareg.¹³

The book recounts a journey to the Tuareg of the Ajjer region in 1861, where he stayed for two years. It is the most important contemporary source discussing the Tuareg of Ajjer and also includes valuable information about the Tuareg of Hoggar, whom he was unable to visit due to security reasons.¹⁴

The main edition of the book was published in 1864 in Paris. Many historical sources interested in the history of the Algerian Sahara in general and the history of the Tuareg in particular confirm the importance of this historical source, due to the abundant and valuable information it contains. The author relied on ancient books and local narratives in addition to his own observations, which were not limited to the Tuareg of the North but also included the Tuareg of the South, such as those in the Hoggar region.¹⁵

3- Epidemics and Diseases Among the Tuareg Society of the Hoggar:

The Hoggar region experienced a severe and dangerous spread of epidemic diseases during the French colonial period, which claimed the lives of many inhabitants, especially during peak periods. This was due to the rapid spread of the epidemics, the lack of vaccination and prevention campaigns because of war conditions, and the miserable living situation Algeria was enduring under French occupation. These circumstances further deteriorated the social conditions of the population, making them easy prey for various types of diseases and epidemics.

It is noteworthy that these diseases and epidemics were characterized by being contagious and spreading quickly from one area to another due to several factors and causes, including but not limited to:

- **The commercial factor**, through the trade journeys and caravans to and from the Hoggar. Trade exchanges between the Tuareg tribes of the Hoggar and Sudan were very active in acquiring and exchanging consumer and livestock goods. The Tuareg economy of the Hoggar was purely commercial. Markets like Tidikelt represented the closest commercial hub for the Tuareg of the Hoggar both before and after the French occupation. Thus, the movement of these caravans played a major role in spreading diseases and epidemics during the colonial period a fact confirmed even in foreign writings.
- **The scarcity of water in the region**, given its essential importance to human life. Water was a fundamental element in the daily lives of the Tuareg people, and necessary for watering livestock and herds raised by the tribes. Water was also crucial for everyday needs such as hygiene, cooking, and other basic requirements.

- **Lack of attention to daily hygiene**, as Tuareg families often moved from place to place across distant desert areas in search of pasture and water for their herds. Thus, they were in constant movement in a harsh natural environment, traveling long distances on their camels, with no opportunity for health precautions or disease prevention.
- **The settlement of many Arab elements in the Hoggar**, due to French colonial efforts to provide settlement areas for these nomadic tribes. These groups worked in various trades such as handicrafts, commerce, and other occupations. Consequently, the arrival of these groups from neighboring regions also contributed to the spread and expansion of disease and epidemics.
- **The miserable living conditions** of the Tuareg tribes of the Hoggar further facilitated the spread of diseases and epidemics. The population suffered from poverty and deprivation, lacking all essential means for daily life. The French colonial regime focused all its efforts on serving the interests of the French settlers and the French economy.

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Western travelers and the French in particular—gave significant attention to the health situation in the region through their military reports and personal memoirs, both before and after the French occupation of Algeria. These documents were marked by detailed description and observation. They also extensively analyzed and researched the diseases, looking into their backgrounds and using all available natural and social statistics. Their reports always supported their findings with tables and medical data for each disease. It is important to note that French writing often glorified French medical achievements in all southern regions. Moreover, the traditional healing practices used by the locals to treat their ailments attracted the attention of many military doctors, who were impressed by them despite the colonial bias that constantly tried to diminish the value of these indigenous practices in Hoggar society.

The French explorer **Henri Duveyrier** was among those who visited and showed particular interest in the social and health conditions of the Tuareg. He addressed these issues in his important and well-known study *Les Touareg du Nord*.

As for the diseases and epidemics that struck the region, they include:

- **Eye diseases:** These were due to the desert environment and the scattered sand. The Hoggar region is well known for the disease *trachoma*, which appears with the dust that spreads across the area throughout the year. Another common condition was *ophthalmia*, particularly prevalent among children due to sunlight reflection, sandstorms, the abundance of flies, and poor hygiene, etc.¹⁷. This condition is also called *trachoma* or *granular conjunctivitis* (Trachome), and it spreads widely among the settled population in Hoggar. It is a contagious and dangerous disease, causing blindness in approximately 1 out of every 100 people in southern regions.¹⁸
- **Respiratory diseases:** These emerge in the spring among nomads as colds (*eggebourou*) and bronchitis (*temeslek*). Their causes were attributed to dust dispersal and lack of proper cotton clothing. The thermal shift when moving from mountain areas to adjacent plains also contributed to these illnesses. *Whooping cough* spread widely among children; it is a bacterial disease that affects the respiratory system and is characterized by severe coughing and high fever.¹⁹

Many cases of gonorrhea, or what is referred to as the cold disease, were observed, particularly among the residents of Arem in the town of Tazrouk.²⁰

- **Joint diseases:** These appeared as muscle and nerve pain, commonly resulting from extreme cold and malnutrition.²¹ Henri Duveyrier explained the causes of these diseases by stating: "Those under thirty years of age do not suffer from rheumatism; some are paralyzed because of it. Lying on cooled sand at night and the exclusive use of cotton clothing explain the severity of this disease."²² Dr. Light confirmed that joint and muscle pains were widespread among the Tuareg, particularly *sciatica*, caused by severe cold affecting the bones.²³ Common symptoms among Tuareg patients included:
 - Mono- or polyarticular pain lasting from 4 to 5 days, sometimes reaching smaller joints, without causing fever.
 - Noticeable, prolonged joint pain.
 - Reactions in one or multiple joints.

The Tuareg call gonorrhea and rheumatism the cold disease ((K) tesmede) and bone cold disease (tesmede ta n resan). These diseases were common among the Harratins of Tamanrasset and in the Hoggar military camps. Rheumatism was often a long-term complication of widespread gonorrhea.²⁴

- **Smallpox (Variole):**²⁵ A highly contagious skin disease that spread significantly among the Tuareg of Hoggar, due to their constant travel and poor hygiene both men and women rarely bathed. The disease appeared more frequently in the spring. Trade relations between Hoggar and Saharan-Sudanese regions played a major role in its spread. Dr. *Paul Vermale* reported, after conducting skin examinations on 100 individuals, that two *Harratin* men aged 23 and 25 had smallpox scars on their faces. The disease also spread in Ain Amguel, where locals reported many deaths along the riverbanks. However, the outbreak remained localized in population centers and did not spread throughout all of Hoggar. Additionally, many Tuareg from Tidikelt, Sudan, Fezzan, Ghat, and Ghadames were infected but often did not report their illness. The permanent scar of smallpox was rare.²⁶

Smallpox spread especially during 1933 and 1934, striking fear among the population. It was often associated with spring rains or occasionally summer rains, and residents linked the outbreak to the tobacco harvest season. The disease spread rapidly, affecting both nomads in the highlands and settled villagers simultaneously. Farmers in the upper centers, however, were affected later (about a month and a half afterward). Thus, this seasonal epidemic may be considered a form of influenza.²⁷

- **Skin diseases:** Contributing factors included poor living conditions housing, clothing, food, and hygiene.²⁸ Symptoms included skin infections and *impetigo*. A common condition observed among the Tuareg involved white patches with irregular lines on the hands and wrists, possibly *vitiligo*, affecting the hands and feet due to exposure to extreme temperatures and the harsh nomadic desert lifestyle.²⁹

The Tuareg refer to skin diseases as Amahar or Aniru. Names and terms differ among Hoggar tribes, but Amahar is a well-known concept that includes all incidents of secondary and tertiary syphilis, called Ghamgham by the Arabs of Touat or Tidikelt. One key precaution practiced by the Tuareg upon identifying symptoms of Amahar is that women avoid marrying or having sexual relations with infected men. They also avoid the places where infected persons lay down or the camel saddles they used, for fear of contagion.³⁰

- **Hernia and bladder diseases:** These genital-urinary conditions were caused by long camel rides and extensive walking through the vast desert. *Syphilis*³¹ also spread widely among the Tuareg of Hoggar, killing many due to trade relations with Sudan.³²
- **Abdominal diseases:** These were widespread among the Tuareg of Hoggar and were linked to the type of food and water consumed.³³ Dr. *Purvis*, in his 1933-1934 medical report on diseases in the Hoggar region, stated that digestive system disorders had no specific patterns.³⁴ He also noted that common dental issues among Arabs were rare among the Tuareg, who paid great attention to dental hygiene.³⁵
- **Malaria (paludisme):**³⁶ This disease spread quickly among the Tuareg, who frequently swam in stagnant ponds, rarely bathed with clean water, and lacked proper hygiene. It was most prevalent at the end of spring, throughout summer, and the beginning of fall—conditions of heat and humidity promoted its spread.³⁷

Intermittent fever spread across all Hoggar tribes. Tuareg returning from Sudan often caught malaria, which they referred to generally as fever—characterized by heat, headache, and profuse sweating, known to them as Tenede VI+. Agricultural zones with palm trees were hotspots for the fever, particularly known as the first date-ripening fever (tazzak in giren) among the Tuareg.³⁸

Medical studies in Hoggar confirmed that most malaria cases were among the elderly. Harvest zones in the mountains of Akar and Amguel contributed to its spread. Even sedentary populations were not spared. Additional contributing factors included the movement of infected persons from outside Hoggar and seasonal climate shifts in May and October. These factors also caused malaria cases among Europeans in the region.³⁹

Dr. D. Foley stated that it was impossible to obtain an accurate count of malaria cases in Hoggar due to its vast area. Some cases were found in agricultural centers such as Abalessa, Silet, and Amguel. Additionally, the arrival of Arab migrants especially from Ouargla increased the number of foreign-origin malaria patients who could act as virus carriers.⁴⁰

- **Whooping cough:** This disease mainly affected children. Tuareg children suffered greatly due to the lack of vaccination campaigns. It is a bacterial infection of the respiratory tract, appearing as a severe cough and high fever that can last from four days up to eight weeks. ⁴¹

Thus, the absence of adequate health care to control infections led to the widespread occurrence of various diseases among the Tuareg of Hoggar during the French colonial period. The French prioritized the safety of settlers and soldiers, neglecting the indigenous population. Despite this, some limited French efforts in healthcare were observed, such as building clinics and deploying a small number of doctors—insufficient to cover remote populations. This led to increased mortality rates and a wide range of diseases, most linked to poverty, hunger, malnutrition, and ignorance of public health principles, all influenced by the Tuareg's social structure.

The environmental and geographic factors also contributed to the emergence and evolution of many epidemics that harmed the inhabitants of Hoggar. Many of these diseases became associated with French doctors and researchers who worked to identify and treat them, mostly to protect themselves from infection. These diseases and epidemics claimed many lives across all age groups—children, youth, and the elderly.

Henri Duveyrier, in Chapter VII of his book *Les Touareg du Nord*, titled *The Internal Life of the Tuareg*, described many of the diseases and epidemics that struck the region. However, the colonial perspective often dominated these historical accounts, ignoring the colonial factor and the dire social conditions of the local people under French rule. His good relationship with locals enabled him to interact closely with them, learning their language Tamasheq and their script Tifinagh, which he used to translate many medical and everyday terms relevant to these populations.

It is also worth noting that statistical data were absent regarding the number of infections or deaths from these diseases—likely due to the nomadic lifestyle of the Tuareg. Furthermore, information concerning Tuareg women's health was scarce in the book.

Duveyrier documented the most important traditional practices used by the Tuareg to face these diseases and showed how they utilized their experiences and environment to protect their health and that of their tribe an issue that will be explored in the final section of this work.

4- Methods of Healing and Traditional Treatments Among the Tuareg of the Hoggar:

The Tuareg society of the Hoggar managed to coexist with the harsh desert environment by confronting health challenges and diseases that afflicted their tribes. They explored the secrets of the desert and the natural resources it offered, leaving no herb or wild animal unused in treating their ailments. The Tuareg also made extensive use of amulets and magical incantations in their daily lives, forming a deep bond with them—a point emphasized by Henri Duveyrier in his book, attributing it to their ignorance of Islam and Sharia. ⁴²

Based on the diseases observed in the Hoggar region, we present the main traditional practices and remedies used by the local population to treat their illnesses, as described by the explorer Henri Duveyrier:

- The Tuareg treated "eye disease" (trachoma) by using kohl, which was widely applied by both men and women and purchased from Adrar and sold in Tamanrasset. ⁴³ They also used another remedy made by crushing alum and mixing it with goat's milk, then applying it as drops in the eyes for relief from pain and conjunctivitis.
- Snake and scorpion bites: Various methods were used. One involved cupping followed by applying a piece of animal skin to the affected area. Another method involved binding the wounded part and cauterizing it with fire, then placing chicken or goat skin to absorb the venom. ⁴⁴ Others would scratch the bite to draw out the poison. Dr. Vermale reported a more extreme method: opening a live dog's stomach and inserting the affected limb inside. For scorpion stings, butter was applied to the area, and the patient was made to lie down and sweat. ⁴⁵
- Measles: Treated by giving the child dates and butter, then covering him until sweating occurred and the rash disappeared.

- Fever was treated by slaughtering a goat, allowing its blood to pour over the patient's head and shoulders. Another method involved boiling local herbs to make a tea consumed regularly. Dr. Vermale also noted that porcupine or gazelle skin was used to treat fever.⁴⁶
- Hernia was managed by using belts during travel to alleviate pain.⁴⁷
- Whooping cough was treated by burying the sick child in hot sand to cover the entire body. If ineffective, cauterization was used on the chest, stomach, and shoulders. Another remedy included using "Arellachem" herbs in a metal container with hot stones; the patient inhaled the steam and then ate spicy food, covered themselves, and rested.⁴⁸
- Joint diseases were treated by rubbing the joints until bleeding, followed by cauterization and oil consumption, using olive oil and butter as compresses.⁴⁹ Duveyrier identified another remedy for bone diseases using the Arellachchem plant, harvested from rocky terrain, dried in a warm place, and mixed with dates or flour. The patient absorbed the mixture, covered themselves to sweat, and was massaged with melted butter.⁵⁰
- Smallpox was treated using "el-mella", where the patient was buried in hot sand until the rash disappeared. If the patient was a child, they were buried under a tent, accompanied only by a servant or a woman who had survived the disease—the mother was kept away for fear of infection. Doctors from the Pasteur Institute in their 1930 report noted that smallpox patients were isolated in remote locations, often alone or with an immune person. When the rash appeared, the patient would move to a well-ventilated, wind-sheltered area.⁵¹
- Skin diseases were treated by eating dates mixed with butter, or by isolating the patient in a hot sand pit until sweating removed the pustules. A former patient usually cared for the sick.⁵²
- Stomach and digestive diseases were treated with dried locusts mixed with dates and a little water. The Pasteur Institute of Algiers (1933) listed plant remedies such as propolis for indigestion, and *Teucrium polium* (takmezzout), crushed with sugar and mixed with water. This remedy was also used boiled in In Salah.⁵³
- For cold, chest pain, and flu, the Tuareg prepared sheep head stew with pepper and dried onions and made the patient sweat under heavy clothes.⁵⁴ They also used the herb "Selouf", scientifically known as *Periploca laevigata*, to treat coughs and colds.⁵⁵
- Thin women who wanted to gain weight ate wet meat, stayed in bed wrapped tightly to sweat, and drank large amounts of curdled milk, gradually gaining weight. For lice, they burned clothing to kill the parasites. Scabies (ahiod) was treated with butter-based ointments rubbed on the infected area.
- When traditional remedies failed, the Tuareg turned to sorcerers or marabouts (from Touat and Tidikelt), who wrote amulets and magical texts to treat madness, hysteria, and nervous attacks.⁵⁶ These talismans were believed to protect against the evil eye, possession, and disease, especially for children. They were placed in leather, copper, or silver pouches and hung around the neck, hands, or feet.

This type of treatment was a real gamble—it could heal or kill—because talismans could be used for revenge. However, it was considered a necessary practice in Tuareg society at the time.⁵⁷

The marabouts had immense influence over Tuareg minds. People wandered from one marabout to another seeking relief, wasting time on invalid incantations and false rituals, gaining only emotional comfort. In contrast, French clinics were often empty due to mistrust in European medicine; locals would only visit them if marabouts approved it, legitimizing the treatment in their eyes.

Fragrant products were also used to expel evil spirits, treating various forms of mental illness. To drive away hallucinations and nightmares, large amounts of frankincense (jawī) were burned to fill the patient's tent with strong vapors. A cloth soaked in this vapor was placed on the patient's head, causing dizziness and sleep.⁵⁸

For epilepsy, the Tuareg held rituals with dancing and loud music, inducing a trance-like state in the patient until collapse. They were then given a mixture of dates and herbs. If the patient became aggressive, they were tied in a tent and made to

drink peppery water, while incense was burned to aid recovery. They believed dancing expelled evil spirits and incense burned them out.⁵⁹

The Tuareg used various animal-based remedies, such as the gazelle (ahenkad), the Barbary sheep (aoudad), and the she-camel (talmat).⁶⁰ Gazelle meat was useful for osteoporosis, rheumatism, and anemia. Its intestines, when dried and cooked with soup, treated diabetes. Barbary sheep meat, once dried, treated cold-related illnesses and rheumatism. Its heated horns produced oil for back and joint pain. Camel products treated digestive issues, allergies, and asthma.⁶¹

Thus, French explorers and officers who visited the Tuareg and wrote about them promoted the image of Tuareg people as superstitious and reliant on sorcery, attributing it to their isolation and lack of religious knowledge. French figures like Duveyrier spread these ideas to portray the Tuareg as primitive and keep them socially and culturally isolated.

Yet Duveyrier meticulously documented the preparation of herbal remedies, their uses, and the therapeutic value of local animals. Some French doctors even used these traditional practices to treat their soldiers, conducting scientific research into their effectiveness—offering strong evidence for the efficacy of indigenous medicine.

Despite their harsh living conditions, the Tuareg resisted disease and epidemics with traditional medicine, passed down through generations and preserved as part of their simple, nature-based lifestyle, making full use of the region's botanical and animal resources.

5. Conclusion:

During the colonial period, the Hoggar region experienced numerous dangerous diseases and epidemics, resulting from a combination of social and environmental conditions specific to the southern territories. These areas were characterized by a nomadic lifestyle that paid little attention to essential health standards. Additionally, the arrival of the French in the region led to the introduction of several foreign diseases from overseas.

Despite these internal and external challenges, the inhabitants of Hoggar sought to resist the various illnesses and epidemics that struck the region and spread rapidly across all segments of society, causing numerous fatalities. In the face of this dire situation, the local population endeavored to alleviate the impact of these diseases by utilizing the natural resources available to them both plant-based and animal-based in treating and mitigating various ailments.

They held firmly to the traditional healing knowledge and practices inherited from their ancestors, rejecting treatment in French hospitals and clinics. This stance served as a form of resistance and defense of their cultural heritage. These traditional practices drew the attention and admiration of many European travelers and explorers, who went on to document them in numerous books and foreign sources.

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² A German traveler born in Hamburg on May 19, 1821, he studied at the University of Berlin (1839-1844), where he focused on philosophy, philology, and paleontology. He obtained his PhD in philosophy in 1845. A passionate traveler and walker, he roamed the shores of the Mediterranean Sea on foot and learned Arabic. This led the English Society to contact him to organize trade in Sudan and the Sahara. See: Ibrahim Miyassi, The French Expansion in the Southwestern Algerian Sahara (1881-1912), Publications of the National Museum of the Mujahid, 1996, p. 48. See also: Attilio Mori, Travel and Geographic Exploration in Libya, trans. Khalifa Mohammed Tillisi, Al-Furjani Library, Tripoli, 1971, p. 47.

³ Ismail Al-Arabi, The Great Sahara and Its Shores, National Book Company, Algeria, 1983, p. 82. See also: Abdelrahman Tchajji, The Turkish-French Conflict in the Great Sahara, trans. Ali Azzazi, Publications of the Center for the Study of Libyan Jihad Against the Italian Invasion, Libya, 1982, p. 70.

⁴ Abdelkader Merjani, *ibid.*, p. 37.

⁵ Hassan Marmouri, The Tuareg Between Traditional Authority and French Administration at the Beginning of the Twentieth Century, Publications of the High Council for the Arabic Language, Algeria, 2010, p. 158.

⁶ A city located in southern Algeria, about 400 kilometers away, stretching along the right bank of Oued Mzab, which flows from the Amour Mountains westward and heads east. It occupies a strategic location as a crossing point for trade caravans from east to west and from north to south, and it contains a fortress formerly used as a military barracks. See: Ibrahim Miyassi, The French Occupation of the Algerian Sahara 1830-1934, Houma Publishing, Algeria, 2005, p. 85.

⁷ An oasis in the Libyan Tripolitanian desert, also known as “Radames.” In ancient times, it was called “Sidamus,” a Berber city whose founding date is uncertain according to Ibn Khaldun. For more, see: Taher Ahmed Al-Zawi Al-Tarabulsi, *Dictionary of Libyan Cities*, 1st ed., Al-Noor Library, Tripoli, Libya, 1968, pp. 241–242.

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⁹ Baqlabeb Lalla Setti and Salmi Tin Hinan, *Militant Positions in the History of the Algerian Sahara: Tidikelt and the Hoggar (1826–1962)*, Rasail Publishing and Distribution, 2022, p. 41. Also see: Ibrahim Miyassi, *The Expansion of French Colonialism in the Southwestern Algerian Sahara*, op. cit., pp. 52–55.

¹⁰ **Henri L'Hôte**, *The Tuareg of the Hoggar*, Scientific Library, 2nd edition, revised and expanded, Payot Publishing, Paris, 1955, p. 379.

¹¹ Nacerdine Saidouni and Moawia Saidouni, *The Algerian Sahara Through French Reports in the Mid-19th Century*, Al-Basair Al-Jadida Publishing and Distribution, Algeria, 2019, pp. 467–468.

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¹⁵ Abdelrahman Badawi, *Encyclopedia of Orientalists*, 3rd edition, Dar Al-Ilm Lilmalayin, Beirut, p. 165.
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¹⁶ Paul Vermale, *In the Sahara During the European War*, Jacques Gandini Publishing, Paris, 1955, p. 260.

¹⁷ Iyad Younes Aribi and Afraa Atta Abdelkarim Al-Rais, "Customs and Traditions of the Tuareg Community in the Great Desert," *Middle East Research Journal*, Ain Shams University – Cairo, No. 02, 2019, p. 26.

Also: Henri Duveyrier, previous reference, p. 433.

¹⁸ G. Grenoilleau, *Encyclopedia of the French Empire, Colonial and Maritime Encyclopedia*, p. 189.

¹⁹ Saliha Allama, "Health Conditions in Algeria During the French Occupation (1830–1962)," doctoral dissertation in modern and contemporary history, Department of History, Faculty of Humanities and Social Sciences, University of Tlemcen, academic year 2016–2017, p. 200.

²⁰ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Scientific Media Library of the Pasteur Institute, Volume 8, Year 1930, Algiers 1930, p. 238.

²¹ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Volume 8, Year 1933, Algiers 1933, pp. 468, 470.

²² Henri Duveyrier, previous reference, p. 434.

André Roger Voisin, *The Souf: A Study*, El Walid Publishing, El Oued, Algeria, 2004, p. 289.

²³ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1930, previous reference, p. 226.

²⁴ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1930, previous reference, p. 227.

a. Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1933, previous reference, pp. 471, 503.

²⁵ It appears as red spots on the skin that turn into very hard blisters. If untreated, it suppurates, leaving disfigurement on the face and may cause disabilities such as blindness or deafness, and can even lead to death. Symptoms include high fever, severe headache, vomiting, diarrhea, and skin rash especially on the hands and face. Children are the most affected group. See:

– Saliha Allama, previous reference, p. 126.

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– Antoine Caron and Laurence Alvodo, *Medical Dictionary*, Larousse Publishing, 1989, “Smallpox,” p. 1014.

²⁶ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1930, previous reference, pp. 225–226.

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²⁸ Zubaidi Mubarka and Mohamed Abdelraouf Thamer, "Diseases and Epidemics in Southeastern Algeria During the Colonial Period Between 1900-1962 (Biskra - El Oued - Ouargla)," *Researcher Journal in Human and Social Sciences*, Vol. 14, No. 1, published 31/01/2023, p. 198.

²⁹ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1933, previous reference, p. 505.

³⁰ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1933, previous reference, pp. 468, 470.

³¹ Considered one of the infectious and dangerous diseases transmitted through sexual contact. Symptoms include hair and tooth loss, ulcers of the nose, mouth, and genital areas. It was known as the "Roumi Disease" and caused social embarrassment. French doctors attributed its spread to lack of hygiene. See: Mostafa Khayyati, *Medicine and Doctors in Algeria During the Colonial Period*, ANEP Publishing, 2013, p. 133.

³² Henri Duveyrier, previous reference, p. 435.

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³³ Paul Vermale, previous reference, p. 206.

³⁴ Among them: diarrhea, dysentery, infantile enteritis. Digestive system diseases include all inflammations affecting the stomach and large intestines, caused by bacteria from contaminated food or water, or by contact with infected individuals.

³⁵ Zubaidi Mubarka and Mohamed Abdelraouf Thamer, previous reference, pp. 203-204.

- Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1936, previous reference, p. 218.

³⁶ Also called malaria or jungle fever. It is an infectious disease transmitted through stagnant and contaminated water. Symptoms include chills, fever, and sweating. Caused by parasitic infection of red blood cells. See:

- Layla Jibril, "Swamp Fever: Causes and Treatment," *maqall.net*, published 3 July 2021, accessed 20/08/2024 at 19:57.

³⁷ Henri Duveyrier, previous reference, p. 431.

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³⁹ Yamina Mujahid, previous reference, p. 244.

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⁴¹ Saliha Allama, previous reference, p. 200.

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⁴⁷ H. Bissuel, *The French Sahara*, previous reference, p. 165.

⁴⁸ Henri Duveyrier, previous reference, pp. 419, 430.

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⁴⁹ Amal Hashemi, *The Social and Intellectual Condition of the Hoggar Tuareg Through French Writings at the Beginning of French Occupation of Algeria*, Master's thesis, University of Oran, 2007-2008, p. 117.

⁵⁰ Henri Duveyrier, previous reference, pp. 430, 437.

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- ⁵² Amal Hashemi, previous reference, p. 119.
- ⁵³ Source: gallica.bnf.fr, Archives of the Pasteur Institute of Algeria, Year 1933, previous reference, pp. 494-495.
- ⁵⁴ Amal Hashemi, previous reference, p. 117.
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