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Toward a Pharmaceutical Anthropology in Morocco: The Biography of Aureomycin from Physical Production to Cultural Reinterpretation**

نحو أنثروبولوجيا صيدلية بالمغرب: بيوغرافيا دواء الأوريوميسين من الإنتاج المادي إلى إعادة التأويل الثقافي

Abstract: Pharmaceutical anthropology calls for moving beyond the conventional divide between folk remedies and modern pharmaceuticals and applying the same analytical lens to both. The biographical approach to objects helps to understand the various transformations and interactions that govern a medicine within a specific context. This study traces the life story of Aureomycin in Morocco from its initial introduction, through physical production, marketing, and distribution, to consumption. It shows that the medicine had not been used as its producers had anticipate. It has rather been subject to the logic of "pharmaceutical heretics" who treat Aureomycin as a folk remedy and integrate it into a new, intermediary treatment process that is neither fully modern nor wholly traditional.

Keywords: Pharmaceutical Anthropology; Biography of Medicine; Aureomycin; Morocco; Folk Remedies.

ملخص: يتطلب الحديث عن أنثروبولوجيا للصيدلة تجاوز النظرة التقليدية التي تميز بين الأدوية الشعبية والسحرية والأدوية العصرية والاعتيادية، والانتقال إلى دراستها كلها بالنظرة نفسها. إنّ اعتماد المقاربة البيوغرافية للأشياء يندرج في هذا الإطار، ويساعد على فهم التحولات والتفاعلات المختلفة التي تحكم دواءً ما في سياق زمني واجتماعي معين. من هذا المنظور، تعكف الدراسة على تتبع سيرة حياة دواء الأوريوميسين في المغرب بداية من السياقات التي ظهر فيها مرورًا بإنتاجه المادي، ثم عمليات التسويق والتوزيع وصولاً إلى الاستهلاك. أظهر هذا التتبع أنّ الدواء لا يستخدم بالطريقة التي يتوقعها الفاعلون المنتجون، بل يخضع لمنطق الهراطقة الصيدليين الذين يجعلون منه دواءً شعبيًا وجزءًا من عمليات علاج جديدة، ليست عصرية كليًا ولا شعبية تمامًا، بل هي بينية.

كلمات مفتاحية: أنثروبولوجيا صيدلية؛ بيوغرافيا الدواء؛ الأوريوميسين؛ المغرب؛ الدواء الشعبي.

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Introduction: The Biography of Things and the Process of Commoditization

From an anthropological perspective, biography – whether viewed as a metaphor, a process of inquiry, or a negotiated construction between writer and subject – is a cohesive yet hybrid concept. that accounts for subtle and nuanced contexts.[1] This study adopts a relatively modern type of biography: the biography of things. The nature of this type is best illustrated by the process of enslavement, as defined by Igor Kopytoff. Slavery begins with the sale or capture of an individual, stripping them of their social identity and reducing them to a thing or a potential commodity. The process continues as the enslaved person is re-situated within a new social context upon their incorporation into their master's household.[2] Igor Kopytoff writes: "This biographical consideration of enslavement as a process suggests that the commoditization of other things may usefully be seen in a similar light, namely as part of the cultural shaping of biographies".[3]

This study is particularly concerned with medicines, designed for exchange and are subject to a continuous process of commoditization. Their social meanings vary depending on the contexts in which they are used. Unlike the commoditization of a slave, however, a medication is subject to what Kopytoff terms "terminal commoditization" – the same logic that the Catholic Church once adopted in its sale of indulgences. A sinner could purchase forgiveness for himself alone but was not permitted to resell it to others. In modern medicine, terminal commoditization is enforced by law: the resale of prescribed medications, or the sale of any medicine without proper licensing, is prohibited. This is because a medication is viewed as a terminal commodity, intended for a specific patient, under specific conditions, and not transferable beyond that designated use.[4]

This is not to suggest that drugs lack complex histories. Each medication is the product of a tortuous journey shaped by chance discoveries, logical and intuitive analysis, spectacular ingenuity, personal ambition, and fierce corporate competition.[5] As the case of aspirin demonstrates, the history of a drug often reflects the interplay of diverse yet interconnected factors.[6] Accordingly, any model for understanding the history of pharmaceuticals should account not only for individual behaviours but also for institutional structures, socio-historical dynamics, and their interactions over time.[7]

The biography of pharmaceutical drugs refers to the sequence of transformations a medicine undergoes. At different stages, the various actors involved give these substances a history.[8] The process begins with the drug's manufacture within a specific scientific and technological context. It then moves to the stage of distribution, where the product is transferred to specialized retailers such as pharmacists, physicians, or vendors. Marketing follows, during which the drug is sold to consumers, either through prescription or over the counter in pharmacies. Once the drug reaches the consumer, it enters the final stage of its life, where it is used to restore, improve, or maintain health. This stage is crucial; improper use renders the drug worthless, while proper use grants the drug a kind of "life after death", enhancing the consumer's health and achieving the purpose for which it was originally manufactured.[9]

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[1] David Zeitlyn, "Life-History Writing and the Anthropological Silhouette," *Social Anthropology/Anthropologie Sociale*, vol. 16, no. 2 (2008), p. 167.

[2] Igor Kopytoff, "The Cultural Biography of Things: Commoditization as Process," in: Arjun Appadurai (ed.), *The Social Life of Things: Commodities in Cultural Perspective* (Cambridge: Cambridge University Press, 2013), p. 65.

[3] Ibid.

[4] Ibid., p. 75.

[5] Diarmuid Jeffries, *The Remarkable Story of a Wonder Drug* (Philadelphia: Chemical Heritage Foundation, 2008).

[6] Ibid.

[7] David Cohen et al., "Medications as Social Phenomena," *Health*, vol. 5, no. 4 (2001), pp. 448-449.

[8] Sjaak van der Geest, Susan Reynolds Whyte & Anita Hardon, "The Anthropology of Pharmaceuticals: A Biographical Approach," *Annual Review of Anthropology*, vol. 25 (1996), p. 156.

[9] Sjaak van der Geest & Kerry Chamberlain, "Researching the Life Stages of Medicines," *Medische Antropologie: Journal about Culture and Health*, vol. 23, no. 2 (2011), p. 232.

Although the life cycle of pharmaceuticals can be carefully planned, medicines eventually lead lives of their own, independent of pharmacists and physicians.[10] This is what might be termed the "secret life of pharmaceuticals" – an existence that runs parallel to their formal one, beginning the moment a drug leaves the pharmacy and enters informal circulation.[11] This passage is also a transition in mindset. As a drug moves from a scientific context into local or personal contexts, it becomes subject to forms of local, experiential knowledge. At the intersection of market techniques and everyday cultural habits, a new pharmaceutical mindset emerges.[12]

This study explores the "biography" of one of the widely known and commonly used medications in Morocco: Aureomycin ointment, popularly referred to as "yellow pomade". It traces the antibiotic's origins and circulation in Morocco, addressing how its uses have expanded beyond the purposes envisioned by pharmacists and scientists. The study then undertakes a content analysis of various prescriptions, recipes, and uses shared on YouTube to understand these consumption patterns. Although similar content appears across various online platforms, YouTube provides distinct advantages: its view counts provide a measure of reach and influence, while its capacity for longer, monetizable videos makes it an attractive space for content creators to disseminate their "inventions" and novel uses of Aureomycin.

Pre-Production: The Making of Morocco's Best-Known Ointment

When French colonialists first arrived in Morocco in 1912, the local population was widely afflicted with several serious illnesses, notably eye diseases such as trachoma and conjunctivitis. These conditions affected not only the poor but all social classes. For example, Prince Mawla Abd al-Salam, the son of Sultan Sidi Muhammad b. Abdalla, nearly lost his sight to an eye disease before being treated by a British physician.[13] Upon her arrival in Morocco in 1913, one French physician was astonished to see entire processions of the blind walking through the streets with their hands on each other's shoulders or collectively carrying a stick, chanting prayers in pursuit of alms.[14]

Adding to the tragedies endured by those afflicted, a powerful stigma surrounded eye diseases in Morocco, often pushing individuals to the margins of society. Edward Westermarck notes that Moroccans believed it was a bad omen to encounter a blind or half-blind person in the morning, as it evoked associations with Satan or the Antichrist, figures traditionally imagined as one-eyed. Similarly, if someone happened to meet a blind person, whether in one eye or both, they were advised to return home and take a nap; otherwise, they would fail whatever they intended to do.[15] Eye diseases in Morocco thus carried cultural associations, perhaps linked to deeper anxieties surrounding the power of the evil eye.

For the French, who sought to exploit the region's human resources, infectious eye diseases were merely another obstacle to their goal of controlling the population with minimal cost and effort. French authorized a range of treatments for ophthalmia and trachoma, conditions that, as one doctor noted, afflicted the majority of inhabitants in some regions.[16] These medications included petroleum jelly, cocaine eye drops, and chaulmoogra oil, the latter already used to treat swellings associated with leprosy.[17] The availability

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[10] Sjaak van der Geest, "Anthropology and the Pharmaceutical Nexus," *Anthropology Quarterly*, vol. 79, no. 2 (Spring 2006), p. 307.

[11] Anne M. Lovell, "Addiction Markets: The Case of High-Dose Buprenorphine in France," in: Adriana Petryna, Andrew Lakoff & Arthur Kleinman (eds.), *Global Pharmaceuticals: Ethics, Markets, Practices* (Durham, NC: Duke University Press, 2006), pp. 155-156.

[12] Geest & Chamberlain, p. 234.

[13] Bujumaa Ruyan, *al-Ṭibb al-Kūlūnyālī al-Faransī bi-l-Maghrib 1912 - 1945* (Rabat: Manshurat al-Ribat.net, 2020), p. 264.

[14] Ibid., p. 374.

[15] Edward Westermarck, *Ritual and Belief in Morocco*, vol. II (New York: University Books Inc, 1968), p. 13.

[16] Ruyan, p. 376.

[17] Ibid., p. 375.

of eye medications increased significantly once French authorities ordered their distribution on a scale similar to that of quinine for malaria.[18] In 1933, the French authorities and the Moroccan health department published a booklet in French and Arabic titled *Help Us Combat Trachoma*. The booklet described the disease, explained how it spread, and provided guidance on prevention and treatment.[19] This represented an early attempt to disseminate knowledge about diseases and their treatment to the wider Moroccan population.

Trachoma persisted among the Moroccan population for many years, with little progress toward its containment. However, between 1952 and 1953 a joint action program was launched through the combined efforts of the Moroccan government, the World Health Organization (WHO), and UNICEF. The main objective of this joint program was to develop an effective, cost-efficient model for the collective treatment of trachoma in Morocco.[20]

Between 1954 and 1958, clinical trials were carried out in various educational institutions in Marrakech and Meknes, as well as in rural areas around Tiznit, to determine the effectiveness of a particular antibiotic known as chlortetracycline in treating trachoma.[21] While most English-language texts refer to the antibiotic as chlortetracycline, this study follows the convention found in French texts and uses its brand name, Aureomycin.[22]

The importance of Aureomycin in treating eye diseases and infections became apparent from the very first clinical trials. Throughout 1953 and 1954, the ointment was dispensed to residents of the Skoura region along with instructions for self-treatment.[23] Between 1954 and 1955, and again between 1964 and 1966, various methods of mass treatment for trachoma were adopted in Kelmima. These included applying 1% Aureomycin ointment to the eyes twice daily for three consecutive days, with the cycle repeated monthly throughout the conjunctivitis season, from June to November.[24]

To bring conjunctivitis under complete control, Aureomycin was distributed more widely across the southeastern areas of Morocco, particularly in villages in the Ouarzazate region with which the residents of Skoura maintained contact. Individuals who had gained experience using the antibiotic were dispatched to these areas to help reduce the severity of seasonal infections by sharing their knowledge of the medicine and its application.[25]

These trials, conducted throughout Morocco, confirmed the importance of Aureomycin in treating both trachoma and seasonal conjunctivitis. In better-equipped, modern schools, administering Aureomycin three times a day for 60 days produced recovery rates of up to 80%. Under the same conditions, the frequency of topical application could be reduced from three to two times daily without diminishing its therapeutic efficacy. This experiment demonstrated that that a lengthy, strict, and costly treatment schedule was unnecessary. These experiments paved the way for expanding Aureomycin-based treatment throughout Morocco.[26] Given the limited material and human resources available, the government considered a self-

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[18] Ibid.

[19] Ibid., p. 377.

[20] J. Reinhards et al., "Studies in the Epidemiology and Control of Seasonal Conjunctivitis and Trachoma in Southern Morocco," *Bulletin of the World Health Organization*, vol. 39, no. 4 (1968), pp. 499-500.

[21] Ibid., p. 500.

[22] Gian Battista Bietti, "Progrès de la chimiothérapie et de l'antibiothérapie du trachome: Épreuves d'efficacité, nouveaux produits, traitement intermittent," *Bulletin of the World Health Organization*, vol. 28, no. 4 (1963), p. 401.

[23] Reinhards et al., p. 525.

[24] Ibid., p. 500.

[25] Ibid., p. 528.

[26] J. Reinhards, A. Weber & F. Maxwell-Lyons, "Collective Antibiotic Treatment of Trachoma: Report on Comparative Trials Leading to More Economic Methods of Treatment," *Bulletin of the World Health Organization*, vol. 21, no. 6 (1959), p. 699.

treatment approach not only practical but necessary. Consequently, local residents took responsibility for purchasing and using the antibiotic, bolstering optimism about the program's viability.[27]

Discovery and Production: The First Chapter of Aureomycin's Biography

Many medicines in Morocco, particularly costly prescription drugs for specific illnesses like cancer, have limited social lives beyond their intended medical use, rendering any "biography" of them predictable and unremarkable. Aureomycin, by contrast, has led a far more complex and unpredictable life, in part due to their long history among the Moroccans, and in part due to their relative affordability for all social classes.

One of the challenges in writing the biography of medications lies in the limited access social scientists have to the worlds of pharmaceutical companies.[28] The life story of Aureomycin itself began in the United States shortly after World War II, when Lederle Laboratories hired Professor Benjamin Duggar to find an effective anti-malarial agent. Soon after joining the company in 1945, Duggar discovered a fungus that produced a powerful yellow antibiotic, later marketed as Aureomycin.[29] In 1948, Duggar announced his discovery in an article published in the *Annals of the New York Academy of Sciences*.[30] In 1951, the French pharmaceutical company Rhône-Poulenc began producing Aureomycin in cooperation with the US-based Lederle Company.[31]

Duggar's discovery was not clearly defined at first, as it showed potential for treating a variety of conditions. Serious interest in Aureomycin as a possible treatment for trachoma emerged around 1950. Although early trials of Aureomycin eye drops involved only a small number of patients,[32] subsequent experiments conducted on larger groups quickly confirmed its effectiveness. Its positive effects appeared quickly than that of previously used medications.[33] As known in Morocco today, Aureomycin is primarily an ointment. In its early phases, however, it appeared in various other forms, such as eye drops, capsules,[34] and a powder, the latter of which was discovered to be more painful.[35] Ultimately, Aureomycin proved effective across every form.[36] In Morocco, the trachoma-control program sought to achieve the best possible outcome at the lowest cost. The ointment proved to be the most practical form for health officials to provide clear instructions for self-treatment.[37]

During this phase of the medication's life story, the actors operated behind the scenes. They were largely economic and political actors seeking to achieve their objectives through technology and biomedicine. As such, they approached the medication as a commodity and discounted its symbolic and material importance, as their central concern was profit. To lend a profit motive to science and medical technology, these actors worked to create a space that enabled exchange between the scientific and industrial sectors.[38]

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[27] Ibid., p. 537.

[28] Geest & Chamberlain, p. 234.

[29] Thomas H. Jukes, "Some Historical Notes on Chlortetracycline," *Reviews of Infectious Diseases*, vol. 7, no. 5 (1985), pp. 702-703.

[30] Benjamin Duggar, "Aureomycin: A Product of the Continuing Search for New Antibiotics," *Annals of the New York Academy of Sciences*, vol. 51, no. 2 (1948), pp. 177-181.

[31] André Frogerais, "Les origines de la fabrication des antibiotiques en France," *Hal Open Science* (2015), p. 20.

[32] Arthur Joseph Boase, "Aureomycin in Trachoma," *The British Journal of Ophthalmology*, vol. 34, no. 10 (1950), p. 627.

[33] Ibid., pp. 631-632.

[34] Stewart Duke-Elder, Derek Ainslie & Arthur James Boase, "Aureomycin in Ophthalmology: A Preliminary Report," *The British Journal of Ophthalmology*, vol. 34, no. 1 (1950), p. 30.

[35] Toulant et al., "Essais de traitement du trachome par l'auréomycine et la chloromycétine," *Bulletin de L'académie Nationale de Médecine*, vol. 135, no. 5-6 (1951), p. 81.

[36] Renald Ching, "Aureomycin in the Treatment of Trachoma," *AMA Archives of Ophthalmology*, vol. 45, no. 6 (1951), p. 659.

[37] Reinhards et al., p. 525.

[38] Paul Rabinow, *Making PCR: A Story of Biotechnology* (Chicago: The University of Chicago Press, 1996), p. 10.

The Cultural Construction of Meaning and the Process of Commoditization

The Material, Cultural, and Symbolic Structure of Aureomycin

Sjaak van der Geest and Kerry Chamberlain emphasize the importance of studying pharmaceuticals anthropologically as cultural objects that, beyond their medical function, carry social, spiritual, commercial, and political dimensions.[39] Pharmaceuticals circulate as commodities, but what makes an object a commodity? A commodity is an item that possesses value and can be exchanged for something of equivalent value. During the exchange process, both the item being sold and the item offered in return function as commodities.[40] A pharmaceutical, then, is doubly characterized. On the one hand, it is an object that can be traded and exchanged; on the other hand, it leads a life of its own, one that shifts in critical ways depending on the contexts in which it circulates and the actors controlling it.[41]

During the marketing phase of a pharmaceutical's life story, the primary actors are current consumers, former users, or those who benefit directly from selling the product. However, before addressing the economic dimension, it is important to recognize the cultural construct that renders this object – a pharmaceutical – a desirable commodity. Although the trade in medicines is deeply embedded in society, it was long overlooked as a topic worthy of anthropological analysis. For instance, while there might be a little interest in studying the use of aspirin for headaches in a particular community, the use of elephant dung to treat dizziness might appeal far more intriguing simply because it appears exotic.[42] Thus, any discussion of pharmaceutical anthropology must begin with a deliberate effort to "denaturalize" the accustomed view of pharmaceuticals.[43]

A pharmaceutical is a cultural artifact, an embodiment of shared beliefs, expectations, and experiences, and a point of contact among the various actors who engage with it. According to David Cohen et al., today's pharmaceuticals function in many ways like modern talismans and amulets. This is not to deny their scientific and medical importance; rather, it indicates that, from an anthropological perspective, their material properties are less central than the meanings they convey within the complex network of historical events and social interactions.[44]

In Morocco, Aureomycin was introduced in the form of an ointment rather than as capsules or drops for social and economic reasons. The ointment aligned with a cost-effective collective treatment campaign: once the uninterrupted treatment schedule was adopted, the required dosage per case could be reduced from 18 grams to as little as 3-6 grams.[45] Additionally, applying the ointment did not require the presence of specialists, unlike eye drops, for example, which require precision in preparation and administration.[46] This illustrates how even the material form of a medication can have social and economic justifications, and how understanding these justifications helps us reconstruct the drug's symbolic and cultural dimensions. Pills and capsules, for instance, do not carry the same significance as injections, drops, or ointments. Each form of medication, depending on its temporal and spatial context, acquires its own symbolic and cultural significance.

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[39] Geest & Chamberlain, p. 231.

[40] Kopytoff, p. 68.

[41] Susan Reynolds Whyte & Sjaak van der Geest (eds.), *The Context of Medicines in Developing Countries: Studies in Pharmaceutical Anthropology* (Dordrecht: Springer Netherlands, 1988), p. 4.

[42] Ibid., p. 9.

[43] Ibid., p. 10.

[44] Cohen et al., p. 449.

[45] "The Treatment of Trachoma," *Medical Journal of Australia*, vol. 1, no. 25 (June 1960), p. 984.

[46] Ching, p. 657.

The symbolic dimension of a pharmaceutical is the meaning consumers attribute to it before using it. For an individual to decide to take a medication, they must first possess prior knowledge about it. In most cases, such knowledge is shaped less by medical or pharmacological sources than by social networks and the broader cultural environment. Nonetheless, this knowledge often originates, at least in part, from health-related propaganda disseminated by official bodies. In Morocco, during the mass trachoma-treatment campaign, Aureomycin was introduced as a medical substance together with instructions for proper use.[47] But did people follow these instructions? Did they use the medication in the manner the institutions intended, and for the conditions these institutions sought to treat?

These questions can barely be addressed with certainty for the past. However, presently, Aureomycin has become one of the best-known medications in Morocco since its introduction decades ago, used across a spectrum of medical specializations. As its use has expanded, it has not simply replaced local folk remedies; rather, it has become incorporated as one of their ingredients.[48]

The Commoditization of Aureomycin and Its Trade Networks

Historically, the commodification of Aureomycin coincided with its popularization, by making it widely available at minimal cost and in numerous locations across Morocco.[49] Certain pharmaceuticals in the country were indigenized that they were sold in stores and markets alongside everyday items. As a result, they began to be used – contrary to medical protocol – in keeping with specific cultural practices: pills were crushed into powders and applied to wounds, certain remedies acquired distinct local names, or pharmaceutical labels were borrowed for locally-made, non-pharmaceutical treatments.[50] In the case of Aureomycin, its "indigenization" resulted from logistical factors, such as the colonial authorities' attempt to control diseases even in remote regions far from major centres. To this end, they relied on informal distribution networks that reached the outermost points of the Moroccan map, such as tobacconists.[51]

As Aureomycin continued to circulate among the population, it became accessible through various channels, most notably through specialists who distributed the ointment free of charge, or through market vendors who sold it at very low prices. For example, a 5-gram tube could be purchased for 30 francs (USD 0.06).[52] Grocery stores and tobacco dispensaries in Morocco continue to sell various medications today, reflecting what might be termed "democratization of the pharmacy". This does not mean that medications are easily obtained or equally available to everyone, but rather that pharmacists do not hold an exclusive monopoly over them and people can obtain certain drugs without passing through formal channels. A prime example is the Fallah Market in the city of Oujda,[53] where a variety of medications is sold at prices far lower than those charged by pharmacies, and without requiring a prescription.[54] Aureomycin can also be obtained through social networks: from a neighbour who only used half a tube, or from a friend who keeps a reserve "just in case". In recent years, social media platforms such as Facebook have hosted groups in which members request medication from each other – either because pharmacy prices are prohibitively high or because certain drugs are unavailable. Within these groups, users exchange medications, send

[47] Reinhards et al., p. 523.

[48] Nina L. Etkin, Paul J. Ross & Ibrahim Muazzamu, "The Indigenization of Pharmaceuticals: Therapeutic Transitions in Rural Hausaland," *Social Science and Medicine*, vol. 30, no. 8 (1990), p. 919.

[49] Hicham Nhaili, "La législation pharmaceutique au Maroc durant le protectorat Français (1912-1956)," PhD. Dissertation, Université Mohammed V, Faculté de Médecine et de Pharmacie, Rabat, 2014, p. 72.

[50] Hilbrand Haak & Anita P. Hardon, "Indigenised Pharmaceuticals in Developing Countries: Widely Used, Widely Neglected," *The Lancet*, vol. 332, no. 8611 (1988), p. 621.

[51] Ruyan, pp. 350-351.

[52] Reinhards et al., p. 538.

[53] Farouk Tahri, "al-Ṭibb al-Ḥayawī bi-Waṣfihi Ṭibban Shaʿbiyyan Ladā l-Marḍā al-Nafsiyyīn wa-ʿĀʾilātihim: Dirāsa fī Iʿādat Intāj al-Waṣfāt al-Ṭibbiyya Khārij al-Mustashfā fī al-Maghrib," *Omran*, vol. 12, no. 48 (Spring 2024), p. 41.

[54] Ibid., pp. 41-42.

and receive them, and even suggest substitutes in comment threads, all without consulting a physician or pharmacist, and without any medical prescription.

Thus, the commodification of Aureomycin unfolded alongside health authorities' efforts to reduce reliance on costly human resources and to implement public health programs at the lowest possible cost. Popularization and commodification advanced in tandem, gradually shifting the medication away from the field of biomedicine.[55]

Only limited and superficial information is available about the company currently responsible for manufacturing and distributing Aureomycin ointment in Morocco. Operating under the name Promopharm Ltd., the company is located in the industrial zone of Sajel in Had Soualem, Casablanca. Incorporated in August 1947, it is described as "a public company listed on the Casablanca Stock Exchange since June 2007". It specializes in pharmaceutical products, biotechnology, and biology, with a focus on skincare and beauty products.[56]

The company appears to make no efforts to market the medication in Morocco. In fact, 1% Aureomycin sold in the country lacks even basic instructions for use inside the package, and it is currently unavailable in various stores and markets. After disappearing from the Moroccan market for several years, the ointment later re-emerged – sold at a high price and only in limited quantities in pharmacies – yet still available over the counter. This stands in contrast to countries such as France, where Aureomycin requires a doctor's prescription and is supplied with detailed instructions for use and a list of potential side effects.[57]

The Final Chapter in a Medication's Biography: Is It Achieving Its Intended Purpose?

Pharmaceutical Heresies: Biomedicine and the General Public

Biomedicine, particularly in its pharmaceutical form, represents a kind of orthodoxy that, given its exactitude, assumes patients' will to adhere to instructions that are sometimes strict. This sort of "dictatorship" has characterized biomedicine since its outset. During the French colonial period in Morocco, for example, when doctors doubted whether patients would take their medications as prescribed, they gathered in central locations and supervised the swallowing of each pill.[58] This might be termed "pharmaceutical orthodoxy": the set of precise instructions deemed necessary to achieve the therapeutic effects envisioned by the medicine or the prescribing doctor. Yet, as history has demonstrated, no orthodoxy exists without corresponding heresies.

The treatment of heretics differs according to the sphere to which they operate. A religious heretic may face execution at the hands of the dominant orthodoxy; a political heretic may be threatened with arrest or even assassination; and a social or economic heretic might end up being ostracized and deprived of the means to earn a livelihood. But what becomes of the scientific heretic? Nothing, as it happens. Even the most formidable and widespread scientific orthodoxies are incapable of confronting and eliminating their heresies.[59]

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[55] Etkin, Ross & Muazzamu, p. 923.

[56] "Pharmaceutical Revival Company in Morocco," *Maʿlūmāt Mubāshir*, accessed on 7/8/2024, at: https://acr.ps/1L9zRqE

[57] This was confirmed to the researcher personally.

[58] Ruyan, p. 353.

[59] Donald Goldsmith (ed.), *Scientists Confront Velikovsky*, Isaac Asimov (fore.) (New York: W. W. Norton Company, 1979), p. 7.

There are two types of scientific heretics. The first emerges from within the scientific community itself, and may be called the "endoheretic". The second comes from outside the scientific community and can be termed the "exoheretic". The exoheretic enjoys greater immunity from the sanctions that scientific orthodoxy might attempt to impose.[60] In general, the endoheretic receives little public attention, and rarely benefits materially from their heresy. The exoheretic, by contrast, tends to attract significant attention and support, and may even derive material benefit from the heresy.[61] This dynamic is especially evident in the profits earned through advertising on YouTube channels, where pharmaceutical heretics post their ideas. Social media platforms have thus enabled pharmaceutical heresies to spread more rapidly and easily than before.

Attributing "inappropriate" uses of medications solely to ignorance or illiteracy is a reductionist conclusion. The problem is fundamentally cultural.[62] Popular therapeutic systems will not simply absorb Western pharmaceuticals as they are; rather, they reinterpret their function within local conceptual frameworks before granting them legitimacy.[63] This is known as indigenization. When biomedicine is indigenized, it is shifted into a category of social relationships which differs radically from those assumed by orthodox Western therapeutic protocol; namely, the relationship between patient and specialized health professional.[64] For instance, outpatients with mental illnesses speak frankly of the indigenization of biomedicine when they turn a doctor's prescription into a folk remedy, retaining the medications that suit them and abandoning those that do not. Instead, they replace these prescribed medications with treatments such as exercise, smoking cannabis, or other substitutes.[65]

Such cases represent explicit forms of pharmaceutical heresies. The anthropologist's task is to understand the non-pharmaceutical mindset in using medications in order to move beyond the one-dimensional perspective that rests exclusively on orthodox therapeutic approaches. Only then does it become possible to view medications and their purposes from the perspective of individuals who maintain a traditional mentality, and to identify the factors that promote, justify, and perhaps even explain these various patterns of use.[66]

Indigenization of Antibiotics: Aureomycin as a Cure for All Ailments

Two types of Aureomycin are available on the Moroccan market: one for the eyes and another, more concentrated, for the skin. The ocular formulation, however, is better known, as evidenced by the terminology Moroccans use to describe it: *būmāḍā dawā al-ʿaynayn* (eye ointment),[67] or "the yellow pomade" in reference to the colour of its packaging.

The need for a medical prescription to obtain Aureomycin in France has helped regulate its use and limit practices that deviate from orthodox medical and pharmaceutical protocols. In Morocco, by contrast, a few dirhams are enough to purchase Aureomycin from the nearest pharmacy, or even from informal sources. However, does Aureomycin still fulfil its intended as a medication – that is, as a treatment for eye and skin conditions?

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[60] Ibid., p. 8.

[61] Ibid., p. 12.

[62] C.H. Bledsoe & M.F. Goubaud, "The Reinterpretation of Western Pharmaceuticals among the Mende of Sierra Leone," *Social Science and Medicine*, vol. 21, no. 3 (1985), pp. 258.

[63] Ibid., p. 262.

[64] Susan R. Whyte, "Pharmaceuticals as Folk Medicine: Transformations in the Social Relations of Health Care in Uganda," *Culture, Medicine and Psychiatry*, vol. 16, no. 2 (1992), p. 173.

[65] Tahri, p. 48.

[66] Cohen et al., p. 445.

[67] An Arabization of the French word *pommade*, this word is used in Morocco to refer to any viscous ointment that can be rubbed onto the skin for curative purposes.

To answer this question, the study analyses a selection of YouTube videos in which Aureomycin is presented not only as a treatment of a variety of conditions but also as a solution to a range of cosmetic problems. The internet has played an important role in enabling consumers to share their experience and expertise, contributing to "knowledge-building" around medications. This marks a radical shift. In the past, knowledge concerning the therapeutic uses of pharmaceuticals was available exclusively through health specialists, governments, and companies.[68] However, the new pharmaceutical heretics have transformed the landscape to their advantage, democratizing access to the pharmaceutical field.

Despite being an antibiotic, Aureomycin is often treated much like Vaseline or the many moisturizers sold on the beauty market, applied with the belief that it possesses countless therapeutic powers. Such attributions of expansive healing properties are not unique to Morocco. In Sierra Leone, for example, people have used Mentholatum on their faces and hair to warm themselves when afflicted with what they call "cold fever". Others, including highly educated individuals, have drunk the ointment dissolved in warm water, based on their belief that the fever inhabits the abdomen.[69]

Tetracycline is another antibiotic that many Africans believe can treat virtually any condition. It is noteworthy that Tetracycline and Aureomycin belong to the same class of antibiotics, and the former is referred to locally by a term that literally means "a cure for all". In biomedical terms, however, Tetracycline is only for acne and skin inflammations. In Burkina Faso, residents attribute an expansive therapeutic capacity to Tetracycline, claiming it can cure everything from stomach aches to backaches, toothaches, wounds, headaches, malaria, and diarrhoea. Sold in the form of capsules, Tetracycline's contents are poured onto wounds, placed in cavities of aching teeth, or mixed with all sorts of beverages.[70]

Antibiotics are indigenized most particularly when they are believed to produce rapid results, and when they have been unavailable for long periods.[71] This is true of Aureomycin.

Aureomycin and Medical Heresy: YouTube and the Indigenization of Antibiotics

The research method employed in this study is known as virtual ethnography, an approach based on engagement with virtual communities and the observation of their online interactions and activities.[72] However, relying on the YouTube platform for investigating Moroccans' uses of Aureomycin does not exempt the need for in-depth field research. Studying a digital community alone is insufficient;[73] it must be connected to, and grounded in, social reality.

With the rise of digital communities, the observation process has become twofold: it now involves both the physical observations of social life in its material and digital dimensions, and the online observation of its electronic expressions "netnography".[74] The dual processes of socio-electronic interaction and the automatic digital documentation that accompanies them transform the digital space into a living, dynamic and open archive, where data is preserved at the moment it is produced.[75] YouTube offers particular advantages: it allows access to all publicly posted videos, in addition to comments and likes, unlike platforms such

[68] Ibid., p. 454.

[69] Bledose & Goubard, p. 267.

[70] Sjaak van der Geest & Susan Reynolds Whyte, "The Charm of Medicines: Metaphors and Metonyms," *Medical Anthropology Quarterly*, New Series, vol. 3, no. 4 (December 1989), p. 352.

[71] Haak & Hardon, p. 621.

[72] Mahjuba Qawqaw, "al-Mujtamaʿ al-Iftirāḍī wa-Ishkāliyyat Tajdīd Manhaj al-Baḥth al-Sūsyūlūjī: Naḥw Bināʾ Namūdhaj li-Dirāsat al-Tafāʿulāt al-Iliktrūnīyya bi-Wāsiṭat al-Ḥāsūb," *Omran*, vol. 8, no. 29 (Summer 2019), p. 94.

[73] Christine Hine, "Ethnographies of Online Communities and Social Media: Modes, Varieties, Affordances," in: Nigel G. Fieldinget, Raymond M. Lee & Grant Blank (eds.), *The SAGE Handbook of Online Research Methods* (California: Sage Publications, 2017), p. 412.

[74] Mahjuba Qawqaw, "al-Nitnūghrāfīyā Manhajan li-l-Baḥth al-Sūsiyūlūjī wa-l-Anthrūbūlūjī: Min al-Mulāḥaẓa al-Iliktrūniyya ilā Iʿādat Kitābat al-Athar al-Raqmī," *African Social Dynamics: The African Journal of the Human and Social Sciences*, no. 5 (2023), p. 24.

[75] Ibid., p. 29.

as Facebook, where access to groups is limited to members, and where stringent admission criteria are sometimes imposed.

Analysing YouTube content and tracking views and comments to assess the extent to which Aureomycin has been indigenized in Morocco is less a methodological innovation than a restoration of methods familiar to earlier sociologists,[76] albeit applied to a new research community: the digital community. Relying on the knowledge of pharmaceutical heretics on YouTube by people seeking to care for their bodies suggests a decline in the power of the medical and pharmaceutical elite and introduces new risks to people's health, most notably, the growing potential for antibiotic resistance. According to the World Health Organization, this presents a real threat to humanity.[77]

We chose videos that addressed Aureomycin and its various uses in Morocco over a relatively short period of time. The earliest video was posted in April 2019, the latest in November 2021.

Table (1): Moroccan Content Creators' Videos Using Aureomycin

No. of likes	No. of views	Date posted	Title
17,000	609,738	22 April 2019	The secret of my clear complexion is a 9-dirham pomade. Get rid of acne and scars, and people will ask you what your secret is. In 3 days …
364	25,558	6 June 2021	Yellow pomade can cure internal and external haemorrhoids from the very first use.
8,800	583,030	25 February 2022	Yellow pomade can treat nail fungus and tooth decay, leaving you as good as new without a doctor. All I ask for in return is your prayers.
1,500	47,453	8 November 2021	Yellow pomade will whiten teeth in seconds, I swear to God. Rub your teeth with it, and yellowing and calcium deposits will disappear.
621	31,037	11 October 2021	Get a flat stomach in 3 days with the miracle of yellow pomade. Melt away belly fat and that "rubber tire" for good without …
6,500	342,403	25 July 2022	I swear to God, with yellow pomade, your hair will grow in thick and never fall out again. No more bald patches, and …

Source: Prepared by the author.

Taken together, these videos garnered more than 1.5 million views and up to 35,000 "likes" over only three years. In their titles, Aureomycin is referred to as "yellow pomade" or simply "pomade". The language used to describe its effects often reflects a kind of magical thinking, with repeated references to the "miracle" ointment's effects. However, the most striking feature is the use of an eye ointment to treat a vast array of unrelated medical conditions.

In one of the videos, Aureomycin is presented as an effective cosmetic treatment for achieving "clearer, more beautiful skin",[78] which is precisely the purpose of Aureomycin 3% ointment. What is noteworthy, however, is that the "influencer" portrays Aureomycin as performing the same function as folk preparations, only in the form of an ointment originating from biomedicine. The irony lies in her harsh criticism of doctors for not adopting Aureomycin as a treatment for complexion problems, an omission she interprets

[76] Qawqaw, "al-Mujtamaʿ al-Iftirāḍī wa-Ishkāliyyat Tajdīd Manhaj al-Baḥth al-Sūsyūlūjī," p. 98.

[77] "Muqāwamat al-Muḍāḍḍāt al-Ḥayawiyya," *World Health Organization*, 31/7/2020, accessed on 10/5/2024, at: https://bit.ly/4b5XfGo

[78] Rajoua Channel, YouTube, 22/4/2019, accessed on 7/8/2024, at: https://bit.ly/4k3Q1Hm

as evidence of a medical monopoly designed to push high-price pharmaceuticals. In this narrative, the influencer positions herself as "fighting" to provide people with the most effective treatment at the lowest cost, which is already available in abundance. She states frankly, "I want to offer you something that is available to everyone, and to help other women take care of themselves with something simple and within easy reach".

In the second video, the influencer proposes Aureomycin 1% as a treatment for haemorrhoids,[79] embedding it within a regimen that makes the antibiotic appear as if it belongs to the realm of folk medicine. The prescription is as follows: "Take a spoonful of Aureomycin 1% and a few drops of olive oil and mix them well. Then add a pinch of turmeric, preferably hand-ground. Place the mixture inside a piece of fabric or cotton and pass it over the affected area". She further advices a rigorous treatment schedule to achieve the desired outcomes: "The prescription should be used regularly even after recovery". In the comments section, a woman asks whether she can use this prescription while eight months pregnant. The YouTuber responds that this is "all right". In doing so, the influencer presents herself as an experienced expert capable of determining what is appropriate for each individual case. This is a vivid example of medical heresy in practice, in which biomedicine overlaps with folk medicine, and the folk healer becomes a physician or pharmacist in their own right.

One researcher notes that to stay in business, folk healers are obliged to adjust to ongoing advances in the healthcare field. One of the most important types of adjustment is the incorporation of pharmaceuticals into their repertoire of folk treatments.[80] In another video, an influencer recommends using Aureomycin 1% as a treatment for nail fungus.[81] As in the previous example, the YouTuber introduces Aureomycin into an otherwise purely folk remedy. The preparation method is described as follows: "First, take two cloves of red garlic and rub them into a paste. Then add a teaspoon of either regular or apple cider vinegar and half a teaspoon of table salt. Then add the Aureomycin 1%". To use the mixture, "place the vinegar and salt in a container of warm water, soak your hands or feet (that is, the affected nails) in the solution for five minutes, then take them out and dry them. After this, trim the nails as short as possible, place the mixture onto the affected nail or nails, and wrap it/them in cellophane. The mixture should preferably be left on overnight. For best results, the process should be repeated daily".

The YouTuber in this video emphasizes the need to adhere to the method she proposes, warning that any deviation will cause the treatment to fail. She repeatedly insists that she is not speaking "out of the blue" but from personal experience. One of the key factors in building a solid relationship between a community and a given medication is the ability to replicate the practices being promoted and obtain the same results.[82]

In the next video, Aureomycin is proffered as a treatment for yellowing teeth.[83] Once again, it is incorporated into a folk remedy, described as follows: "Put about two spoonfuls of apple cider vinegar in a container and add any toothpaste of your choice. Add a pinch of powdered miswak and a bit of ground cloves. In a separate container, mix a little bit of Aureomycin 1% with the miswak power and olive oil and mix them all together". The instructions continue: "Brush your teeth with the first mixture, then place the second mixture on a piece of aluminium foil and wrap it around your teeth". The choice of Aureomycin for this purpose may be influenced by the ointment's yellow colour. Similarly, a yellow pharmaceutical pill is used as a folk remedy for malaria, which turns one's urine bright yellow. The idea, then, is that this yellow

[79] Khadiju Buyuti, YouTube, 7/6/2021, accessed on 7/8/2024, at: https://bit.ly/410Wb24

[80] Ivan Wolffers, "Traditional Practitioners and Western Pharmaceuticals in Sri Lanka," in: Whyte & Geest (eds.), p. 47.

[81] ʿĀlam Ajmal al-Nisāʾ, YouTube, 26/2/2022, accessed on 7/8/2024, at: https://bit.ly/414FPpi

[82] Bledose & Goubaud, p. 263.

[83] Moroccan Women's Beauty Secrets, YouTube, 8/11/2022, accessed on 7/8/2024, at: https://bit.ly/3EIG5Tp

pill knocks out the disease by "fighting fire with fire".[84] In the same vein, red medications are believed to have the capacity to purify or even build up the blood.[85]

In the next video, Aureomycin incorporated into a prescription for weight loss and the reduction of excess body fat:[86] "Put a teaspoon of Aureomycin 1% in a container, add a teaspoon of garlic oil and a teaspoon of lemon oil, then mix well. It is best to avoid Aureomycin 3%, because it is intended for acne; for weight loss, one should use Aureomycin 1%, which is intended for the eyes. Fill a cup with boiling water; add a teaspoon of anise leaf and another teaspoon of anise seed, one cinnamon stick, and two spoonfuls of lemon juice. Then cover the mixture to prevent its benefits from evaporating with the water". Directions for use continue: "Rub the area where the fat loss is desired with the first mixture, then wrap the area in cellophane. After this, drink the second mixture after straining it to make the prescription effective".

This video represents a particularly "extreme" form of medical heresy, as it openly attacks the medical field. It claims to be strict, rejecting the Aureomycin ointment intended for acne, while endorsing the use of the ointment specifically intended for eye conditions. In so doing, it implicitly acknowledges the medication's officially intended purposes (i.e. to treat acne and eye conditions) while simultaneously disregarding them by repurposing the ointment for an entirely different goal: removing body fat. Additionally, it affirms the belief that the benefits of the medication "will evaporate" if the mixture is not covered, offering a popular reformulation of pharmacists' insistence that medications remain covered or in closed containers to remain safe and effective.

Online influencers have given folk medicine an aura of strictness and austerity reminiscent of orthodox biomedicine, while simultaneously making biomedicine a complementary part of folk medicine. In so doing, they have achieved the ultimate indigenization of the modern medicine.

Pharmaceuticals are generally perceived as more powerful and effective than folk medicines and herbs because they act quickly to alleviate symptoms and treat diseases. However, this very "power" carries a negative aspect: the side effects that may result from the shock such substances inflict on the body. By contrast, folk medicines and natural herbs act more slowly and gently, addressing ailments without producing unwanted side effects.[87] Hence, efforts to combine biomedicines with folk remedies may be seen as an attempt to reduce the risks of biomedicine while at the same time augmenting the effectiveness of folk medicine. As such, the activities of the new pharmaceutical heretics offer a meeting point between the two fields which, in their view, offers the "ideal treatment".

This point of convergence is illustrated in a prescription for strengthening hair and treating baldness, presented in a video that received more than 300,000 views.[88] The recipe is as follows: "Place a teaspoon of tea powder in a sealable glass bottle, then add a teaspoon of powdered fenugreek leaves and a teaspoon of zaatar, and stir the mixture well. Next, add a teaspoon of ground cloves and a small amount of olive oil or vegetable oil. To this mixture, add Aureomycin 1%, preferably avoiding Aureomycin 3%, and stir the mixture well again. Close the bottle tightly and place it in boiling water for five minutes. After this, cover the bottle well with aluminium foil and place it far from sunlight for 12 days. Stir the mixture daily until it is thoroughly homogeneous, at which point it will be ready to use". The instructions for use are as follows: "Once a week, apply some of the mixture to the scalp and leave it on all night, then wash your hair well the following morning".

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84 Bledose & Goubaud, p. 264.

85 Ibid., p. 269.

86 Moroccan Women's Beauty Secrets, YouTube, 11/10/2021, accessed on 7/8/2024, at: https://bit.ly/4b7B6rA

87 Linda K. Sussman, "The Use of Herbal and Biomedical Pharmaceuticals on Mauritius," in: Whyte & Geest (eds.), p. 206.

88 Moroccan Women's Beauty Secrets, YouTube, 25/7/2020, accessed on 11/11/2024, at: https://acr.ps/1L9zRPw

This recipe is a striking embodiment of medical heresy. It illustrates how the kitchen becomes a scientific laboratory where new medications are produced using a mixture of plant substances, common folk remedies, and a modern pharmaceutical originally intended as an eye medication. The rigour demonstrated in the choice of time period (stirring the mixture daily for exactly 12 days) and the specification to apply it once a week serves to give the prescription a "pharmaceutical" character. Within this context, it becomes impossible to speak of a "modern medicine" on the one hand, and a "folk" or "traditional" medicine on the other. Rather, one might say that folk medicine has been pharmaceuticalized, or alternatively, that the pharmaceutical or biomedical field has been indigenized, such that the modern can no longer be separated from the traditional. It may be therefore most appropriate to view all available medications as elements within a single cultural system.[89]

All the content creators discussed here agree that Aureomycin is effective in treating a wide variety of conditions. However, they go further, accusing physicians and pharmacists of deliberately concealing the power of Aureomycin to sell more costly medications. This highlights a particular role these heretics claim for themselves: they present their work as a just cause against a ruthless orthodoxy, positioning themselves as the sole defenders of ordinary people and as bearers of revolutionary knowledge.[90] Their message is clear: while elitist biomedicine can be rejected, its discoveries can be appropriated within folk medicine. In this context, Aureomycin is no longer simply a product of biomedical progress; it becomes a component in a broader repertoire of folk remedies. The importance of biomedical pharmaceuticals is acknowledged, but the elite that decides how they are to be used is roundly rejected.

Conclusion

Whatever their form and degree of importance, all objects, including medications, are potentially subject to both commoditization and individualization. In other words, just as an object can be commoditized, it can also be de-commoditized by being imbued with unique qualities that distinguish it from other things. Moreover, an object that is not subject to this logic in one realm may become so in another.

The ideal commodity is one that can be readily exchanged for something else, and the ideally "commoditized" world is one in which everything is tradeable and everything is for sale. By contrast, the most de-commoditized world is one in which all things are individualized and distinct, and therefore not subject to exchange at all.[91] Medications complicate this vision. Even after a medication is individualized – or de-commoditized – by being withdrawn from the sphere of trade or exchange,[92] it could revert at any moment to being exchangeable. It can be given as a gift or loan, or even resold. The dream of every business is for its products to reach a stage of terminal consumption.[93] Yet in the case of medications, this is impossible.

In addition to functioning as "ideal commodities", medications also possess remarkably dynamic lives. The life story of a medication might differ from one consumer to another, and from one geographic context to the next. From the perspective of pharmaceutical anthropology, what matters is not primarily the relationship between patient and physician or healer, but the domain of traditional healing, where people treat themselves using medications they believe to have particular effects.[94]

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89 Bledose & Goubaud, p. 277.

90 Vuk Stambolovic, "Medical Heresy – The View of a Heretic," *Social Science and Medicine*, vol. 43, no. 5 (1996), p. 602.

91 Kopytoff, p. 69.

92 Ibid., p. 74.

93 Ibid., p. 75. Terminal consumption has been defined as the act of acquiring and possessing material goods purely as an end, rather than as a means to achieve true well-being.

94 Whyte & Geest (eds.), p. 5.

The broad availability of medications has had a liberating effect, enabling ever greater number of people to care for themselves. The intensity of this "therapeutic liberation" is particularly notable in societies where medications circulate freely, without oversight or restrictions.[95] Moreover, this growing availability of medications has become directly linked to the gradual loosening of pharmaceutical establishment, which has led gradually to their indigenization and incorporation into local cultures.[96]

Aureomycin, an ideal case study in this regard, began its life in the United States as a powerful yet relatively obscure antibiotic. It then made its way to Morocco through a large-scale program to combat trachoma, and today it serves as a potential treatment for a wide variety of conditions. Consumers began independently redefining its uses, prescribing it for themselves and others to treat a wide range of ailments. consumers began independently redefining its uses, prescribing it for themselves and others to treat a wide range of ailments.

It is within this context that a new type of heresy – medical heresy – emerges. As this study demonstrates, this form of heresy condemns biomedicine and the pharmaceutical industry as fields that exercise a powerful ideological hegemony which is rooted in an elitist perspective, scientifically sanctioned, and globally dominant.[97] Today's heretics are no longer isolated and scattered; instead, they have become producers of discourse that create different meanings that challenge those advanced by prevailing modernist and scientific discourse.[98] This has come about through the internet, which has reversed the direction of the information flow in the medical field,[99] enabling the creators of medically heretical content to earn large profits and gain widespread fame.

Today's heretics craft new medical prescriptions that are neither modern nor traditional, blending herbs and natural substances commonly used in folk remedies with biomedicines to treat a wide variety of conditions. In doing so, they erase the boundaries that once separated these two fields, transforming the kitchen into a new laboratory for the manufacture of remedies that go beyond classical categories of treatment. Modern medical heretics represent an alternative mentality that reflects not only health concerns, but also social, political and economic concerns.[100] Influencers speak regularly in their videos about the high cost of modern medicine and accuse physicians and pharmacists of colluding to drain Moroccans' pockets even when orthodox medical treatment might be significantly easier, cheaper and faster-acting. Medical heretics cast themselves as saviours who offer the solutions most appropriate for people. Hence, their moral authority rests not on duty, but on an ethos of empathy with others.[101]

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[95] Geest & Whyte, p. 348.

[96] Haak & Hardon, pp. 620-621.

[97] Akile Gürsoy, "Beyond the Orthodox: Heresy in Medicine and the Social Sciences from a Cross-Cultural Perspective," *Social Science and Medicine*, vol. 43, no. 5 (1996), p. 580.

[98] Stambolovic, p. 601.

[99] Cohen et al., p. 455.

[100] Geest, Whyte & Hardon, p. 166.

[101] Stambolovic, p. 602.

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