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From Colonial Medicines to Global Pharmaceuticals? The Introduction of Sulfa Drugs in French Vietnam

Laurence Monnais

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Abstract In the decade between 1935 and 1945, the discovery and diffusion of sulfonamides, commonly known as sulfa drugs, new medicines capable of controlling bacterial infections, launched a true therapeutic revolution. Predating antibiotics, these "first miracle drugs" to quote the title of John Lesch's latest book (The First Miracle Drugs. How the Sulfa Drugs Transformed Medicine, OUP, 2007), met with huge successes in both civilian and military applications, thus stimulating a rapid expansion of pharmaceutical research and production, raising expectations of medicine in general and accelerating the appearance of new and powerful medicines created via research. In this paper, I examine the introduction of sulfa drugs in a colonial Southeast Asian setting, French Vietnam. First, I focus on when and how (through what channels) these drugs were introduced in the country, and assess the medical results of their introduction. I then look at the acclaim these products—symbolised by Rhône Poulenc Dagenan®—inspired locally, particularly in the urban settings where they were most accessible. The multiple factors behind this popular success are surely complex. Two which stand out are: first, the long standing collusion between the French pharmaceutical industry, the Pastorian Institute, the colonial government and the public network of hospitals run by its agents within the system of Indigenous Medical Assistance (Assistance Médicale Indigène) and second, the growing familiarisation of Vietnamese people with Western, efficient (and toxic), specific medications, thus promoting a process of therapeutic selection (and indigenisation of medical practises) as well as an enduring appropriation of Western scientific and industrial techniques that would prove crucial during 35 years of war. Examining an important therapeutic innovation at the level of day-to-day practise, this paper intends to participate to a much-needed historicisation of the pharmaceuticalisation of the developing world and of Southeast Asia, a historicisation that will insist on the colonial dimensions of the practise of science, the versatility of the biography of pharmaceuticals and the historical roots of therapeutic choices currently made in Vietnam.

L. Monnais (✉)
Center for East Asian Studies (CETASE), Université de Montréal, C.P. 6128 Succ. Centre-ville, Montreal, Quebec, Canada
e-mail: laurence.monnais-rousselot@umontreal.ca

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1 Introduction

Between 1935 and 1945, the discovery and diffusion of sulfonamides, commonly known as sulfa drugs, launched a veritable therapeutic revolution. Predating antibiotics, these new medicines acted effectively against various bacterial infections; they were acclaimed as the "first miracle drugs" and used widely in both civilian and military applications. Their international success stimulated a rapid expansion in pharmaceutical research and production, thus accelerating the introduction of new active drugs, and, more broadly, raising expectations of scientific medicine.

In this article, I examine the introduction of sulfa drugs in a colonial Southeast Asian setting, French Vietnam. I begin by describing when and how these drugs were introduced to the country and reports of their local experimental and therapeutic uses. Particularly striking are various expressions of the popular success of these products—of which Rhône Poulenc's Dagenan was the best known—among Vietnamese consumers. The multiple factors behind this popularity are complex, but three stand out. I first consider the possible influence on the Vietnamese reception of sulfa drugs of alliances between the French pharmaceutical industry, the Pastorian network, the colonial government and its network of public hospitals and, more broadly, of the emergence, in the Interwar period, of new channels for the mass distribution of pharmaceuticals. I then move onto an analysis of the process by which the Vietnamese became familiar with Western medications—especially effective but often toxic medications with specific antimicrobial effects—and appropriated some Western techniques, particularly injections. I argue that this gradual familiarisation, which predated the introduction of sulfa drugs, had an impact not only on the reduction of morbidity and mortality rates but also on individual and collective therapeutic choices. Finally, I address the role in shaping Vietnamese patient agency of a significant gap between what colonial healthcare offered the Vietnamese and what they wanted and expected to consume. These three issues played an important role in shaping not only the reception of sulfa drugs in the late 1930s, but also, more broadly, the Vietnamese history of modern pharmaceuticals from the First to the Second World War.

By focusing on the diffusion of a significant Western therapeutic innovation to a non-Western setting, this paper aims to contribute to a much-needed historicisation of the *pharmaceuticalisation* of the developing world and of Southeast Asia. Such a historical analysis reveals the impact of the colonial period on current scientific practise and therapeutic choices in Vietnam, as well as the multidimensionality of the biography of pharmaceuticals.

1.1 Colonialism, Medicines and Sulfonamides

Contrary to several recent analyses (Chast 1995; Greene 2006), I suggest that the period from the late nineteenth century to the 1940s was crucial for the history of medicines. It was during this time—particularly the Interwar period—that we see the

emergence of a new conception of medicines as techno-scientific objects and a rapid re-definition and multiplication[1] of both their identities and material forms. These transformations foreshadowed our current everyday use and perception of medicines (Gaudillière 2005).

1.1.1 Modern Medicines in the Metropole and the Colonies

From the late nineteenth century, pharmaceutical production became increasingly standardised, perfecting the material forms we are now familiar with (pills, tablets, vials for injections, etc.). Advances in chemistry, in synergy with the development of industrial pharmaceutical manufacturing—a business that was becoming increasingly organised, powerful, and trans-national—accelerated the development and diffusion of new synthetic compounds. As a result, the first therapeutic classes were delimited and a rapidly growing number of medical and commercial specialties were commercialised (Chauveau 1999: 53–59).[2] A shift in therapeutic paradigms was also taking place during this period; therapeutic choices, formerly centred on patients' individual specificity, were increasingly made on the basis of the specificity of drug action (Collin 2006: 129–51). This period was also marked by a growing emphasis on efficacy, quality (and stability) and safety as the key criteria for judging medicines, especially through the formalisation of clinical therapeutic trials (Edwards 2007). These criteria were soon held up as standards for launching new therapies on the market.

This period especially appears as a watershed when we take into account the efforts made by actors implicated in the cycle of pharmaceuticals (Van der Geest et al. 1996) to stake out their professional territory. Pharmacists in particular, but also doctors, sought and obtained new prerogatives; these would have a significant impact on the future of modern medicines and on the modalities of their distribution. In the French context, the accumulation of legislative restrictions on the distribution of medicinal substances defined as 'toxic' was clearly a product of professionalisation movements spearheaded by these two groups of actors (Léonard 1981; Faure 1996). From the second half of the nineteenth century, only qualified pharmacists were authorised to manipulate and sell toxic substances, and only under a doctor's prescription. Yet, although medicines were rapidly being "modernised," they were not considered by the medical community as the 'weapon of choice' for health management until the 1910s (Faure 1996). Western health policies prioritised public health and hygiene; that is, 'upstream' (preventive) over 'downstream' (curative) interventions. This tendency was reinforced by the acceptance of bacteriological theories and the prominence of Pastorianism in France. In addition, it must be

[1] It is estimated that there were about 25,000 pharmaceutical specialties in 1930, in contrast with only 8,500 in 1989 (Dillemann et al. 1992).

[2] A commercial specialty can be defined as a remedy that was based on a formula inspired by the Codex, sold in pharmacies without a prescription and widely advertised to the general public. By contrast, the medical specialty is characterised as scientific, usually sold on prescription only. Its scientific and modern character was ascribed either to the novelty of its active substance, a new mode of preparation or presentation or a new combination of formerly known active principals.

pointed out that, before the introduction of arsenical drugs in the 1910s, there were only a handful of really effective medicines with a specific curative action.[3]

Given this preference for preventive medicine, it is not surprising that pharmaceuticals initially played a marginal role (and only later become important) in the medicalisation[4] of French Indochina (1887–1954), and, more generally, of modern colonial empires.[5] Indeed, the interventions making up colonial medicalisation would centre on prevention and health education, targeted at both individuals and the collective. Their underlying logic rested in part on the perceived need to fight a particularly hostile—and still quite unfamiliar—pathological environment, but also on the central role given to science, medicine and doctors in 'civilising,' by educating populations judged to be inferior. Promoting massive recourse to therapeutics was not seen as compatible with this mission to civilise Vietnamese society. Besides the fact that Western pharmaceuticals had not proven particularly valuable locally, there was the idea that encouraging recourse to pharmaceuticals constituted an "easy way" out of health problems that were seen as rooted in Vietnamese patients' way of life,[6] as well as an implicit approval of their ancestral health practises, which relied largely on drug-based therapeutics. Some colonial doctors clearly believed that the natives had to be "readied" before consuming modern medicines, a preparation process that included several stages. This was expressed by Dr. Reboul the Director of health services for Indochina in 1914, when he stated: "(…)To bring progress to a people, it is not sufficient (…) to distribute medicines; we must, beforehand, give more basic lessons to the childlike *Annamite* [Vietnamese]. We must teach him to build a cottage, and even more importantly to put aside some savings (…)" (Reboul 1914: 302).

The earliest public health initiatives in French Indochina consisted in smallpox vaccination campaigns and the creation of the first civilian hospitals in the 1860s. Their expansion into a large-scale healthcare policy came only with the political and administrative unification of the *Union Indochinoise* in 1887, which led to the creation of an independent budget for healthcare.[7] In 1905, Governor General Paul Beau officially established a public healthcare system designed to serve the needs of

[3] The term 'specific' is used here in its historical context. However, as Ross and Tomkins (1997: 398) have pointed it out 'selective' is preferable to 'specific' in modern medical usage. We should specify here that our definition of medicines excludes vaccines and serums.

[4] We consider medicalisation to be a historical process that must be reassessed critically and that both extreme narratives that dominate its history are in need of revision: the first depicting its past as overly dark (as a deculturation of the popular classes) and the second as overly rosy (as a triumph of science over superstition) (Faure 1998: 53–68). Thus medicalisation is considered as the product of an encounter between a complex offer of medical goods and services, and a diversified social demand that participates in defining its contours.

[5] From 1887, French Indochina was an administrative entity comprising five territories (one colony, Cochinchina, and four protectorates: Tonkin, Annam, Cambodia and Laos), governed by a Governor general who represented the French Republic.

[6] We find similar attitudes expressed in other contemporary colonial contexts (Anderson 2007).

[7] The independence of the Indochinese health budget would never allow it to be large enough to support the sanitary system that was envisioned. In 1913, this budget was worth 1.7 million piasters (Indochinese currency), in 1931, 3 million, which was equivalent to a maximum of 3.8% of the general budget of the colony. On average, half of this budget went towards the construction and maintenance of the sanitary infrastructure, 25% to environmental sanitation. The portion of the budget dedicated to materials, including the supply of pharmaceuticals, represented a maximum of 0.3% of the total budget (Monnais 1999: 80–82).

the indigenous population, the *Assistance Médicale Indigène* [Indigenous Medical Assistance or AMI]. Its priority was collective prevention, with a focus on public health measures targeting the principal epidemic and endemic diseases in Vietnam (smallpox, malaria, plague, dysenteries, etc.), as well as health education. However, this programme also included the development of a network of medical facilities that provided the first channels for the distribution of colonial medicines. From 1909, a state-run quinine programme [*Quinine d'État*] subsidised and managed the distribution of this anti-malarial for preventive as well as curative uses, provided at low or no cost according to each region's prevalence rate.

From the late 1910s, we see the emergence of a movement of autonomisation and indigenisation of the colonial healthcare system in Vietnam, characterised by attempts to adapt it to local, geographical, pathological, economic and cultural realities (Monnais 1999: 178–221). Healthcare policy adopted new goals: targeting "social diseases" (including infectious diseases such as syphilis, gonorrhoea, tuberculosis, pneumonia, trachoma, etc.) and expanding care for women and children. Such orientations were attended by a rise in specialised facilities, a renewed emphasis on the training of Westernised indigenous medical personnel, and the expansion of small rural facilities in order to broaden the diffusion of essential care into the countryside. The ruralisation of healthcare in Vietnam was accompanied by an effort to make pharmaceuticals available in areas where there no medical facilities existed; this opened up possibilities for therapeutic substances to be given a larger role in colonial healthcare. Evidence of this readiness can be found in the creation, in 1920, and development of a network of basic medicines stores [*dépôts de médicaments*].

By 1920, a growing and increasingly influential Western pharmaceutical industry was introducing increasingly numerous, reliable and effective synthetic products; this fostered a growing trust in therapeutics among Western healthcare professionals. In colonial discourses, we find an additional emphasis on the potential value of Western medicines as agents for extending the sphere of "French influence;" pharmaceuticals themselves were thus seen as potential 'civilising tools.'[8] Indeed, the Minister of Colonies Albert Sarraut declared in 1924, in a circular letter on the treatment of leprosy in the colonies:

> "(…) the main obstacle in the prevention of leprosy is the issue of treatment. There is no better prophylactic tool, because none other is more likely to have such a direct impact on the natives' outlook, than a truly active therapy (…) What attracts syphilitic patients and yaws sufferers to the dispensary are the extraordinary effects of arsenobenzols and bismuth salts (…)".[9]

It was in this context—characterised by political domination, the civilising mission and growing trust in therapeutics—that a series of legislative texts aimed to tighten the regulation of the importation and sale not only of pharmaceuticals but

[8] CAOM (Centre des Archives d'Outre-mer, Aix-en-Provence, France), RST NF (Fonds de la Résidence Supérieure du Tonkin, Nouveau Fonds) 3852, "Classement de la Province de Lang Son parmi les régions moyennement malariques, 1913"; RST NF 4024, "Rapport sanitaire annuel de la province de Ha Dong, 1925".

[9] "Circulaire du Ministre des Colonies au sujet de la prophylaxie et du traitement de la lèpre (24 mars 1924)" (reprinted in *Annales de Médecine et de Pharmacie Coloniales* (AMPC), 22: 125).

also of Sino-Vietnamese medicines. By 1905, only pharmacists, as defined by French professional standards, were authorised to import, manipulate, and sell the substances contained in an ever-growing list of toxic products (many of which entered into the composition of Sino-Vietnamese remedies), for which a medical prescription was now also obligatory. A 1908 law specified that both French and Sino-Vietnamese sites in which medicines were prepared and sold should be inspected regularly, including provisions for seizing medicines, levying fines and even imprisonment.[10] A 1914 bill called for the licencing of Sino-Vietnamese druggists and imposed on them metropolitan rules for dispensing therapeutic substances. Between 1916 and 1938, a series of rulings attempted to redefine Sino-Vietnamese medicine as a natural and inoffensive pharmacopoeia limited to the treatment of common and benign ailments.[11]

The development of this legislative framework was dominated by French definitions of safe and risky practises. It grew out of paternalistic concerns to protect public health, but also out of political, commercial and professional interests in maintaining the privileges of the French pharmaceutical industry and of Western-qualified pharmacists. It was in this restrictive legal context that the introduction and use of a certain number of Western, colonial medicines came to shape the process of medicalisation in Vietnam and its consequences for colonised patients. Three therapeutic classes confirmed the prominent role of chemotherapy (particularly for infectious diseases) in colonial medicine during the Interwar period: arsenobenzol drugs, synthetic anti-malarials, and then sulfa drugs, the first "miracle drugs," to quote the title of John Lesch's latest book (2007), also considered to be the first generation of antibiotics.

1.1.2 The First "Miracle Drugs"

By the turn of the twentieth century, the pharmaceutical industry, in collaboration with the chemical industry and early medical research—especially bacteriological—laboratories, was introducing the first effective synthetic medicines against various infectious diseases, thus ushering in the era of chemotherapy. The beginning of this era is generally associated with the discovery of "606" (an arsenical compound or arsenobenzol that was first commercialised under the trade name Salvarsan by Hoechst) by the German physician and bacteriologist Paul Ehrlich in 1909–1910. Identified as the first *"magic bullet"* (Parascandola 1997: 78–79), this compound was soon found to have a curative effect on diseases caused by trepanoma parasites

[10] ANVN (Archives Nationales du Viêt nam), centre n 1 (Hanoi), RST 48339, "Composition de la commission d'inspection des pharmacies, 1908–1909".

[11] Yet the majority of these laws were never enforced and Sino-Vietnamese medicines continued to be widely used by the population. In response to this enduring consumption of local medicines, but also to the limitations of the public healthcare system, particularly in terms of access to treatment, colonial authorities would eventually, after becoming a bit more familiar with Sino-Vietnamese medicine, provide a legal framework for its practise (CAOM, Gougal (Gouvernement Général) SE (Service économique) 213, "Réglementation de l'exercice de la pharmacopée traditionnelle sino-indochinoise, 1942–1943"). On the ambiguity of colonial processes of recognition and, to some extent, of appropriation of "traditional" health practises, see Hans Pols' article on Indonesia in this volume.

(such as syphilis) and trypanosomes (sleeping sickness).[12] In 1912, compound 914 (Néosalvarsan) confirmed the value of arsenobenzols.

Other researchers and laboratories soon became involved in this field, including the French chemist Ernest Fourneau, founding director of the *Laboratoire de chimie thérapeutique* [laboratory of Therapeutic Chemistry] of the Pasteur Institute in Paris that was established in 1911. Fourneau's appointment had been promoted by *Usines du Rhône* (Rhône-Poulenc) as a means of ensuring links between biological research and the chemical industry.[13] The progress of research on antibacterial medicines in Europe and in North America was accelerated by World War I: Eucupin, a derivative of cupreine for external use on wounds, was succeeded by Rivanol in 1920 and then by other derivatives of Acridine. In 1925–1926, thanks to the work of W. Roehl, the first synthetic anti-malarial, Plasmochine (Praequine), was commercialised. Meanwhile, work on the antibacterial action of dyes, studied by Ehrlich since the end of the 1890s, continued as well (Greenwood 2008: 52–65).

In 1927, as part of its efforts to modernise its laboratories, the German pharmaceutical cartel I. G. Farben recruited a young doctor, Gerhard Domagk, as the Director of its Institute of Experimental Pathology and Pathological Anatomy. He was given a precise mission: to find an anti-infectious agent that was effective in treating internal infectious diseases. As an experimental model, Domagk chose streptococci, a class of bacteria that caused various conditions, some of which were benign (ear and throat infections) but many also quite serious (meningitis, arthritis, puerperal fever, etc.). Phenazopyridin, an azoic dye that reddens urine, attracted his attention. Although not very powerful, this substance seemed nonetheless easy to use because it was non-toxic. Domagk then came up with the idea of grafting a radical sulfonamide (SO2-NH2, sulfonamides, like sulfones, are sulphured derivatives of aromatic cores) to this dye, inspired by techniques for setting dyes in wool. The success of this experiment launched the story of sulfonamides (Lesch 2007: 40–67).

In May of 1933, R. Foerster reported to the Congress of the Dermatological Society of Düsseldorf that a 10-month-old baby diagnosed with septicaemia caused by staphylococci had been cured by sulfamidochrysoidin (Streptozon). We do not know why Domagk did not publish his own results until February 1935; he did, however, apply for a patent for his compound in December of 1932 under the name of Prontosil. Since the patenting of medicinal compounds was not admitted by French law, the *Laboratoires Roussel* were able to launch Rubiazol, a replica of Prontosil, that same year (Bovet 1988: 87–88). The preventive and curative effects of these products on all acute and chronic conditions caused by streptococci, staphylococci, coli bacilli, etc. were soon widely acknowledged. Systematic research on these drugs was continued at the Laboratory of Therapeutic Chemistry in Paris,

[12] It was not, however, the first specific medication, nor the first effective arsenical compound. The French researcher A. Béchamp can be credited with having synthesised the first organic derivative of arsenic in 1859–1960; this compound would later be commercialised under the trade names Atoxyl and Trypoxyl (Chast 1995: 80).

[13] This collaboration was based on a contract in which Rhône Poulenc agreed to supply raw materials, and obtained in exchange exclusive rights on the sale of specialties generated by the laboratory (with the exception of vaccines). This collaboration is analogous to that between the Ehrlich Institute in Frankfurt and the drug firm Hoechst.

which was still directed by Fourneau. The laboratory was thus able to discover why Prontosil was inactive in vitro and to isolate sulfanilamide, a component of Protonsil that, although not itself a dye, was identified as its active principle. Sulfanilamide was soon commercialised under several trade names including Septazine (46 R.P.) and Septoplix (1162 F). Although initially slow (Bovet 1988: 68–69),[14] the marketing of Septoplix was soon highly successful. Admired for the rapidity and regularity of its therapeutic efficacy, which some clinical studies had shown to be greater than Rubiazol or Septazine, the product was described as "particularly effective" in treating erysipelas, gonococcal infections, lymphogranuloma venereum, chancroid, urinary tract infections, streptococci meningitis and suppuration, puerperal fevers and tropical lymphangitis (Vidal 1940: 1686–87).[15]

Meanwhile, research on several derivatives of sulfanilamide, aimed at modifying its antibacterial as well as pharmacokinetic properties, was also undertaken. In 1937, the British firm May and Baker, associated with Rhône Poulenc,[16] launched Sulfapyridine (M & B 693), which was commercialised in France under the name of Dagenan. This derivative proved to be particularly effective against pneumococci. Indeed, good results were reported in March of 1938 for the first trials treating pneumonia in French patients. Marketed in France from June 1938, the drug was recommended for the treatment of a rapidly expanding number of conditions (Vidal 1940: 491).[17] From the late 1930s, several more French sulfonamides were commercialised, in both tablet and injectable forms, including Lysococcine (Laboratoires Borne), Néococcyl (Laboratoires du Dr. Pillet)[18] and Novamide (Etablissements Mouneyrat).

By the early 1940s, many of the most dreaded and common diseases of the early twentieth century had been brought within the reach of effective chemotherapy. Although sulfonamides lost their place in the limelight when penicillin was introduced in 1943, they have nonetheless continued to play an important role in the history of therapeutics. Not only was it discovered that they had bacteriostatic

[14] Septoplix seems not to have remained unpopular in France before F. A. Buisson joined the Administration Council of Rhône-Poulenc in early 1937. Buisson was the founder of the firm *Théraplix*, of which Rhône-Poulenc owned 13%; *Théraplix* diffused Rhône-Poulenc products that had been refused by *Specia*, to which they were always offered first (Blondeau 1992: 242–51).

[15] Septoplix was also deemed to be "apparently effective" in treating Malta fever (brucellosis), gas gangrene, infectious complications of influenza, secondary infectious rheumatisms, pneumococcal infections, lung abscesses and trachoma; and finally to be "partially effective" in the treatment of typhus, puerperal fevers, septicaemias, influenza and foot-and-mouth disease. Administered in the form of tablets (in 0.50 g doses), suppositories or injection, as well as a powder or solution (Exoseptoplix), the product was also said to be well tolerated.

[16] This association dates back to World War I. With the approval of the British government, an agreement was signed in which provisions were made for the manufacture and then distribution in London of the Poulenc Arsenobenzol. From 1925, the company was gradually sold to Poulenc (Bovet 1988: 203–4).

[17] The polyvalent antibacterial action of the product was in fact similar to that of previous sulfa drugs according to the Vidal drug manual of 1940. Its use was suggested in particular in cases of gonoccocal urethritis, gonorrhoea in women, influenza-related infections, meningitis, cystitis, keratitis (inflammation of the cornea) or even ear infections. Initially offered in the form of tablets, Dagenan was then also marketed as a solution for injection (Soludagenan). Dagenan and Soludagenan were often used jointly in order to optimise tolerance to the tablet form.

[18] This was also a polyvalent specific for the treatment of infections by streptococci, gonococci, pneumococci, staphylococci, colibacilli, melitococci, haemophilus ducreyi (chancroid), Friedlander's bacillus (pneumonia) and Pfeiffer's bacillus.

properties (i.e. inhibited the growth of bacteria); sulfonamides also paved the way for the discovery of several other therapeutic classes (Lesch 2007: 10–12).

1.2 Sulfonamides in Vietnam; Their Introduction and Popularity

Given the high prevalence of infectious diseases in Vietnam at the time when sulfonamides were introduced (Monnais 1999: 34–56), we would expect a rapid diffusion of the drugs to the colony. Indeed, by early 1936, we find Rubiazol listed in AMI's supplies. However, it was Dagenan, distributed from 1938, that elicited the most experimentation, the liveliest scientific debate and, it seems, the greatest popular enthusiasm.

1.2.1 First Experiments, First Uses

Rubiazol appeared on order lists for the central pharmacies of AMI in 1936[19] and was still supplied to AMI facilities in 1943.[20] Yet, we found no discussion of Rubiazol in official health services reports or the local medical press.[21] Septazine and Soluseptazine were the next sulfonamides to be launched on the market. Both were part of the order list for the health service of Tonkin in 1937;[22] their use in Vietnam was also described in two articles published in 1938 and 1939 in the *Bulletin de la Société de Pathologie Exotique (BSPE)*. We thus know the substances were distributed locally, although perhaps only for experimental use, from 1937. What is striking is that both medicines were used in Vietnam to treat a condition that had not been part of their official therapeutic indications, namely malaria (Vidal 1940: 1680). The first article was written by a malaria specialist, Dr. Farinaud, with Dr. Ragiot, who explained that its strong antibacterial action justified its use in a maximal range of conditions. They reported the intravenous use of Soluseptazine (in a dose of 10 cm^3 per 24 h) over 10 days in three individuals suffering from malaria, whose blood parasite levels were measured regularly. According to them, "Soluseptazine, because of its schizonticide action[23], deserves to take its place in the anti-malarial therapeutic arsenal" (Farinaud and Ragiot 1938: 910). Also co-authored by Farinaud, with Dr. Eliche, the second article reported on tests of both Septazine and Soluseptazine in15 women infected with malaria who had given birth at the indigenous maternity of Saigon-Cholon. Again, the authors suggested that these medicines, due to their marked action on schizonts but also their lack of

[19] CAOM, Gougal SE 2920.

[20] CAOM RST NF 6441, "Fichier 2975, Cession de médicaments pour Dalat, juin 1943".

[21] I determined this on the basis of a systematic review of several medical journals, both colonial (*Annales d'Hygiène et de Médecine Coloniales, Archives de Médecine et de Pharmacie Coloniale, Bulletin de la Société de Pathologie Exotique*) and specifically Indochinese (*Bulletin de la Société Médico-chirurgicale de l'Indochine, Revue Médicale Française d'Extrême-Orient, Archives des Instituts Pasteur d'Indochine*). It must be noted, however, that products manufactured by *Laboratoire Roussel* were nonetheless quite present in Vietnam at this time; many of these were hormone-based or opotherapeutic (substances derived from animal tissues such as organs and hormonal extracts), in which the company specialised during this period (Blondeau 1992: 228–39).

[22] CAOM, Gougal SE 2920; RST NF 3710, "Médicaments nécessaires aux besoins de l'AMI au Tonkin, 1943".

[23] That is, an agent able to kill schizontes, the asexual form in which malaria-causing parasites develop in the liver and the blood.

toxicity, should be considered as adjuvant treatments for malaria, to be used in the initial phase of treatment if quinine alone proved to be insufficient (Farinaud and Eliche 1939: 674–81).

The first articles on Septoplix I found in the colonial medical press were published in 1938 by the *Annales de Médecine et de Pharmacie Coloniale (AMPC)*; these were reprinted from the French *La Presse Médicale* (Martin and Delaunay 1937: 255–57; Ravina 1938: 736–37). Both articles emphasise the efficacy of the drug—in streptococcal meningitis, meningococcal infections, but also against pneumococci, typhus and paratyphus germs, and gonococcal infections—and its superiority over its predecessors. On its toxicity, however, the articles disagreed. While the first remarked on its low toxicity—the therapeutic dose was estimated to be 20 to 50 times lower than its toxic dose, making it safe for use in children—the second warned of potentially serious side effects (collapsed organs, fever, tachycardia, anaemia, jaundice) that would require an interruption of treatment as well as blood transfusions. In 1939, three articles on Septoplix were published by doctors working in Vietnam.[24] In the first one, Charles Massias and Nguyen Dinh Hao (1939: 581–85) reported rapid and successful results in the treatment of gonococcal joint infections. Massias again, with Dr. Pham Huy Quat and the nurse Tran Van Bang, describe the successful use of Steptoplix in curing a case of acute streptococcus meningitis in late 1939 (Massias et al. 1939: 907–08).

A third report, by Drs. Jean Grenierboley and Nguyen Huu Phiem (1939: 603–14), specialists in venereal diseases practising at the Lucas-Championnière Clinic of Hanoi, described comparative trials of Septoplix, Néococcyl[25] and Dagenan. The doctors considered the results obtained to be unreliable because "patients of the clinic are too whimsical, too irregular," as well as too ill, making it impossible for them to contribute to international debates. They nevertheless provided a detailed description of their protocol and formulated three conclusions: sulfonamides had an "effective and sometimes very rapid" action on gonococcal infections and were thus valuable; this efficacy seemed to be greater in men than women; some patients, however, should not be treated with sulfonamides, including those suffering from other conditions (such as syphilis and tuberculosis), who manifested signs of intolerance, or were infected by drug-resistant gonococci.

Dagenan was clearly the most widely discussed sulfonamide in the Indochinese medical press, and the least contested. By early 1938, it had already been tested in French patients and by April of that year, the *British Medical Journal* declared Sulfapyridine to be the most effective—even specific—treatment for gonorrhoea.[26] In the Indochinese medical press, no fewer than eight articles, written by a dozen doctors, both French and Vietnamese, were published in 1939 describing trials begun since 1938 on Vietnamese territory. Such a quick and prolific professional response to Dagenan in Vietnam is not surprising; it was part of an immediate and widespread enthusiasm for the drug among the international medical community—

[24] The 1939 volume of the *Revue Médicale Française d'Extrême-Orient* in which these articles are published is almost entirely dedicated to sulfonamides.

[25] The central supply pharmacy of Tonkin began to stock up on Neococcyl from 1938 (CAOM, Gougal SE 2919, "Services sanitaires, Inspection générale de l'hygiène et de la santé publique, Correspondances diverses, 1938–43") but the product was only cited in the medical press in the report on this experiment.

[26] "Chemotherapy in gonorrhoea (editorial)", *British Medical Journal,* August 6, 1938.

and soon also among consumers of medicines in Western countries (Lesch 2007: 184–203). Still, the rapidity of its diffusion to Vietnam does seem striking.

Apart from two articles by a colonial pharmacist describing chemical analyses of the substance (Cousin 1939: 142–45; Cousin and Nguyen Van Dinh 1939: 710–14), all of these articles, written by medical doctors, concluded that the drug was more effective, and especially more rapidly acting, than its competitors in the treatment of gonococcal urethritis, cerebrospinal meningitis and, of course, gonorrhoea (Massias et al. 1939; Massias and Nguyen Dinh Hao; Seyberlich and Le Thi Van 1939). Dr. Nguyen Van Tung, physician in chief of the Prophylactic Institute of Saigon, which specialised in the treatment of venereal disease, was particularly enthusiastic:

> "(…)The discovery of compound '693' marks a new phase that may be decisive in the chemotherapy of gonococcal infections (…). By its truly extraordinary curative action, it proves itself to be clearly superior to other compounds of the sulfoconjugated series. While remaining cautious not to rush into a premature declaration of enthusiasm (…) this product can be considered to be the specific treatment, *par excellence*, of gonorrhoea (…) Also, with Dagenan, it is possible to speak of a specific chemotherapy because, used alone (…) it has resulted in a percentage of cures above 90% and this in a very short time (…)" (Nguyen Van Tung 1939: 660)

Dagenan seems thus to have rapidly become adopted as the specific treatment for gonorrhoea by doctors practising in Vietnam.[27] Unsurprisingly, a few problems were noted: Drs. Grenierboley and Nguyen warned, as we've seen, that it was more effective in men than women, and that side effects were associated with its use. Still, Grenierboley largely agreed with Tung that Dagenan had so far been found to be more effective, and easier to manipulate, than other sulfa drugs. Thus, he called for the colonial administration to distribute Dagenan to all medical facilities, both civil and military. In the same vein, Dr. Riou (1939: 822–23) also pointed to its differential efficacy, but this only made Dagenan more valuable in the colonial context; indeed, he found the drug to be more effective in Vietnamese than European patients; moreover, the former seemed to better tolerate the drug and experience fewer side effects.[28]

Despite this alacrity in setting up trials of Dagenan and their very definite conclusions on the value and particularly the toxicity/efficacy ratio of the drug, it seems that, as late as 1940, sulfonamides were still unavailable in the majority of AMI's hospitals. Nor do they appear in the annual reports of the healthcare services. We know these products were expensive. Given AMI's extremely limited budget for

[27] At this time, in North America as well as in European countries such as France and Great Britain, Dagenan was mainly acclaimed as an effective and specific cure for pneumonia (Lesch 2007: 172–83).

[28] This idea, according to which Dagenan might be more effective in colonised populations, raises several interesting points: it indicates that the substance, and probably other sulfa drugs as well, were experimented simultaneously on European and indigenous patients, apparently in similar conditions (although we do not have any reliable information on the way in which sulfa drugs were consumed in colonial society beyond these trials); it also brings up the notion of a specific 'Indochinese constitution,' which would seem to question the extent to which therapeutic paradigms had already shifted at the time towards the specificity of the treatment—rather than of the patient. To explore this further, it would be interesting to compare the use and perception of sulfamides in other French colonies and Asian countries at this time.

medicines,[29] we can hypothesise that their distribution was limited to large hospitals and specialised clinical services, for the most serious cases, or perhaps for paying patients.[30] Sulfa drugs must also have been available in private pharmacies: but here, not only did their cost have to be entirely assumed by buyers, but their purchase also legally required a prescription (and therefore a medical consultation), as well as access to a pharmacy that had these medicines in stock...[31] Still, there is evidence that some sulfonamides, especially Dagenan, elicited great popular enthusiasm, at least in urban settings, within the span of just a few years. How can we explain this? What happened in the short transition from highly targeted experimentation to this widespread popular acclaim? By what means did the Vietnamese become familiar with these products; how did they come to know enough about the efficacy and uses of sulfonamides to make specific demands for these drugs?

1.2.2 Immediately, but Illegally, Popular

Turning away from medical discourses to look at a broad range of legal, administrative, and popular sources, we see that as sulfonamides were undergoing early tests and parsimoniously distributed to the largest hospitals, they had already began to elicit a positive popular response. This is revealed in particular by evidence of their illegal distribution. With the onset of World War II, violations of laws on the sale of toxic substances became increasingly visible.

Unlike healthcare service reports, which offered no comment on the consumption or reception of Dagenan and other sulfonamides in Vietnam,[32] the medical press does offer occasional glimpses of patients' reactions. For example, the 1939 volume of the *Revue Médicale Française d'Extrême-Orient* (RMFEO) noted that patients were fully satisfied with the results of their experimental treatment for gonorrhoea, as well as meningitis and serious forms of pneumonia, and thus developed a trust in sulfonamides, particularly Dagenan. A more striking and persuasive indicator of Dagenan's popularity, however, is the extensive illegal trade of the drug that seems to have emerged almost as soon as the drug was introduced in Vietnam. Evidence for this commerce can be found in various administrative inquiries, reports of the Inspection of pharmacies (from 1908), individual complaints of theft, prosecutions for trafficking, falsified prescriptions and counterfeit products. The volume of these complaints, denunciations and seizures would increase during the war, particularly from 1940. It must be pointed out that the wartime context made this black market increasingly conspicuous in two ways. While shortages of medicines, both predicted

[29] A tube of 20 tablets of Dagenan, in doses of 0.5 g (the equivalent of a maximum of 5 days to a week of treatment) cost 25 francs (fr) in the Metropole in 1940. When export and distribution costs are added, the price of a tube for the AMI could easily reach 35 to 40 fr. In the 1930s, the annual budget for medicines of an average AMI structure was 500 to 800 piastres (5,000–8,000 fr).

[30] Although medicines were, for the most part, distributed free of cost to those having access to public healthcare within the framework of the AMI, this gratuity imposed certain choices on doctors who, having limited supplies, had to be selective in stocking and distributing products to non-paying patients.

[31] In his report to the Local Director of Health of Tonkin in 1931, the Inspector of Pharmacies Antonini estimated that only 15,000–20,000 (out of 9 million) could afford to buy French medicines (CAOM RST NF 4683).

[32] I must, however, point out that the colonial archives contain a more exhaustive series of health reports for the period before 1930; the information I have for post-1930 is thus less complete.

and actualised, stimulated the *actual* expansion of illegal trading, there was also an increased vigilance in the surveillance of circuits of distribution/importation (for drugs as well as other products) that made authorities more aware of such activities.

By 1940, a single dose of Dagenan was sold for up to 30 piastres on the black market; that is, the equivalent of 2 months' salary for a low-ranked employee in a local firm, or a third of the salary of a secretary in the Saigon city hall (Brocheux and Hémery 1994: 203/209). While only a minority could afford to buy on the black market, it was also possible to bend the rules in order to purchase the substance more cheaply in legal pharmacies. For example, the newspaper of the settler community, *La Dépêche d'Indochine,* reported the following case in July of 1942:

> "Native tribunal—the Boy-Doctor"
>
> To do a favour for his friend Dang-Van Ly who was ill, the boy of Docteur D… named Vo Van Tam took a sheet of paper with his boss' heading and wrote out a prescription for a tube of Dagenan. The "patient" then entrusted the false prescription to another friend, Nguyen Van Viet, to buy the medicine. The pharmacy detected the counterfeit, phoned the doctor and the subterfuge was discovered.
>
> "Prosecuted in the correctional tribunal, the boy and the ill man were each condemned to a 4 month suspended sentence while Nguyên Van Viêt was acquitted, as he acted in good faith and did not know that the prescription was false"[33]

Over the next few months, similar news items appeared in the *Dépêche* as well as other newspapers with a largely Vietnamese readership such as *L'Echo Annamite* and *La Tribune Indochinoise.* According to such texts, most cases of this type involved an accomplice who had relatively easy access to public (AMI) or private stocks of sulfonamides. This seems to be confirmed by health authorities. In August 1942, the local director of health in Tonkin reminded the president of the local Chamber of Agriculture—who had requested an emergency expedition of Antipyrin—that from then on all demands of this type would have to be more tightly controlled to limit the risk of resale by subaltern agents "as had happened on a large scale with Dagenan."[34] The involvement of a broad variety of intermediaries in this parallel market—including AMI employees and individuals outside the health system, both French and Vietnamese, and even foreign—made it all the more difficult for colonial health authorities to control. For instance, we know that, in the 1940s, foreign pharmaceutical companies including Asian ones—especially Japanese due to Indochina's inclusion in the Greater East Asia Co-Prosperity Sphere—offered to supply Western-style Vietnamese pharmacies, but also traditional drug shops, with Sulfapyridine under different commercial names.[35]

The following excerpt is particularly revealing of what seems to have been the most common means of obtaining Dagenan at the time:

> "Sender: Ngo, Nam Dinh Residence"
> Recipent: Nguyen Dang, Lieutenant, Grall

[33] "Le boy docteur", *La Dépêche d'Indochine*, 2 juillet 1942.
[34] CAOM, RST NF 6264, "Demande d'antipyrine de la Chambre d'agriculture, 1942".
[35] CAOM Gougal SE 213, "Réglementation de l'exercice de la pharmacopée traditionnelle sino-indochinoise, 1942–43, Dossier autour de la demande de la maison Dainan Koosi".

> My wife had a miscarriage. Cu Doc came to treat her and found that the egg was destroyed. She is now in poor health. To relieve her, she must be given laminar inserts [*to dilate the cervix*] (…) Each laminar insert cost only 1$00 before, but I am forced to pay 20$00 now for an injection for my wife because this product cannot be found in any pharmacy in Nam Dinh, Thai Binh and Saigon. My wife also has to take Dagenan pills, but the stock of this medicine has completely run out here, and I have to give her Steptoplix instead (…) As for the *tontine [communal savings*], if you are not in need of money, you must not buy now because merchants are buying with an interest of 2% to do their business for the Têt which is approaching. I've already received the Solucalcium you sent me and I am sincerely grateful (…)."[36]

This document, intercepted in December 1942 by the agency controlling communications in Saigon was part of a personal correspondence involving two individuals, both Vietnamese, who seemed to know each other quite well; the agreement between them was clearly not new.[37] Both were closely linked to the colonial administration—the first as an employee of the administration in Nam Dinh, the other occupying a post at the Grall military hospital in Saigon. Yet, they were not part of a local network of distribution of medicines since the receiver was located in a provincial capital on the coast about 90 km from Hanoi, while the supplier was in Saigon, at the other end of the country. It must be noted that Ngo seemed to be quite familiar with the medicines he was ordering from Dang for his sick wife; he knew their commercial names and their therapeutic indications. He even established a hierarchy between the two sulfonamides that had only recently been introduced into Vietnam, and which, although attributed similar therapeutic indications, already had a reputation for different degrees of efficacy, at least among health professionals who had concluded this on the basis of experimental results.

1.3 Preconditions for a Precocious Pharmaceuticalisation?

The early enthusiasm for sulfonamides indicated by this type of correspondence calls for a reflection on its potential determinants. I would like to suggest several lines of analysis here. First, I examine the strategies of the Western pharmaceutical industry and the configuration of networks of pharmaceutical distribution that are likely to have had an impact on the Vietnamese market for medicines before 1945. I then suggest that previous experience with effective medicines for serious infectious diseases may have facilitated and accelerated a favourable evaluation of sulfonamides by the Vietnamese population; in other words, I hypothesise that sulfonamides became part of a broader process of gradual familiarisation with modern medicines that had begun before their introduction in the late 1930s. Finally, I will turn to the gap between the supply of, and the demand for sulfa drugs; and reflect on the ways in which this discrepancy may have shaped the reconfiguration of health referents (representations and practises) in Vietnam during this period.

[36] CAOM RST NF 3710, "Fiche de renseignements des commissions 'C' et 'K' de contrôle postal et de contrôle télégraphique et téléphonique de Saigon issue d'une interception postale".

[37] Their relationship seems to involve various types of links. This is suggested by the mention of the tontine, an old Vietnamese practise of collective savings to which several members of a same village contributed.

1.3.1 The Pharmaceutical Industry and its Networks in Colonial Vietnam

What do we know about the presence of the Western pharmaceutical industry in Vietnam before the end of World War II? By collecting a database of information on all documented pharmaceuticals found in Vietnam before 1940, I have been able to identify at least 200 different drug firms exporting there. Most of these were European (mainly French), but some were also North American and Asian.[38] A few firms accounted for a greater number of products than others[39] but one clearly stands out: Rhône-Poulenc. Rhône-Poulenc and its commercial subsidiaries (Specia, *Société d'expansion chimique*, et Théraplix, *Société générale d'applications thérapeutiques*), distributed at least 45 different pharmaceuticals in Vietnam during from the 1920s to the 1940s, mainly sulfonamides, synthetic anti-malarials and, before them, arsenical compounds including arsenobenzols.

Founded in 1895, Rhône-Poulenc was present in Vietnam as early as the turn of the 1910s, at the time when Fourneau's laboratory at the Institut Pasteur was just starting up and compound 606 undergoing tests in different clinical contexts and countries. Indeed, the firm was among the first companies to manufacture 606 under different commercial names, including Arsénobenzol Billon (named after another of the firm's close collaborators, Francis Billon), used for the first time in Vietnam during an epidemic of recurrent fever in Tonkin in 1912.[40] Although the history of the relationship between Rhône-Poulenc and the Institut Pasteur is now fairly well-known, (Bovet 1988; Quirke 2007: 53–95)[41] what do we know of its influence in French colonies? Although it has not yet been possible to access the firm's colonial archives,[42] it has nevertheless been possible to discern a strong relationship between Rhône-Poulenc and Indochina, a relationship that was undoubtedly established and maintained thanks to the Indochinese network of Pastorian laboratories. With four Vietnamese Institut Pasteur by the late 1930s (Saigon, Nha Trang, Hanoi, Dalat), in addition to three affiliated laboratories, it does indeed seem likely that the diffusion of the therapeutic discoveries made in Fourneau's laboratory, which were both financed and eventually commercialised by Rhône-Poulenc, was facilitated by this local Pastorian network.

[38] In 1914, the *Dictionnaire des spécialités* Vidal, an index of medical and commercial specialties sold in France, announced products manufactured by 131 laboratories; by 1933, there were 689 (Blondeau 1992: 21–33). It must be added that we were unable to determine the origins of about a hundred specialties. While it seems likely that some of them were produced by a local industry (French or Vietnamese) others were more probably manufactured by small, marginal or ephemeral metropolitan laboratories.

[39] In particular, the French laboratories *Robin*, *Hoffman Laroche et Cie*, *Roussel*, *J. Logeais*, *Clin, Comar & Cie*, *Byla*, *A. Lumière* and *Bailly.*

[40] CAOM RST NF 4018, "Rapport sanitaire annuel de la province de Kien An, 1913".

[41] Although the relationship between Rhône-Poulenc and the Pasteur Institute was not always an easy one, in particular due to the tensions between the pharmaceutical firm's search for curative medicines and the Pastorian ideal (in which the priority is given to preventive health interventions such as vaccination), this collaboration has been pointed to as evidence of the development of an alliance between science and industry in France from as early as before World War II, as Viviane Quirke has shown. This collaboration is also indicative of French specificities in the relationship between the pharmaceutical industry and scientific research, which is characterised by a particular combination of informality and centralisation (Quirke 2007: 95–96).

[42] For those which may still exist, as Rhône Poulenc's archives for Indochina have apparently disappeared. The documents of the *Laboratoire de chimie thérapeutique*, held at the archives of the *Institut Pasteur* in Paris are, unfortunately, not very informative on the subject.

We can find various manifestations of Rhône-Poulenc's involvement in Vietnam from the 1920s. Most obviously, the firm supplied both private pharmacies and the public system, the AMI, with chemical substances and pharmaceutical products;[43] and it was often given preference—fairly or unfairly—over other laboratories in bids for the supply of identical products to the colony.[44] A more subtle complicity can also be discerned between colonial authorities, Rhône-Poulenc and AMI physicians in making arrangements for experiments of the firm's most recent products in public health facilities. This type of arrangement seems to have become increasingly common from the 1930s.

In an article published in 1935 in the *AMPC* reporting on the experimentation of a combination of Plasmochine and Atebrine (synthetic anti-malarials), Dr. Martial thanked Poulenc for having "kindly put at his disposal samples of the product, thus allowing him to pursue his trials at the indigenous hospital" (Martial 1935: 310). In 1936, Dr. Montel also explicitly acknowledged Rhône-Poulenc's contribution to his search for an adjuvant in the treatment of leprosy: "(…) We are grateful to the *Société parisienne d'Expansion Chimique* [*Specia*] for their willingness to provide us with complimentary samples of Cysteine, which we used (…)" (Montel et al. 1936: 1063). The strategy of distributing samples free of cost to several hospitals was also used by Theraplix to promote the experimentation of Dycholium, an antiseptic and diuretic launched in 1938.[45]

Administrative correspondence suggests that the Government General's frequently mentioned confidence in Poulenc products was reinforced by study tours financed by the firm (for instance, the Decourt mission enabled trials of malaria chemotherapy).[46] There was also an ongoing correspondence between the administration and the firm, in which the latter highlighted the value of its products as well as its constant efforts to foster progress in the field of tropical medicine. Specia was represented by an office in Saigon from 1936, established at 122-24 rue Catinat, in the economic heart of the city but also close to its principal pharmacies.[47] In 1939, this office began to expand to include the other subsidiaries of the group; at that time it was directed by Henri Rochard, a French pharmacist whose mission was to promote the laboratory, but primarily to supply Indochina's pharmacists and doctors, in both the AMI and the private sector.[48] This relationship was maintained during World War II when the Saigon office helped bridge gaps in the supply of medicines deemed to be essential,[49] and to set up trials of penicillin and other early antibiotics, as well as the anti-malarial Nivaquine (Canet 1948: 527).

[43] Fourneau's laboratory also produced chaulmoogra oils for leprosy treatment in the 1920s.

[44] By the 1930s Rhône-Poulenc would complain several times about the competition and of the fact that the AMI "no longer trusted it" as much as before (CAOM, Gougal SE 2921, "Services sanitaires et assistance publique. Achat de médicaments et de matériel pour les services sanitaires de la Cochinchine et du Cambodge, 1936").

[45] CAOM Gougal SE 2919.

[46] ANVN, Hanoi, RST 48024, "Service de santé, divers, 1927–36".

[47] CAOM Gougal, SE 2919/2921.

[48] CAOM, Gougal SE 217, "Produits toxiques, Autorisation personnelle et permanente d'importer en Indochine des substances toxiques du tableau B, 1937–40".

[49] CAOM RST NF 3710, "Note du contre-amiral secrétaire d'Etat aux Colonies (pour le ministre, le directeur du service de santé, le Dr Blanchard) au Gouverneur général de l'Indochine, Paris, 30.10.1940".

Although the links between the local administration and Rhône-Poulenc (and its subsidiaries) are particularly striking, other actors participated in creating links between the pharmaceutical industry and the colonial government. In addition to the Government General in Indochina, the Ministry of Colonies in Paris also played an important role in promoting the experimentation of certain pharmaceuticals in Vietnam, and indeed in other colonies. For example, it was by decision of this Ministry, on the advice of the Metropolitan Superior Council of Health, that Stovarsol (Rhône-Poulenc), which proved to be a safe and effective specific treatment for amoebic dysentery, was introduced to Vietnam in 1924.[50] Again, it was in response to the Ministry's request that the Government General distributed new products, including several manufactured by *Laboratoire Bailly*, to the supply pharmacies of Saigon, Tourane and Hanoi to be experimented in public health facilities. This was also the case for Quinimax (1936), manufactured by the laboratory of the same name, as well as the sulfonamide Neococcyl produced by *Pharmacien Houet* (1938).[51] The introduction of Dagenan proceeded in a similar way in the summer of 1938. Although the manufacturer already had a local office, the expedition of stocks to the supply pharmacies of Saigon, and then Tonkin, was decided between the Ministry of Colonies and the Governor General.[52]

Such links between the colonial (metropolitan and local) administrations, the pharmaceutical industry, and public hospitals had, in fact, existed since the late nineteenth century.[53] They eased and accelerated the overseas testing of various new Western compounds; this experimentation would inevitably orient the therapeutic uses of certain substances according to colonial—scientific, but also commercial—priorities. Such practises evoke a conception of Indochina as an "open field of experimentation" and raise questions about the professional uses of pharmaceuticals within the colonial health system. Substances that had not yet been proven effective, and were potentially dangerous, were used in a trial-and-error fashion that would inevitably "have an effect" on "guinea pig" patients.[54] Several doctors even specified in their reports to the AMI administration that complimentary supplies provided by manufacturers enabled them to use a product in their service for the first time. Given the limitations of AMI's budgets for medicines, such practises raise important ethical issues. At the same time, there is also evidence that, thanks to the findings of AMI-employed doctors, several medicines were never widely distributed in the public system: because they were found to be ineffective or toxic, or because similar—more familiar, safer, or less expensive—products already existed in the colony.[55] We might also suppose that these initial, free sources of supply broadened the access of

[50] CAOM, RSA (Fonds de la Résidence supérieure d'Annam) S1, "Emploi aux colonies du produit médicamenteux 'Stovarsol', 1924".
[51] CAOM Gougal SE 2919.
[52] CAOM, Gougal SE 2920.
[53] CAOM, Indo AF (Indochine Ancien Fonds) carton 324 Y 04 (5), "Expérimentation de pansements, médicaments, produits pharmaceutiques, produits alimentaires, matériel d'ambulance dans les hôpitaux et les troupes d'Indochine, 1889–1902".
[54] It must be noted that in trials of at least some products the subjects were both French (often military) and Vietnamese.
[55] This was the case, for example, of Eparséno (*Laboratoire Pomaret*) in 1924, which was meant for the treatment of leprosy, but which was shown, by trials in various colonies (including Indochina), to be ineffective and difficult to handle (Legendre 1925: 350).

Vietnamese patients to the benefits of certain products, allowing for experiences of relief or cure that may have promoted a greater popular acceptance of some pharmaceuticals, as we will see. In addition, by fuelling competition between pharmaceutical laboratories,[56] such practises might even have provided a boost to therapeutic research in tropical medicine.

Yet, such competition may also have led to abusive practises. For example, there is evidence that some French pharmaceutical companies provided toxic drugs, directly or through intermediaries, to unqualified distributors. A circular letter from the Governor of Cochinchina dated 1921 is revealing:

> The local director of health brought to my attention, several times, the fact that numerous natives, especially nurses, practise medicine illegally and do not hesitate to use drugs that are most difficult to handle, such as intravenous injections of arsenical salts (…) Not only are they committing a crime, they also, in addition, pose a threat to public health. These empiricals frequently receive these products by shipments and postal packages from Saigon or even from France (…)[57]

A letter from a certain Thanh Van, published a few days after this circular in the same journal, reveals the involvement of several Western-trained pharmacists established in the colony as intermediaries in this illicit commerce.[58] Indeed, from the 1910s several French pharmacists in Hanoi and Saigon had already been reprimanded by the Inspection of pharmacies for distributing narcotics (morphine, cocaine) without prescriptions and in large quantities to physicians as well as non-physicians, both French and Asian. Then, in 1943, a confidential note from the Local director of health in Cochinchina to the Director of Specia's Saigon office reported: "(…) As it happens, Soludagenan is now impossible to find in Tonkin, unless you go on the black market. I am in the process of getting M. the Inspector of pharmacies to verify (…) the legality of exits of Soludagenan in civil pharmacies (…) having every reason to believe that this medicine is mostly directed towards unauthorised recipients (…)."[59]

Most of the intermediaries in this trade gravitated around the local medical world, both in the AMI and outside it. Apart from pharmacists, nurses and other hospital staff members, but also Asian drug vendors or therapists, were among those who were the most likely to have access to medicines that were in high demand. Indeed, in the 1920s, there was a veritable media attack on AMI nurses in which they were accused—more than other intermediaries—of covertly reselling toxic medicines obtained from public stocks, as well as administering injections of anti-syphilitic medications without permission. These various accusations thus give us a sense of the diversity and changing configuration of protagonists that were implicated in the diffusion of medicines during this period. They also draw our attention to the fact that consumers, though viewed by doctors and colonial authorities as potential victims, were actively seeking out these medicines.

[56] A competition that was made evident in Vietnam by the system of adjudication developed to supply the colony with medicines, in which preference was given to French suppliers (CAOM Gougal SE 2921).
[57] *L'Echo Annamite,* n 215/217, 21/26 juillet 1921.
[58] *L'Echo Annamite*, n 220, 2 août 1921.
[59] CAOM RST NF 3710.

1.3.2 A Gradual Familiarisation with "Colonial Medicines"

The surprisingly rapid Vietnamese acceptance of sulfonamides in the early 1940s may also been facilitated by prior experiences of pharmaceutical efficacy. Arsenobenzols, introduced in the 1910s and generally considered to the first effective anti-infectious drugs, appear to have familiarised the Vietnamese with powerful (effective but also toxic) and targeted therapeutic effects. This familiarisation operated through the accumulation of personal and collective experiences of efficacy, through direct observation of individual cures and accounts of therapeutic success circulated by word of mouth.

Compound 606, distributed under different commercial names, was probably the first colonial medicine to demonstrate its specific action in Vietnam. From as early as 1911—thus, once again, very soon after its launch onto the European market—Salvarsan was used in the colony to treat syphilis. Along with other new arsenical derivatives, the drug would occupy a prominent place in reports of local therapeutic experiments throughout the colonial period. The content of this experimentation was very similar to what I have described for sulfonamides. Most trials were similarly structured, with a focus on the evaluation of toxicity/efficacy ratios. Interestingly, we also see a growing emphasis on local specificity (pathological, constitutional), that is, on evaluating the drugs for locally useful therapeutic indications and on adapting dosages and treatment regimens to Vietnamese patients, according to their sex, age, general state, etc.[60]

It must be noted that the uses of arsenical drugs, and particularly Salvarsan and then Neosalvarsan, would be broadened to treat diseases other than syphilis (including amoebic dysentery, recurrent fever, yaws and others) thereby not only reducing the burden of pathologies that were highly prevalent in Vietnam, but also helping to transform local conceptions of (in)curability. The case of syphilis, however, remains perhaps the most striking. In 1930, it was still the second highest cause of morbidity in hospitals, just after malaria; in 1936, it accounted for 11,031 hospitalisations in AMI facilities. The disease was well-known to the Vietnamese, who sought to cure it by any means,[61] yet remained sceptical of controlling prophylactic measures (Monnais 1999: 189–91). Through their use of Sino-Vietnamese medicine, the Vietnamese were familiar with a range of therapeutic options for syphilis, including many toxic mercury-based remedies; still, arsenobenzols seem to have been perceived as a novel type of response. Its curative action was particularly significant given syphilis' effects on fertility (beyond being fatal) in a society in which children were valued above all else (Hermant 1931: 109).

From 1912, only a year after the first local experiments, Salvarsan was already being requested by syphilis sufferers at the protectorate hospital of Hanoi, as Drs.

[60] Of course, there were also incidents, intoxications and deaths. Nor am I suggesting that these medicines were welcomed by all, or immediately… or denying that some experiments were oriented towards basic scientific goals (to establish thresholds of toxicity, for example) rather than therapeutic evaluation, as was the case with arsenobenzols in other colonies (Eckart 2002: 69–89).

[61] We see, for example, in *l'Echo Annamite* for 28–29 September, 1924 that the pharmacist Louis Sarreau of Saigon was the victim of an important robbery committed by two of his coolies: vials of potassium iodine totalling a value of 3,000 fr were reported to have been stolen. At this time, potassium iodine was one of the substances used to treat syphilis.

Roux and Tardieu complained: "patients have a clear tendency of requesting this medicine instead of mercury, which we are firmly refusing to do when the medicine does not appear to be useful to us" (Roux and Tardieu 1912: 533). In 1913, Dr. Paucot, a doctor working in Tonkin who was contributing to a debate on the use of Salvarsan in the colonies declared: "the natives had so much appreciated the rapid action of 606 that an *Annamite* counsellor of Nam Dinh has expressed the wish, in a provincial assembly, for a ton of 606 to be sent there (…)" (Paucot 1913: 240). Clearly, the bodily experience of its rapidity of action, more so than its therapeutic efficacy per se, was regarded as highly significant. Also in 1913, Dr. Mouzels noted in particular the visibility of salvarsan's effect—which was perceived collectively—in the treatment of recurrent fever: "(…) we have seen, during a recent trip (…) our friend Dr. Hermant using 606 injections during an epidemic in the village. That patients came on their own to the doctor to claim the inoculation: this shows both the seriousness of the condition and the value of the treatment (…)" (Mouzels 1913: 281). A medicine with such rapid and spectacular effects could—like a surgical procedure, the treatment of an elephantiasis case or the successful reduction of a fracture—play a decisive role in giving a positive reputation to a particular doctor and, more broadly, to Western medicine. In addition, arsenical drugs were, unlike sulfonamides, theoretically available in all AMI facilities staffed by a doctor from 1915.[62]

Other colonial medicines, not just those identified as 'revolutionary,' seem to have been appreciated for their rapid, visible effects on the course of diseases or the relief of symptoms. Several medical reports for the 1910s, for example, identify the rapid expulsion of worms provoked by the anthelminthic drug Santonin as the principal reason for its popularity.[63] While the experience and appreciation of effect and efficacy was not limited to Salvarsan, this and other arsenical drugs played a key role in the development of popular enthusiasm for colonial anti-infectious medicines in general and, in particular for sulfa drugs, especially given that they were generally injected,[64] a mode of administration that was unfamiliar to the local population.[65] Modern forms of pharmaceutical conditioning, such as pills and tablets, seem to have been received enthusiastically in Vietnam. It is not hard to see why, as they facilitated transportation, distribution and consumption and also helped maintain the quality of substances—an important attribute in tropical climates. Injections (intravenous, intramuscular, intrarachidian…these are the most commonly reported forms in Vietnam), however, seemed initially to fall outside this growing appreciation for novel modes of administration.

[62] CAOM, Gougal 16338, "Nomenclature réglementaire des médicaments et objets de pansement devant servir à l'établissement des demandes trimestrielles pour les formations sanitaires de l'Assistance, 1915".
[63] CAOM RST NF 4003, "Rapport sanitaire annuel de la province de Hai Duong, 1915"; RST NF 4007, "Rapport sanitaire annuel de la province de Ninh Binh, 1917". The opposite was also true, and doctors often remarked that the fate of drugs within certain communities could be compromised by an effect that was not sufficiently rapid or perceptible.
[64] Indeed, this seems to be the mode by which arsenical derivatives and sulfa drugs were most often administered; a number of other effective drug treatments were also injected such as emetin hydrochloride for the treatment of dysentery and novocaine in trachoma.
[65] The first syringe was invented by Pravaz in 1841 followed, around 1850, by the use of glass syringes and hollow needles. It was only in 1908 that the injection as a mode of administration was included in the French pharmacists' codex.

Indeed, this technique, because seen as overly intrusive and identified with compulsory anti-smallpox vaccination, was, for a long time, mistrusted and contested (in part as a feature of colonial rule). It was also accused of causing serious iatrogenic effects, including, somewhat ironically, the transmission of syphilis. Its safe and reliable use also required techniques and forms of expertise that were still being developed in the West in the 1910s (Ross and Tomkins 1997: 405–6). In addition, by law, at that time in Vietnam, injections had to be prepared by pharmacists and administered by physicians; this limited recourse to the technique.[66] Although patients may have initially viewed the technique as foreign, difficult to handle and to access, I suggest that they were nevertheless responsive to the accumulation, over time, of favourable experiences and information. As injected treatments were associated—through bodily experience, observation, hearsay or formal learning—with rapid effects of relief or cure, especially in previously incurable conditions, the negative features of injections, such as painfulness (whether due to the substance injected or the mode of injection in itself[67] or simply the fearfulness of needles) would gradually have been pushed aside. Indeed, among both patients and doctors, the principal benefits of injections were identified as increasing rapidity of action and reducing risks and side effects such as gastric intolerance and toxic reactions.[68]

I would thus suggest the hypothesis of a "learning process," which took place first through bodily experience, and then became embodied (Latour 2004: 205–9). While the toxicity of a substance was not, in itself, necessarily perceived as problematic by Vietnamese consumers, colonial doctors pointed to the unpleasant experience of side effects as one of the main reasons why their patients refused or abandoned treatment.[69] That anti-infectious agents (which were, for the most part, injected as well as potentially toxic) were widely accepted by the Vietnamese seems to indicate that they gradually reordered their priorities and concerns (foreignness of procedure, relief, cure, risk, toxicity, pain) in accordance with the results they grew to expect. In

[66] In the framework of the AMI, nurses do not seem to have been authorised to use injections without the supervision of a doctor, or if a doctor had not formally assigned them this task; unless they worked in an outpost where there was no doctor. They were, however, taught injection techniques in local professional training schools.

[67] The discourse on the painfulness of injections during this period was complex, depending on the evolution of techniques, the type of injection, as well as the nature of the product that was injected. For example, in the 1910s, several doctors acknowledged that intramuscular injections used to treat syphilis were quite painful.

[68] In 1917, Vietnamese doctors working in Tonkin reported: "(…) our compatriots greatly appreciate the efficacy of quinine in (…) *[the treatment of malaria]*. Many even request injections, which they praise enthusiastically on account of their rapid and certain effect, despite the pain they cause (…)" (CAOM RST NF 4007). In the 1930s, Quinobleu (containing quinine and Arrhenal, offered in intravenous injections to treat malarial fever) was said to be appreciated by the patients of Faifoo hospital (Annam) in the 1930s "due to a certain euphoria felt from the beginning of treatment" (Chabaud 1938: 820).

[69] Although Western medicines were indeed often accused of being toxic (by both colonial or colonised commentators), overly strong, and not adapted to "Vietnamese constitutions," Chinese medicines were similarly criticised, even while they were consumed by a significant portion of the population and were thus highly profitable as a trade commodity. However, it seems that the fact of experiencing marked side effects may have hampered the acceptance of certain treatments: injections of chaulmoogra oil given to leprosy sufferers in the 1910s–1920s, which were extremely unpleasant (causing pain, fever and nausea), for example, were cited as the most frequent motive for escaping leprosaria. Besides the fact that chaulmoogra had never cured anyone of leprosy…

a more general way, Salvarsan, Neosalvarsan and then Dagenan/Soludagenan or even Stovarsol,[70] seem to have produced an accumulation of evidence of favourable efficacy/toxicity ratios for science-based pharmaceuticals, particularly those which specifically targeted serious diseases. Indeed, this is exactly what Dr. Seyberlich suggested in the RMFEO in late 1939: "it seems to me that when sulfonamides were introduced in the late 1930s, particularly Dagenan, local populations were ready to accept them; already sensitised to a form of treatment, a certain therapeutic process, a certain efficacy that is precisely what is heightened in the case of these products (…)" (Seyberlich and Le Thi Van 1939: 909).

Because they were classified as toxic, however, the distribution of products such as Salvarsan, Stovarsol and Dagenan was submitted to strict rules; their administration required medical surveillance in clinical settings, a physical examination, a prescription, etc. This calls for a reflection on the process of familiarisation not only with the medicines themselves, but also with the clinical rituals associated with their distribution and consumption. However, we also have abundant evidence that vials and syringes were obtained outside the official healthcare system, and thus outside the framework of colonial rules governing the distribution of medicines.[71]

1.3.3 The Gap Between the Colonial Offer and the Colonised Demand

The 'learning process' associated with colonial medicine was also an intellectual one, which operated through a diffusion of formal knowledge about the efficacy of medicines (and, more broadly, about scientific medicine and its models of disease). The popular press seems to have played a particularly important role in this. Indeed, the volume and diversity of journalistic production in Interwar Vietnam was exceptional, and a significant portion of it, in French but also, especially, in Vietnamese, addressed health issues.[72]

In the serials I have consulted, pharmaceuticals such as arsenobenzols, synthetic anti-malarial drugs and sulfonamides were rarely advertised directly.[73] They were, however, promoted indirectly through dense informative, even educative texts. For example, the newspaper *Ve Sinh Bao* (VSB), specialising in the popularisation of health matters and published in Vietnamese from 1927 to 1933, and its successor *Bao An Y Bao* (BAYB 1934–1937) regularly published articles on infectious diseases that contained descriptions of various prescription-only arsenical drugs. The injection, as a mode of drug administration, was also the topic of notes and articles

[70] Stovarsol also quickly became the object of illicit practices: it could be found on the black market in the 1930s, while pharmacists mention forged prescriptions for it and Asian druggists were apprehended for its illegal sale (under other names) (ANVN, centre 2 (Ho Chi Minh Ville), 3715.RSA/HC, "Vente Stovarsol et Tréparsol par un commerçant chinois à Phan Rang, 1936").

[71] CAOM RST NF 6440, Fichier-2793-S. 125- "Vols de produits pharmaceutiques à Thai-Binh"; RST NF 3710, "Note postale 26-S du 25.07.1940 du Pharmacien gestionnaire de la Pharmacie centrale au RST au sujet d'un vol de médicaments au pavillon Pasteur de l'hôpital du Protectorat".

[72] A systematic review of 15 journals, both generalist and specialising on the topic of health, published in both French and Vietnamese between 1914 and 1940 is currently the focus of a research project on "social change in colonial Vietnam" funded by the Social Sciences and Humanities Council of Canada (2006–2009).

[73] Even though at this time, French legislation on drug advertising seems to have been vague enough to allow direct-to-consumer advertising of prescription-only pharmaceuticals in the non-professional press.

from World War I. Emphasising, for the most part, the value and advantages of injections (particularly in terms of therapeutic efficacy), this discourse must have participated in building up a positive sense of familiarity with the technique.[74] More generally, it seems quite obvious that recurrent discussions of bacteriology in the popular press, providing advice on preventing contagion, would have contributed to a growing awareness of the importance of treating diseases such as syphilis, tuberculosis and dysentery. We might even suppose that the Pastorian label gradually came to be seen as a guarantee of medical efficacy, thereby bolstering, even if only indirectly, popular enthusiasm for certain anti-infectious agents—perhaps even especially for Rhône-Poulenc products.[75] I have also found letters of praise sent to various papers, from the 1920s, expressing great satisfaction with the work of particular doctors, both French and Vietnamese; this is indicative both of a process of familiarisation with scientific medicine and of the means by which this familiarisation might have been developed and anchored.

This popularisation of scientific medicine in the Vietnamese press was not necessarily paired with praise for the colonial healthcare system or the promotion of its principles and products. As we've seen, the press regularly denounced AMI agents' reprehensible practises; it also frequently pointed to gaps and failures in the public health system in attempts to protect the public interest. Serving more obvious commercial interests, some newspapers such as the VSB and BAYB contained direct advertisements for a large range of medicines, from science-based pharmaceuticals to secret remedies, including 'hybrid specialties,' or what S. Cochran (2006) has coined 'new medicines,' in which Western and traditional elements and ingredients were combined. It must be pointed out that the VSB belonged to the owner of one of the largest pharmacies of Hanoi, the *Pharmacie Chassagne*, thus playing a double role as an advertising channel and as a vehicle of health promotion.[76] In this, it echoed an ancient Confucian principle valuing self-education in matters of health. Most frequently advertised in these papers were commercial specialties for infectious diseases, particularly venereal diseases, sometimes emphasising their appropriateness for Vietnamese constitutions, and often explicitly comparing their efficacy with prescription-only antibacterial drugs.[77] Such messages thus promoted new forms of self-medication and therapeutic pluralism. At the same time, they certainly reflect a—highly selective—process of appropriation of colonial medicines by the Vietnamese population.

As mentioned above, pharmaceuticals were not initially an important aspect of French colonial health policies; only later did they become significant. In any case, most revolutionary medicines, the really effective medical specialties, were not

[74] Even though, at the same time, these discourses often emphasise the need to go through a doctor obtain access to the technique, and the need for caution given that the procedure was difficult and potentially risky (Nguyen Van Luyen 1931).

[75] *L'Echo Annamite* in particular allows us to discern a process of familiarisation not only with Pasteur and his disciples (through a discourse of praise) but also with germ theory and bacteriology (through a didactic discourse). It should be noted that this is a constitutionalist journal advocating what was then called *collaboration franco-annamite* [Franco-Vietnamese collaboration] and the modernisation—through westernisation—of the Vietnamese population.

[76] There were other similar media, which surely played an important role in popularising not only concepts of health but also of various kinds of Western medicines.

[77] For example, Sigmargyl (*Laboratoires Pomaret*) was advertised in several news media, from 1925 and still in the 1940s, as a gentle and effective oral treatment for syphilis.

accessible, for geographic or economic reasons, to the majority of the population.[78] Still, pharmaceuticals were visible everywhere—in discourses on and experiences of health, in healthcare practises, whether licit or illicit—and seem to have become the object of growing expectations and desires. Pharmaceuticals were also represented, circulated and consumed in a wide variety of forms and networks that extended beyond the strict framework of the AMI and of biomedical technology as defined and used by professional Western doctors.[79]

My research indicates that three types of colonial medicines were adopted with particular enthusiasm by the population: first, a handful of revolutionary drugs, chiefly arsenical compounds and sulfonamides; second, medicines that were described as basic or essential, that is, non-toxic products that were theoretically distributed without prescription and free of cost by pharmaceutical stores created in 1920; finally, commercial specialties of all kinds, abundantly advertised by the popular press, often at lost cost and available in private pharmacies.[80] Although highly varied, the therapeutic indications of these highly desirable products were generally for locally prevalent health problems, and tended to target either benign symptoms and discomforts (coughs, skin conditions, pains, fevers), or infectious diseases, which were often serious and even life-threatening (venereal diseases, malaria, dysentery, tuberculosis). While the popularity of these three categories of products indicates an appreciation of the local value of colonial medicines, it also expresses a process of appropriation that depended on the accessibility of these products, in particular as a function of individual socioeconomic status. Thus, inhabitants of rural areas demanded Santonin and copper sulphate eye drops, while urban dwellers sought out anti-venereal specialties or, when they could afford to, purchased Salvarsan, Stovarsol or Dagenan, sometimes even illegally.

The Vietnamese also expressed the selectiveness of their enthusiasm for colonial medicines in their efforts to avoid official colonial rules and channels of distribution. As noted above, there were significant parallel networks for the distribution of modern anti-infectious agents, and even of injections. I have shown elsewhere that sick people repeatedly sought to bypass the therapeutic relation as it was advocated in the framework of AMI (Monnais 2007: 37–42). We see this in the medical press, for example, in which doctors often expressed a frustration with syphilis patients who left the hospital before the completion of treatment (as soon as the visible signs of disease had disappeared) in the 1910s, and still in the 1930s. Thus, Vietnamese

[78] We think it is crucial to always keep in mind the gap between medicalisation in theory and its application in practise, not necessarily in order to denounce the limits of the colonial health system and its funding, of access to healthcare, and even of so-called modern medicine itself, but rather to understand the impact of these limitations and of their experience on the transformation of colonised populations' representations and practices of health and healthcare. This gap, which raises doubts about models such as Basalla's, has been pointed out by several articles published in EASTS Journal, see for example Liu Shiyung (2008).

[79] By constructing a database of therapeutic drugs, in which we classified every type of manufactured products and substances found in Vietnam, we have exposed not only the density but also the diversity of the therapeutic landscape during this period. This database now contains 869 entries, of which about half are characterised as pharmaceutical specialties (medical and commercial).

[80] Unlike vaccines, synthetic anti-malarial drugs seem to have been the object of persistent distrust, probably due to their preventive use and their highly controlled distribution (Monnais and Tousignant 2006: 142–44).

patients were often described in terms of their "indocility" and their ignorance (of what was good for them, of the need to go through a doctor, of the superiority of Western medicine). During the Interwar period, some doctors would even accuse non-compliant patients treated with arsenobenzols of being directly responsible for an apparent rise in cases of neurosyphilis (tabes dorsalis), which was caused by under- or over-consumption of arsenobenzols, and a tendency to disregard, or broaden, their established therapeutic indications (Nguyen Van Tung 1931: 125–29). Such deviance and its negative consequences on health was also described for the consumption of sulfonamides. Still, according to Dr. Duong Ba Banh, Dagenan was commonly found in Vietnamese medicine cabinets in the early 1940s; it was seen as a real panacea and sometimes even added to Sino-Vietnamese remedies to increase their efficacy (Duong Ba Banh 1949: 80).[81]

This transgression of the colonial rules of medicalisation—which was, to some extent, well-informed—transformed pharmaceuticals into a "site of contested knowledge" (Cunningham and Andrews 1997). Given this context of transgression, contestation and hybridisation in pharmaceutical practises and representations, I suggest that the colonial period, especially from the 1920s to the early 1940s, played a significant role in the emergence of modern forms of patient agency in Vietnam. This Vietnamese history of modern medicines also reveals the extent to which these were part of a mixed economy of health, which included public and private, colonial and colonised, as well as professional and lay dimensions. It also highlights ways in which the colonised subject, through practises of pharmaceutical consumption, became both a "probationary citizen" (Anderson 2006) and a consumer of healthcare (Tomes 2001). Yet, colonial and health authorities were unable to channel and guide this movement. Colonial drugs thereby escaped the control of their creators, their official distributors (including prescribing doctors), that is, their *colonial* owners.[82]

2 From the History of Colonial Therapeutics to the Anthropology of Pharmaceuticals

In approaching medicines as social and cultural objects, as a window on social phenomena (Collin et al. 2006), I acknowledge as important, and seek to include, an analysis of the trajectory of individual drugs and therapeutic classes. Yet, the emphasis placed by historians of science and technology on "drug trajectories" (Gaudillière 2005) does not seem to fully take into account the complexity of the determinants that play a role in the professional but also the popular success—or failure—of a drug; that is, it fails to fully consider the weight of locality (Chambers and Gillepsie 2000; Good 1995) on these trajectories. Here, I have sought to show

[81] In the second half of the 1940s, French commanders would try to prevent sulfonamides and quinine from reaching the Democratic Republic of Vietnam (DRV) forces. Dagenan was already highly prized in DRV-controlled zones. Indeed, for a while it was apparently common to label a well-rounded, all-purpose revolutionary activist as a 'Dagenan cadre' (Marr 1987: 182).

[82] Our point here is not to deny the existence of a pre- or extra-colonial culture of consumption—including of healthcare—which emerged outside the colonial "modernising" influence; this is indeed likely, especially given the proximity of China and of its lively culture of medicinal trade and consumption (Cochran 2006). Interesting parallels could also be drawn with the history of rubber science in Vietnam and of its "involuntary" indigenisation described by Mitichake Aso in this volume.

that the trajectory of sulfa drugs in Vietnam was shaped simultaneously by a context of domination, which facilitated experimentation and the implantation of the French pharmaceutical industry; by a complex Vietnamese learning process about colonial anti-infectious therapies, a process which was both experiential and intellectual, and permeated by power relations; and, finally, by the local, concrete conditions of access to healthcare and to medicines.

The Vietnamese trajectory of sulfa drugs also provides an insight into the colonial origins of the pharmaceuticalisation of societies in the South. From the late 1970s, activists and public health experts have often denounced the harmful economic and health consequences of excessive and inappropriate practises of pharmaceutical distribution, marketing and consumption in resource poor countries. Anthropologists have pointed out the influence of local cultural, political and economic factors on the consumption of pharmaceuticals; and yet, the historical study of the global diffusion of pharmaceuticals and its local impacts as dimensions of modern colonialism remain largely unexplored. It is a well-known and studied fact that nineteenth-century European imperialism emerged as contemporary of modern scientific medicine, resulting in the deployment of colonial healthcare policies. Despite this, the part played by the rapid growth of the pharmaceutical industry in these synchronous developments has not yet been examined. Nor has there been much effort to analyse the local reception of pharmaceuticals as part of the history of colonial encounters and interactions.

Yet, colonial history would seem to be a crucial tool for understanding current patterns of pharmaceutical consumption in ex-colonial settings such as Vietnam, and particularly the emergence of those practises usually labelled as risky (inappropriate consumption, self-medication, non-compliance, harmful drug combinations).

Recent therapeutic trends in Vietnam, such as frequent recourse to unlicensed drug vendors, usually without a prescription, and high levels of (often inappropriate) antibiotic use[83] have mainly been analysed since the 1990s as consequences of the privatisation of the national healthcare system initiated by the *Doi Moi* [Renovation] policies in 1989. With the reduction of subsidies to pharmaceutical factories, many restrictions on the establishment of pharmacies and sale of drugs were removed. As a result, there were increases in domestic drug production, foreign importations grew and the establishment of new pharmacies. According to Okumura et al. (2002: 1875–86) for instance, the considerable popularity of antibiotics is a phenomenon that reveals an excessive popular trust in substances produced by Western medicine and the Western pharmaceutical industry within this new context and an associated mistrust of traditional medicines and the products of the pharmaceutical industries of the former Eastern bloc and neighbouring Asian countries.

But what are the origins of this selective trust, if the importation of pharmaceuticals from the Western world was almost completely interrupted from 1945 to 1975? Furthermore, how, given that a trust in Western medicines seems to

[83] In the late 1990s, the most frequent form of healthcare use in Vietnam consisted in recourse to drug vendors, which, according to the second Vietnam Living Standard Survey (VLSS), accounted for two thirds of all contact with healthcare facilities or professionals (World Bank 2001). Ninety three percent of these transactions were completed without a prescription. Antibiotics were among the most popular medicines in the country which also include analgesics, vitamins, eye drops and tranquillizers. The majority of purchases of antibiotics led to a course of therapy that was shorter than the recommended 10-day course.

be deeply rooted in Vietnamese representations, can we explain the persistent and widespread, even growing, use of traditional medicines, even if this use may be circumscribed to the treatment of specific symptoms and disorders?[84]

A few social scientists have paid more attention to the historical roots of Vietnamese therapeutic practises. David Finer (1999) has highlighted the strong historical role of the media, and in particular of the written press, in transmitting the cultural value of "informed" self-medication; David Craig (2002) had argued that the persistent use of traditional medicines is due to the extremely limited access to Western medical care until the reunification of 1975; while, for Ivan Wolffers (1995: 1325–32), the experience of 30 years of war and severe shortages in sanitary infrastructures and effective medicines gave Western pharmaceuticals an aura of value and efficacy. In its own way, each of these studies shows that recent transformations in the wake of privatisation are also part of a long history of complex, shifting and pluralistic health behaviours. Yet, they attribute to the colonial period only an indirect, marginal or simplistic role in shaping current Vietnamese therapeutic practises.

By analysing the introduction of sulfonamides to Vietnam, I have instead emphasised the importance of crucial transformations that took place during the colonial period, especially from the 1920s to the 1940s, in Vietnamese attitudes towards pharmaceuticals but also, more broadly, towards medicine and science—its methods and techniques, its forms of evidence and of therapeutic efficacy. These transformations took part in an indigenised process of medicalisation which was infused by dynamic local forms of medical pluralism and of health consumerism. These findings can make an important contribution to a broader reflection on the de-territorialisation of scientific objects and techniques and on the globalisation, or rather the multi-locality, of health practises.

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[84] It must be recalled that the Democratic Republic of Vietnam (North Vietnam), proclaimed by Ho Chi Minh in August of 1945, rapidly instituted an integrative healthcare system which sought to align western medicine and "Vietnamese" medicine to provide the entire population with access to the best of both medical systems, including access to a Vietnamese pharmaceutical industry manufacturing its own biotechnologies including vaccines, antibiotics and anti-malarial drugs. The precocious development of this local pharmaceutical industry may not solely be the result of a national and nationalist project; it may also be indicative of the significant influence of transfers of competence, expertise and techniques in the realms of pharmacology, chemistry and industry that took place within the colonial context.

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