

New materialism and old materials: Chemical geopolitics, interoperability and opium determination in the 1950s

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New materialism and old materials: chemical geopolitics, interoperability and opium determination in the 1950s.

ABSTRACT

Geographers have embraced theories of new materialism and in doing so opened up ways of studying and accounting for material agency. These theories are popular, but there are disagreements as to how materials gain agency. I draw on Barry's notions of informed materials to think about the agency of opium seizures and their role in international drug diplomacy. I explain how the science of opium determination evolved and culminated in a UN sponsored program I call the Opium Determination Program. Here, seizures were tested for their origin and this chemical geopolitics drove drug diplomacy. It took place in labs, fields, etc., as well as the halls of the UN. I offer a contribution to new materialist thought by showing how the materiality of opium was couched in broader assemblages that were contextually specific, rather than expounding the importance of materials. Material agency depended on interoperability in geopolitical assemblages. My conclusions are twofold. First, that scholars interested in the everyday sites of geopolitics should examine the sites of 'chemical geographies' and secondly, that the issue of how materials gain agency must be explained.

INTRODUCTION

In recent years, political geographers have become interested in phenomena outside of the traditional spheres of geopolitics. Scholars have studied memorialised landscapes (Waterton & Dittmer, 2014), nationalistic affect (Militz & Schurr, 2016), laughter (Dittmer, 2013; Dodds & Kirby, 2013) and even volumetric and subterranean spaces (Slesinger, 2018; Squire, 2017). In other work, scalar analyses have been disrupted to examine linkages between supranational politics and embodied performances (Dittmer, 2013; Legg, 2009; Marston, Jones, & Woodward, 2005). One area of productive research is that of material agency and its accordant critique of anthropocentrism. Political geographers now try to account for the role of non-humans in complex situations, examining how things influence geopolitics.

This paper contributes to these debates about materials and their agency. I respond to Andrew Barry's (2017) call for a chemical geography that is sensitive to micro-macro scalar connections and human/non-human relations by bringing drug diplomacy into

conversation with Barry's (2005) interpretation of informed materials. I respond in two ways. The first response is empirical. I show how the materiality of opium seizures influenced drug diplomacy at the UN. The chemistry and molecular structure of narcotics was of intense interest to diplomats of yesteryear; they connected the loftiest ideals of diplomats to the technical development of the post-war chemical sciences.

The second response is theoretical: I suggest a new approach for conceptualising material agency in political geography and contribute to debates and critiques of what has been termed the 'vibrant matter' (Bennet, 2010) of materials. Instead of appealing to the vitality of materials, I show how opium seizures and samples gained 'agentic capacities' (Coole, 2013) explaining how they drove scientific progress and influenced drug diplomacy. More than this, I show how the seizures eventually lost their agentic capacities as the focus shifted away from opium toward other narcotics. I explain this through interoperability, defined by Dittmer (2018) as the ways that different nation-states standardise their military practices and harmonise their actions. Within broader geopolitical assemblages, the chemistry of opium seizures proved complex enough that interoperability was never attained between UN member states. The paper thus contributes to political geography and new materialism by showing exactly *how* agency is generated within specific contexts, rather than simply highlighting the importance of materials.

I begin by briefly reviewing recent historical work in political geography and critical international relations that deals materiality and diplomacy (Bull; 2016; Dittmer, 2014, 2017; Hershinger, 2015 Salter, 2015; Walters, 2014). I then explain Andrew Barry's (2017) notion of a chemical geography and apply his work on 'informed materials' to the Opium Determination Program (ODP), a UN sponsored program to identify the geographical origin of narcotics. I show how the chemical makeup of opium seizures was implicated in the legitimacy of the 'producer' or 'manufacturing' status a nation had. The OPD and opium seizures ultimately lost agency as broader geopolitical currents directed UN resources and strategies elsewhere. I conclude that materiality is always contextualised in broader assemblages and the 'sites' of drug diplomacy can be found not just in the UN debating chambers, but the laboratories that analysed seizures.

LITERATURE REVIEW

Political geography and new materialism

Proponents of new materialist theories charge that the social sciences have neglected the agency that objects exert upon human beings, their social formations and politics. For Elizabeth Grosz (2008, 19), 'nonhuman forces – from the smallest sub-atomic forces to the operation of solar systems ... connect the human to all that is both human and non-human'. For Karen Barad (2014), post-humanist performativity makes matter, 'matter' once more. Materials enact their roles depending on the situation they are within, much the same way humans behave differently depending on their surroundings. Pushing new materialism to its limits, Harman suggests that materialism is better thought of as immaterialism, where forces in the world are not reducible to representation via discourse, objects, and agency, but are defined by both. His study of the Dutch East India Company conceptualises the company as a symbiosis of ideas, objects, and thoughts (Harman, 2008). These critiques take issue with anthropocentrism; they critique the academic tendency to prioritise human agency in complex systems.

Dittmer (2015b) noted how treatments of materiality and the non-human were absent from the earliest studies of critical geopolitics; studies conducted in the 1990s and 2000s were characterised by words, ideas, and discourse whereas studies of affect, embodiment and materiality are now commonplace. Notwithstanding other work that nuances human agency (Wylie, 2016), dissatisfaction with the dominance of representation and discourse in critical geopolitics grew from feminist geopolitics and feminism more broadly, which argued for an analysis of gender in capitalist systems and, especially, their embodied impacts upon women (Enloe, 2014; Sharp, 2007). In popular geopolitics, scholars accordingly examined how dominant discourses and satire are shaped by technology that set ground rules for how audiences and popular culture creators engage with one another (Kinsley, 2014; Thorogood, 2018). With these theoretical insights came work on the lived experience of geopolitics (Pain & Smith, 2008), the affectual experience of nationalism and model UN scenarios (Dittmer, 2013; Militz & Schurr, 2016). These ideas have influenced critical geopolitics by complicating our understandings of what constitutes the 'material' or non-textual world (Anderson & Wylie, 2009); we are no longer just interested in things, but ideas, affects as well non-human materials (V. Squire, 2015).

There has also been work on what might be termed diplomatic materials (Dittmer, 2015a; 2017) For example, Slesinger (2018) notes that subterranean tunnels into Israel from Gaza not only provide access for militants engaging in guerrilla attacks, but violate traditional understandings of territorial sovereignty. He argues it is only by grappling with the physics and mathematics of 'frequency ranges, magnetic fields, electrical conductivity and reflection coefficients, that the material agency of soil becomes apparent' (2018, 6). William Walters (2014) explores the role of missile fragments as evidence for illegal drone activity and airstrikes in Gaza. He examines the intersection of the scientific methods governing materials and political debates over military action, areas which are usually conceived as separate realms of study. Instead, he shows how legality of drone strikes were predicated on the story told about the materiality of missile fragments.

Critiques of new materialism note that the rush to embrace its ideas has left conceptual questions unanswered. Lyne Huffer (2015:124) critiques Elizabeth Grosz and Jane Bennet for turning away from epistemological questions. She warns that new materialism evades the historical *a priori*; 'that we are both bound and un-bound by the temporal contingencies through which epistemes emerge and topple.' David Chandler's critique of Jane Bennett's notion of vibrant matter takes issue with the *a priori* acceptance of material agency. For Chandler (2014) new materialists prefer ideas of emergence and complexity and this leads to an unknowable world. Chandler suggests that proponents of new materialism believe we will better 'adapt to the world when the modernist belief in universal knowledge and the belief in its development towards certainty are removed'. In other words, the new materialist critique of human knowledge is important, but by putting their faith in uncertainty and contingency of materiality: there is no need to explain how materials act if that are unknowable and indeterminate. Barnett and Bride's work on problematics of 'the urban' is also relevant here. A problematic approach requires us to 'leave behind the search for a coherent object of urban analysis. It means instead focussing on what it is that makes knowing about cities and urban processes important in particular conjunctures' (2017:1191). The emphasis on the politics of knowledge production, or how we come to care about issues such as 'the urban' or 'materiality' is important to my work. We must show how a scientific perspective of the chemical sciences opium seizures came to be important to diplomatic debates.

The value of new materialist thought lies not in explaining that materials matter, but in explaining how materials gain their agency in specific instances and why knowledge production is important to diplomatic affairs. To do this, I draw on Andrew Barry's concept of informed materials and Dittmer's notion of 'interoperability'.

Chemical Geography and informed materials

Andrew Barry (2017) called for a 'chemical geography' at his inaugural lecture at University College London. Barry traced the term to a speech made by William Jackson Pope, Professor of Chemistry at Westminster University and member of the Chemical Warfare Committee of the Ministry of Munitions. Barry notes that in 1918, Jackson called for a new discipline of chemical geography to bolster the British Empire's activities and scientific prowess. Barry accordingly suggest we take seriously and critically examine the role of chemicals, chemistry and its role as a science in the service of imperial expansion and warfare. Barry's (2001) notion of informed materials provides nuance for thinking about chemicals and agency, specifically when it comes to molecules. He notes that, 'a material analysis of politics is one which must attend to the resistance of matter to political control' (2001 26). However, he moves beyond *a priori* materiality. That is, Barry (2001) acknowledges that as a service science, chemistry is often driven by external socio-economic forces. Unlike physics, chemistry does not always progress from first order principles or discovery. Often, a product or chemical is required in industry. Chemistry is a 'new form of empiricism [chemistry] produces substances, the properties of which cannot be derived from general laws' (2005:57). This has implications for thinking about materials. Barry notes that an oxygen molecule 'that is isolated and purified in the laboratory will not have the same properties as it has in the field, the city street or the body' (2005:57). This is also true of opium seizures. The ODP had trouble separating the chemistry of opium from the reality of seizures.

In *Material Politics: Disputes Along the Pipeline*, Barry (2013) investigates the role of scientific knowledge in political controversies. He analyses the Baku-Tbilisi Ceyhan pipeline, an international project that brought together companies, nations, and protestors who produced conflicting narratives about the pipeline. The analysis involves materials (soil, metals, insulating materials) but it does not proceed from a point where materials *must* have agency. Material agency emerges at specific moments when protestors, contractors and companies disputed the pipelines safety. They

produced new information and knowledge about materials by testing materials. Much of the public interest in the Baku-Ceyhan-Tbilisi pipeline was due to geopolitical concerns over energy security and territory. Technical matters went frequently unnoted, left to BP and other corporations involved in construction, yet these technical matters eventually became central to claims about the legitimacy and legality of the pipeline for both detractors and advocates. The informed materials were invested with information, but that information was by no means agreed upon as true. Disputes over materials led to very real political debates about the effects of the pipeline. Barry's work is not so much an argument for an *a priori* material agency, but for material specificity. He pinpoints that scholarship needs to attend to where, when and how materials became informed and influential.

Barry's work can be put into dialogue with geopolitical work that focuses on Deleuze and Guattari's notion of assemblage. Dittmer (2017; 2018) describes assemblages as heterogeneous collections of ideas, affects and materials. They are open and becoming and constantly shifting due to changes within the assemblage and outside of it. They can never be strictly defined due to constant changes, but they can be pinpointed with careful description and explanation. Dittmer uses the concept to think through interoperability of the US Navy and other navies. Interoperability is the ability of different organisations, nations, and military forces to function together, conducting joint operations and sharing common doctrines. Brian Massumi's (1992: 14) analogy of a wood worker carving a block of wood in his users guide *Capitalism and Schizophrenia* is useful here. Agency emerges when 'the interrelation of relations crosses from one substance (the thingness of tools and wood) to another (the ideality of thought).' Both Massumi and Dittmer point to interrelations. It is not just the case of materials and ideas creating effects in the world, but their links to different assemblages that is important. We cannot explain the agency of opium seizures in the ODP without looking at its relations to broader geopolitical events and ideas.

It therefore is possible to tackle the historical *a priori* and situate material agency in specific geopolitical assemblages. This requires being open to 'learning from contingency (Barry, 2005:53). As Barry notes, chemistry is a service science that proceeds and evolves from external socio-economic forces. This is true of the opium determination process for geopolitical agendas. New tests, methods and ways of

describing materials emerged due to broader geopolitical pressures. There are specific historical moments where geopolitics and scientific progress align and material agency emerges to produce influences and effects. There are also moments where they break away and de-operationalise. Here, material agency dissipates.

Using interoperability and informed materials as conceptual tools to account for material agency is useful for scholars interested in diplomacy. The forensic analysis of nuclear materials (Betti, Tamborini, & Koch, 1999), illegal weapons (Dumlao, Sinues, Nudnova, & Zenobi, 2014) and illegally traded ivory, (see Comstock, Ostrander, & Wasser, 2003) are three commodities where chemicals and chemical analysis play help determine the (il)legality of an act under international law. They can produce disputed accounts of materials but also end disputes about materials. They require interoperability amongst states challenging international black markets, but also amass public support, funding, strategies, moral discourses, policy documents and many other elements vital to their success. A UN field test of the DNA in illegal ivory is nothing without the moral and legal authority of the UN backing it up. Jasanoff and Kim (2009: 123) describe these broader elements as a socio-technical imaginary, where visions of the future are transformed into realisable political goals in the present. A socio-technical imaginary is by no means a simple representation of an issue that is repeated in the news and media; it operates in between 'public opinion and instrumental state policy'. It shapes government activity, the allocation of funds and, in this instance, the development of legislation.

In the rest of this paper, I use these ideas to show how opium seizures gave rise to, and then impeded, interoperability amongst different nations at the UN. It is worth briefly reviewing salient literature in drug diplomacy to outline the paper's empirical contribution and the value of a geographical perspective in this field. Historian Dan Malleck (2015) argues there are many 'realms of understanding in which opium existed' during the 1800s (2015, 6) and the boundaries between a legal and illegal use of a substance were still much blurrier in the early 20th century, prior to 1961, the year of the passage of the watershed Single Convention on Narcotic Drugs (McAllister, 2000; Musto, 1999; Taylor, 1969). Melissa Bull (2016) refers to the early 20th century drug-related UN organisations (the Drugs Supervisory Body and International Narcotics Control Boards) as centres of inscription. She examines the administrative body of

international drug control, the Drugs Supervisory Body (DSB) of the League of Nations and UN, together with the monitoring organisation, the Permanent Central Opium Board (PCOB) and suggests they were 'centres of calculation', or organisations that governed through the 'accumulation and distribution of information' (Bull, 2016, 88). Likewise Eva Hershinger (2015) shows the lists of controlled substances that constitute the targets of international drug laws often struggle to accommodate the changing combinations of chemicals. Hershinger concludes that international drug law 'is one – if not the – major place where the ambivalence of drugs is negotiated, where the need to govern and supervise drugs is cemented, and where accordant power relations are established' (2015, 184).

Both Hershinger and Bull examine how chemicals were governed, and in doing so point to changes in laws in the 20th Century. We know much less about the chemicals themselves, particularly their role in influencing diplomatic affairs, nor have we examined how chemical and geographical knowledge were exploited for diplomatic purposes.

Nations invest resources and share information when determining the geographical origin of commodities. This geographical component of drug diplomacy has clear explored import for political geographers. I now explain the contingent agency of opium seizures by conceptualising them as informed materials in the context of the ODP and broader geopolitical assemblages.

THE OPIUM DETERMINATION PROGRAM

The term 'narcotics' refers to a family of drugs (opiates and opioids) that share similar qualities: they deaden pain, depress respiration and induce constipation and sleep. Synthetic narcotics such as fentanyl and hydrocodone are either semi-synthesised from narcotics such as morphine or created from entirely different chemicals while still mimicking the effects of opium.

What does it mean to think of narcotics as informed materials? First we complicate the idea of opium as a coherent chemical. Within raw opium, there are many other narcotics. The most commonly and useful alkaloids are the phenanthrenes of morphine, codeine, and thebaine, but also non-narcotic isoquinolines of papaverine and noscapine. The relative proportion of organic material within opium influences its form. The

morphine content of Indian opium is generally higher than opium grown in China. The purity of raw opium, defined by the proportion of useful alkaloids (phenanthrenes), was just one of many properties of opium that was of interest to chemists in the ODP.

The informational environments of narcotics that lead the UN to create the ODP are important here. The Pure Food and Drug Act of 1906 was the first American legislative act that required manufacturers to label their product's ingredients. Smugglers did not provide the same courtesy. In 1909, when the Smoking Opium Exclusion Act outlawed opium smoking and its import (Musto, 1999) the informational environments grew. They included anti-chinese sentiment that had been encouraged by the medical community's warnings about the possible contagion of the 'Chinese' behaviour of opium smoking (Ahmad, 2000). Opium imported for smoking thus had to be distinguished from legal imports of opium and other narcotics. US customs agents and the Narcotic Division of the Treasury developed methods to determine where seizures of smuggled opium came from. They would make inferences from crude proxies: a seizure's purity, appearance, packaging, the testimony of crewmen, and the suspect ship's itinerary. In 1914, the Harrison Narcotics Act provided the Narcotics Division of the Treasury with a tool for tackling foreign seizures. The Harrison Act was an 'excise tax ... to be evidenced by stamps affixed to packages or container and payable by the importer, manufacturer ... i.e., the first domestic handler (King, 1957, 118)'. Stamps played an integral role in delineating the opium and opiates arriving at American shores. Narcotics that entered the country and did not have the correct stamps were understood to be trafficked. The 'mere possession of drugs in unstamped containers [was] prima facie evidence of a violation' (King, 1957, 6). The act distinguished, materially, between illicit and licit narcotic imports. This demarcation was not dependent upon the chemical itself, but its attendant information. It was not illegal to possess or trade narcotics; it was illegal to not pay taxes on them. Only official importers were granted this right by the Treasury, so violations of the Harrison Act were not due to possession, but the avoidance of tax. Materials did shape narcotic regulation and agency emerged from the materials, their informational environments and wider geopolitical trends.

Two international conferences were held in 1909 and 1912 that laid foundations for an international system of regulation, but they lacked teeth. The first was non-binding and the second asked nations to end drug abuse but remained vague on specific steps

(McAllister, 2000). Chemistry featured also in these debates and shaped geopolitical goals. Much of the politics surrounded the need to harvest new types of poppy flower (*papaver somniferum*) for opium used as medicine during the First World War. The so called black opium of Turkey was of higher morphine content than that of Indian opium and often used in the production of morphine. Indian opium was prepared for smoking or eating. This was, experts thought, primarily due to the method of opium extraction. Both countries used a method called lancing, where poppy capsules were pierced with a knife allowing the raw latex to collect on the outside of the capsule. In India, opium was lanced buds more than once, decreasing the proportion of morphine (Annett, 1920). The ash content of different opium seizures had also been shown to vary geographically (Annet and Boos, 1925). During the First World War, raw opium from Turkey was cut off due to the closure of shipping channels in the Mediterranean. Nations scrambled to source alternative crops. Illicit seizures grew after the war and the US, upset with the lack of progress and commitment from other nations, withdrew from international debates and did not sign the 1925 Agreement Concerning the Manufacture of, Internal Trade in and Use of Prepared Opium. They returned to the table to sign the Convention for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs 1931 (McAllister, 2000). This agreement delineated between the medical, scientific value of licit drugs and recreational or habitual use of illicit drugs.

The US Federal Bureau of Narcotics (FBN) was the US drugs regulatory agency from 1930-1962 (McWilliams, 1989). In 1937, the FBN submitted a report entitled *The Traffic in Narcotics* to Congress that highlighted the problems of using proxies such as labels, stamps and ships itineraries to determine a seizure's origin.

A total of 344 kg and 205 grams of smoking opium was seized and confiscated during the calendar year 1937. The exact origin of this smoking opium could not be determined, but the great bulk was undoubtedly manufactured and packed somewhere in the Far East, since it was seized from vessels arriving directly or indirectly from Eastern ports (FBN, 1937, 75).

The problem partly came from the increase in new tins, packets, and containers in which seizures were found.

The most common marks were “Am Kee” (Rooster and Elephant), “Yick Kee” in the Atlantic and Pacific coast areas; “Lam Kee” in the Hawaiian Islands and “Lion” and “Tonggee” in the Philippine Islands ... Labels not previously encountered in the United States were the “Running Deer” “Lion Brand Special” and the “Three Coins” or “Three K’s” (FBN, 1937, 13).

Other labels such as ‘TaiKeeCo ltd Manufacturing Chemists’ and ‘Bremen-Shanghai’ were believed to be fakes attempting to hoodwink customs agents into believing they were legitimate imports. To compound this problem, the geography of the illegally produced opium was growing more complex.

All available information indicates that illicit traffickers continue to rely on the Far East for supplies of prepared opium, while France, Yugoslavia and Italy were used as bases for smuggling of raw opium, and heroin into the US. It was likewise evidence that Australia was, for a time, at best, the base for smuggling of prepared opium into the Hawaiian Islands (FBN, 1937, 12).

During the Second World War, interest in opium determination declined as traditional shipping methods through the Mediterranean were shut. As Collins (2015) notes, the focus turned to procurement of morphine for medical purposes. After the Second World War ended, both the US and newly formed United Nations returned to the project of opium determination. Opium determination grew out of a belief in science and the scientific method. Krige & Wang suggest that science and technology, emerged from WWII as ‘major forces for destruction – and liberation – [and] propelled their practitioners into positions of influence’ (2015, 171). In 1951, the president of the AAAS (American Association for the Advancement of Science) Rodger Adams described a vision of the future global order where the chemically sophisticated nations prospered. He did not want the US to become ‘technologically unsuited to a future in a strictly chemical world’ (Adams, 1952, 137). As Reiss suggests, ‘Adam’s geopolitical hierarchy was shaped by a faith that the capacity to chemically alter raw materials was a marker of national superiority’ (Reiss, 2014, 113). Materiality came to be of scientific interest because of what it might reveal about less developed nations and their grip on the drugs trade.

In 1945, the United Nations Economic and Social Council (ECOSOC) took command of the League of Nation's drug operations (McAllister, 2000). They created a Commission on Narcotic Drugs (CND) that reported directly to ECOSOC and power was transferred in 1946. The CND established a quarterly bulletin entitled the *Bulletin on Narcotics* (BoN). In its first issue, it addressed the crux of opium determination: 'where does all the opium come from that provides the illicit traffickers with their wares and the clandestine factories with the raw material for the manufacture of drugs for the illicit market?' (BoN, 1949, 8).

The article outlined how different geographical and cultural factors could help chemists and custom agents identify a substances origin. In the 1950s, certain types of opium (Turkish) were still more valuable to the legal trade, as more morphine could be extracted to create opiates and other medicines. Indian opium was known to be oily as Indians tended to add oil to opium in preparation for opium smoking (Rakshit, 1926) and less valuable than higher morphine Turkish opium. This meant they could be crudely distinguished by a discerning customs agency or chemist.

On 5 May 1948, Charles Fulton, a chemist working with the Internal Revenue Service, FBN and Narcotic Division of the UN Secretariat, submitted a report to the CND outlining a scientific method for determining opium origin through microscopy. So began various investigations into methods to determine the origin of seized opium. In 1948-1949, two resolutions were adopted by ECOSOC (E/RES/159(VII)/IIC and E/RES/246/F (IX)). These constitute the Opium Determination Program (ODP). The first invited governments to send samples of legally produced opium to the US and also asked participating governments to encourage and offer scientists and laboratory space for opium determination. The second allowed the Secretary-General to accept facilities offered by the US (BoN, 1956a). Of the 29 countries who replied to the invitation, only nine replied (Austria, Bulgaria, Canada, India, Japan, Netherlands, Norway, United Kingdom of Great Britain and Northern Ireland and United States of America, (BoN, 1994). Much of the work was done in New York in laboratory space owned by the Treasury Department (of which the FBN was a division, see Eads, 1945).

Illicit seizures of all drugs had increased in the post-war years (Table 1); the ODP produced encouraging results at a geopolitically salient moment in the development of drug diplomacy.

TABLE 1: GLOBAL POST-WAR OPIUM SEIZURES. SOURCE: (BoN 1953A)

Year	Kg
1946	22,413
1947	18,389
1948	17,948
1949	20,503
1950	46,286
1951	39,492

The scientific process achieved during this era reflected the dominant liberal order of the time (Shapin & Schaffer, 1985). The developed markets of the European and American manufacturing and pharmaceutical industries were deemed superior to the opium cultivating regions of the world. This narco-geography was seen to be marked by technological superiority and adherence to international law. The hinterlands of opium production remained discursively constructed dangerous, wayward, and unregulated. Through opium determination, the UN became interested in technical solutions to a diplomatic problem: persuading nations whose opium did appear in the illicit traffic to suppress the production of narcotics at the source. This was the defining issue of previous international developments: nations struggled to agree on how much responsibility producing and manufacturing nations should shoulder for the illicit drugs trade (McAllister, 2000). Since most production and manufacture of synthetic and non-synthetic opiates took place in the USSR or developing and decolonising nations, opium determination was a seemingly apolitical method of proving that illegal opium reaching foreign shores from a specific nation. Chemical opium determination did not account for the nationality of a smuggler or vessel, nor did it point fingers at governments. In principle, it could not lie nor deceive. A correctly identified seizure would simply point to a geographical region of origin. In its seeming 'apoliticalness', it became the perfect political tool for Western diplomats navigating the sensitivities of Cold-War diplomacy. Even if the ODP's work was apolitical, its purpose was geared towards preserving the integrity of the international system that ensured states maintained a legitimate

monopoly on the exchange of valuable materials. The ODP was a place in which information about the illicit drug trade could be exchanged compiled and analysed to stem the illicit drug flow.

Initially, ECOSOC requested that governments submit samples from the legal traffic to the laboratories (Analytical Chemistry, 1952). After some early successes, this remit was expanded to include illicit seizures in 1952. ECOSOC adopted another resolution (E/RES/1952/436(XIV)F) that put research into the origin of opium seizures squarely within the purview of the international community. ECOSOC,

Noting the progress made in research work into the origin of opium,

Desiring to extend the research to cover all types of opium produced in the world,

1. Requests governments to send to the United Nations Research Laboratory for analysis samples of all opium seized in illicit traffic; and
2. Instructs the Secretary-General to study and submit to the Council, at its fifteenth session, a detailed estimate of the cost of preparing and equipping a laboratory, preferably in the Secretariat building of the United Nations, large enough to handle the increased research work (CND, 1952).

In 1955 morphine's stereochemistry (the spatial arrangement of a molecule's atoms) was confirmed by Nobel Prize winner Dorothy Hodgkin of Oxford University (Li, 2014). This was useful for ODP researchers. It let them study the molecule in the abstract, divorced from the context of chemistry and geography. Charles Farmilio published many of his findings in the *Bulletin on Narcotics* (Genest and Farmilio, 1959) along with other ODP researchers (Levi, Hubley and Hinge 1959). Their findings suggested that a county, perhaps even a region, could be inferred due to the opium poppy's geographical adaption to specific soil and climate.

In 1954 Paul Martin, Minister of Health for Canada, announced a provisional way to determine opium's origin 'beyond reasonable doubt' (*Chicago Tribune*, 1954, 10). Martin noted that the success of Canadian researchers was dependent on the sharing research and volume of exchange at the UN: interoperability. If opium determination

were to be credible, it would need to be a uniform and thorough practice that could be repeatable and replicable across the globe.

The UN established a 'committee of experts' to determine whether the laboratory methods had applications in the field. The committee was so impressed with the progress made by the FBN that in 1956, the UN's Division of Narcotic Drugs established its laboratory for determining the origin of opium under the moniker of the Opium Research Project. All agreed the process would benefit from more laboratory facilities being made available.

The ODP was ultimately meant to provide a compendium of opium samples that were chronicled. But more than this, it would create standardised methods so that standards for each nation's opium signature could be deduced. It was only when these samples were chronicled, ordered and tested in concert that the messiness of opium's chemistry could be compared to a vast database of other seizures; that its assemblage would be territorialised. The absolute value of a sample's morphine content, its colour, organic content, ash content and microscopic profile were worthless: if all opium contained 16% morphine, there would be no point in measuring it. The samples became both scientifically and geopolitically meaningful when the differences in relative values of morphine content were recorded on paper. Interoperability between the US and UN labs was vital. This is obvious in the attempts to try and harmonise the process of opium determination across multiple laboratories. If a determination were to be credible, results produced at one laboratory would have to be repeatable at another, using the same methods and equipment.

But this didn't happen; the ODP project was undermined. This was not due to a seizure's 'vibrant matter', but rather the emergence of agentic capacities that emerged in the mid-1950s. On the 14th December 1954, the UN General Assembly adopted a resolution (A/RES/834(IX)) that proclaimed a more sophisticated laboratory was needed. This was set up in Division of Narcotic Drugs (DND) at the Palais des Nations in Geneva. The UN's DND laboratory specialised in 'routine chemical analysis, paper chromatography, paper electrophoresis and equipment for opium ash analysis using spectrographic and spectrophotometric methods' (Analytical Chemistry, 1958, 19). Governments were requested to send clearly identified substances that would be used to catalogue the various types of opium around the world. The aforementioned expert committee

estimated that three different sets of samples would be needed to produce a comprehensive database. The first was a set of the salts of the opium alkaloids of accurately known composition; the second would be exported opium where the composition had been determined, including major and minor alkaloids (there are twenty in raw opium) in the opium and ash. The third was a set of ten authenticated blocks of opium unknown to the laboratory, who would then use their methods to see if their conclusions matched the authenticated samples. Proxy methods such as labelling, ship's itineraries and suspect testimonies could then corroborate findings from the lab on illicit seizures.

The expert committee broke down the testing into two groups, one that could be applied in labs across the world (including micro and macroscopic analysis of appearance, unified analysis, and the punching and sorting of samples). The more specialised, secondary methods were to be performed by another group at the Geneva lab, whose work was considered essential. As such, no single chemical test was designated as sufficient for opium identification. Instead, the UN laboratory developed a 'single unified method'.

Researchers first undertook basic microscopic examinations of the samples' adulteration, colour, form, texture, covering and odour. This would give a preliminary result. Microscopic examinations gave a rapid screening and indication of the profile of a substance, but could not provide a conclusive origin without further, extensive analysis. More accurate methods, particularly spectrographic methods and electrophoresis were then used. These required expensive laboratory equipment, technical know-how and time.

The problems of measuring unknown seizures became obvious with these advanced tests. First, a single part of a seizure might not be consistent with other parts of the same seizure. A seizure could often contain a composite of different types of opium. The assumption that OPD advocates made– that samples were homogenous and would contain opium from a single location – was unrealistic. If a sample did make it through the method – and the steps were fully followed– an origin might be provisionally determined. It could not, however, be located to anything smaller than a region or country. For every sample that was successfully authenticated and analysed, a thousand variations in the chemical composition of actual seizures and ash content could

confound any certainty over its origin. Second, the number of variables that could change the chemistry of a seizure kept growing. Opium was a multiplicity which had 'no need whatsoever of unity in order to form a system' (Deleuze, 1994, 182). Research was undertaken on fertiliser (BoN, 1956b), soil, slope, latitude, and also the variations in each alkaloid found within a sample (BoN 1956c). With such variation, cataloguing the full spectrum of results was a daunting task.

There were many cases where two possible locations were submitted to the CND. It is worth repeating the conclusion of a 1953 report in the BoN (1953b, 14) in full.

'though some conclusions might be expressed in terms of probabilities, this is not the aim of the research. Rather, the aim is to prove the origin in specific cases "beyond a reasonable doubt". This does not mean that the origin will or can be proved by laboratory methods beyond all possible doubt, but that the evidence assembled will be entirely convincing to reasonable men.'

Of course, no scientific test could determine what constituted a 'reasonable doubt' or a 'reasonable man'. A location identified by ODP researchers were easily disputed by the accused nation. Material agency emerged from contested informational environments, disagreements that started to de-operationalise the ODP.

A second set of problems were diplomatic. As per the ECOSOC and CND resolutions, the ODP was entirely reliant on samples supplied by producing nations and pharmaceutical companies. Most pharmaceutical companies obliged, and medical grade samples from pharmaceutical companies were useful, but researchers required reliable samples from the illicit traffic from across the world. In 1955, the CND adopted a resolution (Res BI(X) that reminded governments of their obligations under the 1931 Convention to report the origin of seizures to the UN. They went one step further, and recommended that these reports should contain a provisional determination of origin. Some nations deferred on sending regular samples (BoN, 1956d). While India, an important producer of licit opium, submitted 167 authenticated samples of Indian opium, Iran submitted 32 authenticated samples and Afghanistan, 3 (BoN 1958). The USSR did not submit any. Even nations that did submit a sample could cause further confusion by not sending accompanying information. This was the case with Yugoslavia, where one authenticated sample contained multiple lumps of opium. No indication was given to which region of

the country was sourced from. Nations that suffered illicit production also deferred. Burma, the Korean Republic and Mexico had only submitted one authenticated sample by 1958 (BoN, 1958). This forced the CND to pass another resolution (Res.V(XIII)) in April 1958 where it

Urged the Governments of the following countries: Bulgaria, Greece, India, Iran, Japan, Pakistan, Turkey, the Union of Soviet Socialist Republics and Yugoslavia, to provide or continue to provide the United Nations Laboratory with sufficient authenticated opium samples from the various regions of production inside the country over a period of years covering possible fluctuations in local production, accompanying each sample with the following information: year of production, precise locality of production, details of harvesting - e.g., first or second lancing, weight of the sample, whether it is opium from one cultivator or several neighbouring cultivators, local name of the variety of poppy and other relevant data (CND, 1958).

The third set of problems in the ODP were technical and financial. The ODP was methodologically complex. 40 scientists from 20 countries submitted data to a small team at the ODP (BoN 1956d). There were only three full-time chemists in the DND laboratory (Analytic Chemistry, 1958) and the US laboratory was ill-equipped to perform the unified method. The laboratory had, despite problems of procurement, 500 samples to analyse. Comparing the results of multiple variables was far too time consuming for routine analysis (BoN, 1994).

In the late 1950s the amount of raw opium trafficked globally declined. It was easier for traffickers to grow and manufacture the drugs in illicit factories in the less regulated regions together. Manufactured narcotics such as heroin and morphine were less bulky than opium and captured a much wider market. The 1956 *Traffic in Narcotics* report notes that whereas 5Kg and 245g of opium had been seized (compared with 15kg and 56 grams in 1955), the quantity of heroin seized was 58kg and 742g (compared with 70g and 965g in 1955, see FBN, 1956). By 1963, heroin had become 'by far the most important drug of addiction, at least in the Western world' (BoN, 1963, 37). As the world's appetite for morphine and heroin grew, the traffic and seizures of these alkaloids increased, opium determination became less important. The ODP deterritorialised and reterritorialised to a new purpose. The UN labs shifted towards

opiate analysis and identification in the field. Analysts focused on the substance and its toxicity rather than the country of origin (BoN, 1962). The DND laboratory became a hub for regional training and reference samples around the world (BoN, 1984). It went on to have many successes, particularly for the rapid identification of unknown substances in the field. Cocaine tracing has been a particular area of success for anti-drug agencies around the world (Ehelering, et al., 2000).

Discussion

The ODP reflects the pinnacle of post-war hopes: that the scientific method could help solve many of the problems that traditional diplomatic methods were failing to tackle. The properties of a seizure were revealed by the ODP's single unified method but materially, the sheer number of confounding variables within an opium sample made determination impossible. The ODP did not deliver its intended goal, but this does not provide materials with an *a priori* materiality that stubbornly resists human action. Instead, it points to the specificity and contingency of material agency; broader changes in drug trafficking and policy during the 1950s and early 1960s. The ODP's failure was also due to the problem of conceptualising opium on paper, in the lab and limits in funding and knowledge. The underwhelming amount of seizures submitted impeded the chemists' efforts to create a compendium of samples by country and region. By the same token, the time and cost of analysing samples meant a quick, routine method of analysis was never available to different nations. Opium seizures did not undermine the ODP by dint of their resistance to human action. Instead they, together with lack of cooperation by some human actors, impeded the interoperability that the ODP needed to function.

Until recently, critical geopolitics was concerned with the 'big hitters' who gave speeches, wrote treatise or commanded troops (Dittmer, 2016; Massaro & Williams, 2013), with feminist scholars pushing the discipline towards more peopled, everyday experiences of geopolitics (Pain & Smith, 2008). Likewise, in the field of drug diplomacy, much of the focus has been on diplomats with plenipotentiary powers, UN/League of Nation personnel or anti-narcotic crusaders that dominated the speaking circuit (See McAllister, 2000; Taylor, 1969). A new materialistic approach is useful; it directs researchers towards the correspondence between chemists and diplomats yielded and the roles materials played in shaping drug diplomacy. Chemists were brilliantly attuned to the materials, ideas or objects in question.

However, materials mattered in very specific ways that can be isolated and explained. It was not a question of their innate agency, but their agentic capacities that emerged in broader assemblages. These capacities are interrelations with other elements in an assemblage. McCann and Ward (2011) use the notion of urban assemblages to describe how policy is made and materialises in specific places and times. These are determined by local practices rather than any scalar, or hierarchical authority invested in authority figures or institutions. Similarly, De Goede focuses on the policy implications of assemblages. Financial services, corporations, and legislation impact the multiple paths that illicit flows of money take. She considers formal stakeholders, but also technical advisors, mid-level bureaucrats, and administrators who shaped policy debates. The lessons of this research are that technical minutia – what Painter (2006) has called ‘state effects’ and the prosiacs geographies – gave materials their contingent agency.

Barry sees knowledge production as a process of demonstration, where an object is made visible to an audience in a technological society. Shared standards and metrics create a homogeneous zone in which geographical or social difference can be eradicated. Dittmer (2018) refers to this as interoperability. Both authors point to specific instances where agency emerges and matter ‘matters’. Opium seizures had agency; they helped organised a massive, international funded project of massive diplomatic import during the 1950s. Opium determination permitted a chemist to demonstrate, and thus allowed diplomats to speak with authority about, an object out of the context within which an object or issue is encountered. The ODP was an anti-political space. A political action may seek to open ‘new sites and contestation’ (Barry, 2001, 104) whereas an anti-political action would seek to close it down. As Barry notes: ‘in those international political arenas in which consensus might be difficult to reach ... science and technology can have a large role to play’ (2001, 8).

CONCLUSION

Materiality helps tell a more complicated, comprehensive story about drug diplomacy, but it does not tell the whole story.. When thinking about how the role of materials in the OPD progressed, we cannot boil agency down to individuals who worked in it or funded it, nor to the seizures that refused to give up their geochemical secrets. Instead, it is the agentic capacities that matter. The most accurate and substantial determinations did not just rely on new chemical tests, but had to be confirmed by

comparison with other samples. This was dependent on wider diplomatic relations between nations, and social relations between chemists and other colleagues. But it was also conditioned by its interoperability with broader assemblages. By examining the 'circuits through which matter flows' (Coole, 2013, 62) we gain a more sophisticated and specific account of how materials act and influence diplomatic affairs.

The paper has two valuable findings. One is the empirical value of expanding the study of political geography to include drug diplomacy, to study what chemists and diplomats expected of geographical differences in the bio-chemistry of opium seizures. The other is the theoretical value of a new materialistic approach to drug diplomacy that decenters diplomats *and* materials to focus on their interrelations and their relations to broader geopolitical assemblages. For researchers interested in commodities that circulate in the international sphere, the scientific and technical governance of objects reveals much about diplomatic practice. This approach helps scholars develop a transcendent empiricism where 'the abstract does not explain but must itself be explained' (Coleman, 2013, 13).

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