

# HISTORY OF PHARMACY SIG NEWSLETTER

## *Pharmacy Chronicles: Past, Present, and Future*

### **WELCOME MESSAGE FROM THE CHAIR, HISTORY OF PHARMACY SPECIAL INTEREST GROUP**

**Welcome!** to the seventh issue of the History of Pharmacy Special Interest Group (SIG) newsletter, *Pharmacy Chronicles: Past, Present, and Future*. This peer-reviewed newsletter has served as a medium for SIG members to share their interests and keep the history of pharmacy alive for six years now. Thank you to those who have contributed! Also, a special thanks to Cathy Taglieri, for her work as editor since the beginning, to Bernie Olin for joining Cathy as co-editor this year, and to all the peer-reviewers who dedicate their time to make this newsletter the success it is! Exciting things are planned for the 2019 annual AACP meeting in Chicago. Our SIG is sponsoring a session entitled “Evolution and Application of US Marijuana Laws to Pharmacists in Medical Cannabis Dispensing Roles”. Attendees will learn about how the medical use and legal status of cannabis has transformed over the years. Our business meeting is scheduled for Tuesday, July 16 from 7:00 to 8:00 am. Please consider attending to welcome our newly elected officers, including Megan Undeberg, who will be installed as Chair-Elect. We will also be discussing future plans for the SIG – please come and share your ideas. There is also a special opportunity I want to make everyone aware of – The 44<sup>th</sup> International Congress for the History of Pharmacy will be held in United States (Washington, DC) this summer (September 5<sup>th</sup> to 8<sup>th</sup>). Historians and pharmacists from around the globe will gather at to discuss and explore pharmacy’s fascinating past. This Congress, co-sponsored by the American Institute of the History of Pharmacy (AIHP), will address two inter-related themes: the history of the work of the pharmacist and the profession’s effort to provide medicines of good quality. For more information, and to register, go to <https://aihp.org/registration-open-ichp/>

Sincerely,

**-Michael Hegener, SIG Chair**



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### **EXCITING OPPORTUNITIES—MARK YOUR CALENDAR**

Monday, July 15th; 11AM-12noon

At the AACP Meeting in Chicago

“Evolution and Application of US Marijuana Laws to Pharmacists in Medical Cannabis Dispensing Roles” Please see the AACP website for more details: <https://www.aacp.org/article/pharmacy-education-2019-programming>

September 5-8th, 2019.

International Congress for the History of Pharmacy, Washington, DC.

Four days of activities, tours and sessions. The American Institute for the History of Pharmacy is hosting. Please see the website for additional details: <http://www.44ichp.org>

## Meet the Editors

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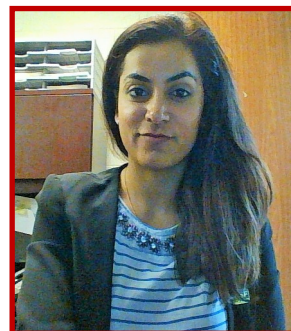
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## Message from the Editor

Welcome

Welcome to the seventh edition of the History of Pharmacy SIG Newsletter in the six years since it's inception. This is the third edition containing peer reviewed manuscripts! We

are especially proud to welcome and publish submissions from students!

Yes, history is alive and well! To continue keeping history alive and well, we need your submissions. We welcome writers, reviewers and con-

tributors to the newsletter I'm looking forward to seeing everyone in Chicago this summer! and we welcome volunteers to help with editing and formatting the newsletter.

Please reach out to me or the Chair of the HOP SIG to volunteer.

—**Cathy Taglieri,**  
**PharmD, MCPHS Uni-**  
**versity, School of Phar-**  
**macy**

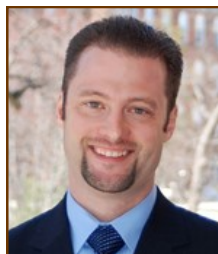
## SIG OFFICERS



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Management

## ANNOUNCEMENTS

### HISTORICAL TAPES AVAILABLE

Professor Emeritus Mickey Smith, author of the book, *Pharmacy and Medicine on the Air* is looking for a new home for several cassette recordings featuring pharmacists from a by-gone era. Mickey has about 20 tapes available including Fibber McGee & Molly (Kremer's Drug Store), Great Gildersleeve (Richard Peavey, R.Ph.) and Phil Harris / Alice Faye Show (Rexall Family Druggist and the Rexall Company). Also available is a special collection, *Reflections of Pharmacy on the Air*, which contains excerpts from these and other shows prepared for AIHP many years ago. The tapes are available free of charge to any interested party willing to provide a good home to them. Please call Mickey Smith at 1-662-234-5335. No emails please.



### NEW EXHIBIT SPACE AT THE HISTORY OF PHARMACY MUSEUM AT THE UNIVERSITY OF ARIZONA

The History of Pharmacy Museum at the University of Arizona is pleased to announce its current initiative to create a new, 2,100 square-foot exhibit space. Thanks to generous support from UA College of Pharmacy alumnus R. Ken Coit, the new space will be part of a larger expansion project that involves adding a new wing to the existing Skaggs Pharmaceutical Sciences Center. A fly-through, 3D mock-up of the new museum space can be found [here](#).

The goal of the space will be to showcase some of the museum's greatest assets, such as the collection from the Upjohn Pharmacy in Disneyland. Additionally, visitors will be able to interact with video kiosks that present topics related to the present and future of pharmacy.

The museum welcomes ideas and insights from the community. [This video](#) outlines some of the existing ideas, but additional feedback can be sent to [stephen-hall@pharmacy.arizona.edu](mailto:stephen-hall@pharmacy.arizona.edu). Estimated completion date for the project is mid-2020.



### AIHP TO HOST INTERNATIONAL PHARMACY HISTORY CONGRESS

#### EARLY REGISTRATION EXTENDED FOR INTERNATIONAL CONGRESS



WASHINGTON, DC • 5-8 SEPTEMBER 2019

INTERNATIONAL CONGRESS  
FOR THE HISTORY OF PHARMACY

The American Institute of the History of Pharmacy cordially invites members of the AACP History of Pharmacy Special Interest Group to attend the 44th International Congress of the History of Pharmacy, in Washington, DC (at the Capital Hilton), from September 5-8, 2019. Early registration for the Congress, at reduced rates, has been extended to June 15, 2019. This year's Congress is notable in that it is the first to be held in the United States since 1983. The theme of the four-day meeting is "The Pharmacist and Quality Medicines," and a full program of speakers and panels will explore a range of topics related to this theme, including:

An international panel of experts will address "The Past, Present, and Future of Pharmacopoeias" and discuss the issue of quality medicines in historical context.

The keynote speaker, William B. McAllister, PhD, a noted historian at the U.S. State Department, is expected to address the historical development of the international drug control regime.

One of our plenary speakers, renowned medical historian Jacalyn Duffin, MD, PhD, will deliver a lecture on her research on the discovery of the blockbuster drug sirolimus (Rapamycin).

Former AIHP Executive Director Gregory Higby, PhD, will deliver a lecture entitled "Five Hundred Days that Shaped the Future of Pharmacy in the United States, 1820-21."

The Congress' program will also include presentation of more than 50 papers – by authors from 21 countries – on a myriad of topics related to the history of pharmacy and pharmaceuticals.

Go to the Congress website (<http://www.44ichp.org>) for more information about the Congress, including a full schedule and registration information. Or, email AIHP at [aihp@aihp.org](mailto:aihp@aihp.org).



# The First Pharmacy History APPE Rotation at Colonial Williamsburg

When first I thought about pursuing pharmacy, I knew diverse opportunities would come along. However, I never considered history might be one of them. I was surprised to find traces of pharmacy history in the curriculum, and further intrigued by the newly formed Alpha Chapter of the American Institute of the History of Pharmacy Student Association (“AIHPSA”) at my College. My appreciation for pharmacy history grew through the chapter’s activities. It was while so engaged that I became aware of the Advanced Pharmacy Practice Experience (“APPE”) elective at Colonial Williamsburg in Virginia.

It was my pleasure to be the first pharmacy student ever to experience the APPE rotation at the Pasteur and Galt Apothecary in Colonial Williamsburg during the summer of 2018. The goals of the rotation were to assist the student to describe: the work of a colonial apothecary, the development of medicines during the colonial period, compounding with period equipment during the 18<sup>th</sup> Century (C.), and how 18<sup>th</sup> C. pharmacy relates to contemporary practice. Achieving each of these goals was useful, and it surprised me to find many similarities between colonial and modern pharmacy practice. The true value of this experience was not in its structure or goals however, but rather, in its flexibility to personalize to the student’s interests.

The Pasteur and Galt Apothecary is in a unique historical period, when medical enlightenment was just starting. It lies past the time of Galen, but not yet in the era of germ theory. It is a time when many of the true causes of disease were unknown, but evidence-based medical recommendations were beginning to emerge. Plants, animals, and minerals were all medicinal sources. For contemporary learning, this period creates the perfect backdrop, since it allows a student the opportunity to learn their 18<sup>th</sup> C. counterparts, and to apply that knowledge to contemporary methods.

The opportunities available at the Pasteur and Galt Apothecary vary on several levels. When guests, of various backgrounds and verbal proficiency levels, enter the site, they see interpreters in costume explaining what the shop was, who frequented it, and most importantly, the “drugs” used at the time. Communication is key and permeates the entire rotation experience. In addition, the apothecary histo-

rians are at the forefront of 18<sup>th</sup> C. medicine historical research. Accordingly, the rotation offers a unique opportunity to delve into 18<sup>th</sup> C. primary literature, and to discover the dynamics, beliefs and opinions of period authors.

This rotation will never be the same for any two students, and this is what makes it valuable. I chose to focus on public speaking skills, given the varied interactions with the public; 18<sup>th</sup> C. compounding, given my previous hospital compounding experiences; and 18<sup>th</sup> C. contagion, given my interest in infectious diseases. Other options available included the history of pharmaceutical law, 18<sup>th</sup> C. pain management (opium was available but was very expensive), or research regarding 18<sup>th</sup> C. specialties like psychology (Colonial Williamsburg had the first mental health hospital in the country). It is of great value to future students and the profession to be able to use our history to guide our future paths and produce well-rounded professionals.

I want to extend my gratitude to those who made this unique elective APPE rotation available. Professor Emeritus Robert Buerki from Ohio State University College of Pharmacy, who established this APPE rotation. Professor David Baker from WNEU College of Pharmacy & Health Sciences, who initiated the contact with Colonial Williamsburg, and advertised the APPE’s availability. Finally, historian re-enactors Robin Kipps and Sharon Cotner, who work in the Pasteur and Galt Apothecary, and are exceptional preceptors.

*—Edwin B. Kaczinski,  
Pharm.D. Candidate 2019  
Western New England Uni-  
versity College of Pharmacy  
& Health Sciences*



## Using Pharmacy Collectibles in Teaching

I have an office full of pharmacy collectibles and I use them to foster an appreciation and sense of pride in my students. At the start of each lecture I have the class stand up and then I ask a series of questions related to current events and historical facts. When a student doesn't know the answer to a question they sit down. The last person standing wins a pharmacy collectible (by watching eBay I'm able to find interesting things for around \$5.00). If a student is a winner, hopefully this is an item that piques their interest in the profession. It is also educational because students learn from the questions asked.

Like many pharmacists, my first collectibles were mortars and pestles but that rapidly evolved to almost anything of a historical nature that was pharmacy-related. I have items that are rare and unique and some that are common. With collectibles, beauty is unto the beholder.

My wife is a nurse practitioner so the natural gifts between the two of us have been profession-related figurines. The picture (to the right) is of a Capodimonte

pharmacist and is my favorite. I'm not sure when it was made but I don't think it is an antique. As many years as I've been collecting figurines this is the only one like this that I've seen. I have several Capodimontes that are among my favorites. There are multiple companies in Spain that manufacture Capodimontes and they produce products of varying quality. There is no regulatory authority over who uses the name Capodimonte or how they produce their products but generally these are figurines of a high quality that have exquisite detail. They typically cost from a couple of hundred dollars to over \$1,000 for something that is rare.

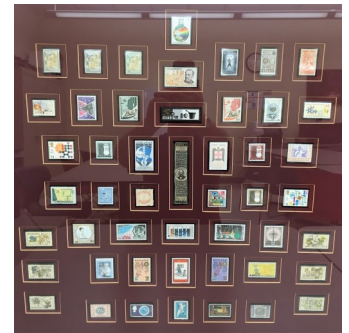
Other than for rare Capodimontes you can find most figurines available on

the Internet, with eBay being the best source for retired items. Some of the more common manufacturers include Lladro, Tom Clark, Anri (carved from wood), Bencini, Romer, Lefton, Forchino, and Goebel. Even though I've collected for many years, I constantly see figurines that are new to me.

Older figurines were made from porcelain, ceramic, or carved from wood and were produced in limited numbers. Most newer ones are cold-cast resins and are made by the thousands. The older ones are typically based on traditional practice while newer ones are often more whimsical. Minority and female figurines are becoming more common.

Pharmacy stamps are an inexpensive collectible item,

such as: revenue stamps (1800s to early 1900s); postage stamps from around the world (see image below); and first day covers (FDCs). Cups and glasses with pharmacy logos and themes are also readily available. (image at bottom of page)



Collectibles are a good way to connect with students and make great conversation pieces. Use of collectibles can be an inexpensive method of introducing students to pharmacy and promoting pride and professionalism.

**—Tony Dasher, PharmD.,  
Assistant Professor, Experiential IPPE Coordinator,  
University of the Incarnate Word**



# A DOSE OF THE DEAD: THE USE OF MUMMIES AS MEDICINE

By Mallory Kara  
and Michael Hegener

The use of human remains medicinally was a phenomena practiced amongst many different cultures. In ancient Egypt, mummies were revered as a very powerful source of healing. Some Egyptians believed that the spirits that lied within the deceased would heal the patient, while others believed a compound called bitumen, used in the embalming process, provided the healing properties.<sup>1</sup> Bitumen is an organic by-product of decomposed plants, similar to petroleum. Different types of bitumen could be found in areas surrounding the Dead Sea: “Limus” from a lake located in Judaea, “Terra” from Sidon, and “Liquidum” from Babylonia. Many raided tombs to acquire bitumen from mummified remains as it was difficult to locate naturally.<sup>2</sup>

The practice of using human remains eventually spread into other nations including Greece, Italy, Europe, and even the early United States in Puritan New England.<sup>1,3</sup> The works of scientists such as Pedanius Dioscorides (40 AD-90 AD), Avicenna (980-1037), and Ibn al-Baitar (1197-1248) influenced the expansion of this practice.<sup>2</sup> In popular culture, the practice was referenced by Shakespeare in his work *Titus Adronicus*, set in Rome.<sup>4</sup>

*“Hark, villains, I will grind your bones to dust  
And with your blood and it I’ll make a paste,*

*And of the paste a coffin I will rear  
And make two pasties of your shameful heads.”*

Edward Taylor (1642-1729), a pastor, poet, and physician, created a dispensatory in Puritan New England, which included various forms of “mummia.” Since colonists were geographically unable to obtain genuine mummified remains from Egypt, the bodies of deceased colonists were utilized. Taylor detailed standards to be met in order to use human remains medicinally, including the physical appearance of the person, the method in which the person was killed, and what was done to the body after death.<sup>3</sup>

There were various medical conditions for which Taylor prescribed human remains. Some were his own beliefs and others were from Johann Schroeder’s 1656 book *Pharmacopeia Medico-Chymica*. Johann Schroeder was a German physicist and medical researcher, best known for isolating arsenic. Schroeder provided several medicinal uses for human remains and had his own “recipe” for preparing the remains, which included utilizing the cadaver of a red-headed man aged about 24 who had been executed, cutting the flesh in pieces and sprinkling it with myrrh and aloe.<sup>5</sup> Taylor’s use of human remains medicinally included application of deceased flesh around a

women’s torso during complicated child birth to help the birthing process, ingestion of ground up human skull to help treat “head diseases and the falling sickness”, and ingestion of dried heart to treat epilepsy.<sup>3</sup>

Throughout the years of this practice, its efficacy was constantly being questioned by opposing practitioners. Michel De Montaigne (1533-1592), Ambroise Paré (1510-1590), and Leohnard Fuchs (1501-1566) are a few antagonists from the sixteenth century that spoke out against using the dead medicinally.<sup>6-9</sup> With the scientific advancements that were made in the nineteenth century, the practice of utilizing human remains medicinally diminished, however some human-based medical therapy continues to this day, including blood transfusions and organ transplantation.

**—Mallory Kara, PharmD Candidate and Michael Hegener, Pharm.D., Associate Professor of Pharmacy. The James L. Winkle College of Pharmacy, University of Cincinnati**

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## A DOSE OF THE DEAD: THE USE OF MUMMIES AS MEDICINE

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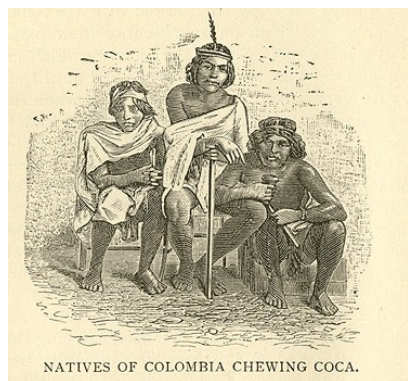
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## HAVE WE FORGOTTEN “THE BIG C” ?

By Susan Smith & Angela  
Pegram

Cocaine is one of the 19 naturally occurring alkaloids from the *Erythroxylum coca* plant which grows naturally in the Andean region of South America.<sup>1,2,3</sup> The first recorded use of the coca plant is by the Ancient Incas who chewed the coca leaves for altitude sickness.<sup>1</sup> After the Spanish



invasion, coca use skyrocketed when it was realized that silver mine laborers had increased physical stamina and decreased appetite if coca leaves were chewed during work.<sup>1,4</sup> In the mid-1800s, cocaine was isolated from coca leaves in Europe and the anesthetic properties of cocaine were soon discovered.<sup>2,4</sup> Cocaine was originally viewed as a “wonder drug” and cure-all agent by physicians in Europe and the US.<sup>2</sup> It was touted to be beneficial for many ailments including hay fever, toothaches,<sup>1</sup> increasing alertness and efficiency,<sup>2</sup> and a marvelous cure for opiate addiction by American and European physicians, including Sigmund Freud.<sup>2,5</sup> Cocaine was readily available in a potent calming beverage as coca wine or vin mariani (endorsed by roy-

alty and Pope Leo XIII).<sup>1,4,5</sup> Coca-Cola was developed in the US (originally containing 9 grams of cocaine per glass), as a “brain tonic” to cure headaches and nervous afflictions. This more economic version of cocaine in a glass offered the same virtues of coca wine without the alcohol.<sup>4</sup> In the late 1800’s, cocaine and opium were combined into the “Brompton cocktail” which was reported in an 1896 manuscript by Herbert Snow to relieve the pain of advanced cancer (morphine) and provide “sustaining vitality” (cocaine).<sup>6</sup> This miracle panacea for terminal cancer pain was promoted readily by hospice care in the US and Europe over the next 75 years.<sup>7</sup> Thus, the combined use of opiates and cocaine was born, leading to epidemic use of both substances into the 21<sup>st</sup> century.

As cocaine’s popularity grew, so did the misuse and abuse of the drug due to its habit-forming soothing properties during the time alcohol prohibition was in force. The 1914 Harrison Narcotic Act, designed to regulate the sale and distribution of narcotics (primarily opiates and cocaine) prevented the sale of cocaine without a prescription. This law required patients to see physicians to obtain opiates or cocaine which created a racial disparity in legal use of these drugs in the late 19<sup>th</sup> century. The Southern white aristocrats were given opiates by their physician to “drown their sorrows”, creating widespread medical-induced opiate addiction. The black population

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## The Forgotten World of Pharmacy in Victorian England

By Andy-kam Lam and Victoria Miller

Imagine living in England during the 19th century and having to purchase a cough syrup prescription for an infant. The prescription consisted of a concoction of opiates, chloroform, and cannabis, which was normal for that time period.<sup>1,2</sup> This is just one example for how markedly different the profession of pharmacy was during the Victorian era in England from 1837-1901.

**Education:** Prior to the start of the Victorian era, the Parliament passed the Apothecaries Act of 1815 to introduce compulsory apprenticeship of apothecaries and to help regulate the profession.<sup>3</sup> The pharmacists were called masters, chemists, or druggists, and the students were called apprentices or assistants.<sup>2</sup> The apprentice or the family of the apprentice would often pay the apothecary to teach them the tools of the trade, and this apprenticeship could last for up to seven or eight years.<sup>3</sup> It was not until the middle of this time period that pharmacists were required to take an examination proving competence and knowledge. Each exam had a practical section for making pharmacy products, a written section regarding chemistry and physics, and an oral section for naming herbs in Latin. The major guild for the profession was the Worshipful Society of Apothecaries of London, and the society was able to conduct examinations and grant licenses to practice medicine.<sup>4</sup>

**Victorian Beliefs:** Before modern biology, there were traditional beliefs that influenced the practice of medicine. Hippocrates developed the concept of the four humors (blood, yellow bile, black bile, and phlegm), and many people during the Victorian era believed these humors could be the cause for health or sickness.<sup>5</sup> For example, if one had a headache, the remedy was bloodletting using leeches provided by the pharmacy and applied by a physician. This was considered much less invasive than draining blood by cutting the skull. Another belief was that the body needed to be cleansed of impurities. The “Everlasting Pill” was sold for that purpose, and it received its name because it could be reused.<sup>2</sup> The pill was a little metal pellet of antimony and was the size of a modern-day marble. The pill was taken orally and some of the antimony was absorbed in the gut causing nausea and diarrhea. The pill eventually passed through the body and was washed and reused by the patient or a family member. The use of antimony was often sought to help treat skin disease, syphilis, or as a cough expectorant.<sup>6</sup>

**Diseases and Medicinal Remedies:** Some of the severe diseases that plagued the country during the Victorian era were cholera, tuberculosis, scarlet fever, and influenza.<sup>2,7</sup> Knowledge regarding bacteria and viruses was lacking, and the concepts

of water or airborne infections was not generally accepted.<sup>7</sup> Typically, only the upper class had the resources to see a physician. This meant that many people often visited the pharmacy to self-treat their condition or to be examined by an apothecary. Most medicinal remedies were in the form of herbals.<sup>2</sup> For example, willow bark or leaves were made into a tea for analgesic use. A pharmacist had to possess general knowledge about herbals, such as the look, smell, texture, and location where the herbs grew. Other medicinal remedies were contained in the *British Pharmacopeia*, which was first published in 1864 with future editions in the Victorian era occurring in 1867, 1885, and 1898. The *British Pharmacopeia* was developed with the intention of consolidating three different pharmacopeias that were previously published in London, Edinburgh, and Dublin.<sup>8</sup> Even with these resources, the use of actual medications during this era was relatively low. Alternative therapies were often used, such as water cures, mesmerism, and electric therapy.<sup>7</sup>

**Pharmacy Business:** On the business side of pharmacy, the pharmacist had to sell whatever they could to keep their doors open.<sup>2</sup> Pharmacists had the freedom of creativity with fewer regulations, and business would grow, through verbal reputation. From the outside of the

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## HAVE WE FORGOTTEN “THE BIG C”

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generally lacked access to medical care due to lack of money, but were introduced to cocaine use in the late 1880's (either on their own or by their foreman) to endure long spells of loading and unloading goods (including cocaine) from steamboats in New Orleans ports.<sup>9</sup> Although cocaine use may have been associated with crime waves and other social outbursts in the 1920's, the use of cocaine declined during the next 10 years, with amphetamines becoming the popular drug of choice in the 1930's.<sup>4</sup>

Cocaine is extracted from the coca plant with a solvent and treated with hydrochloric acid to form cocaine hydrochloride salt, the common powder form that is exported from South



Cocaine Powder

America. This powder is well absorbed through nasal mucosa (“snorting”) or dissolved in water and injected. The powder form must be converted to an alkaline form to be smoked (freebase or crack cocaine) due to decomposition when burning and a high melting point.<sup>4</sup>

No matter the method of entry into the body, cocaine has profound central nervous system (CNS) and cardiovascular toxicity.<sup>1,4</sup> In the CNS, cocaine blocks the reuptake of

dopamine, norepinephrine, and serotonin. Serotonergic effects include addiction and reward effects of cocaine and possible seizures. The excess dopamine activity causes euphoria, increased self-confidence and alertness at lower doses and aggressiveness and hallucinations at higher doses. In the cardiac tissue, cocaine acts as a Type I antiarrhythmic drug on the sodium channels, resulting in ventricular arrhythmias, wide QRS complexes, and QT prolongation.<sup>1,4</sup> Additionally, cocaine causes vasoconstriction which may lead to hypertension, cerebral vascular accident (CVA), cardiac ischemia, and other tissue infarction (extremities, kidneys, gut, and spinal cord).<sup>10-11</sup>

The U.S. Department of Health and Human Services and the Centers for Disease Control and Prevention routinely conduct national surveillance reports on substance abuse and related health consequences. Over 40 years ago, the National Institute on Drug Abuse (NIDA) reported a more than 4-fold increase in the rate of cocaine-related deaths (from 4.5% to 19.1%) between 1976 and 1981.<sup>11</sup> In 1980, 64% of all cocaine-related emergencies were reported in combination with use of other substances, including alcohol.<sup>11</sup> A 1982 report noted that cocaine was often found to be adulterated with various substances such as mannitol, lactose, amphetamines, procaine, or lidocaine.<sup>11</sup> In the ensuing years, rates of cocaine use and cocaine-related overdose deaths varied. During the 1990's, the prevalence of having ever used cocaine continued to



Crack cocaine

increase, from 5.9% to 9.4% (1991 to 2001).<sup>12</sup> Between 2000 and 2006, cocaine-related overdose deaths increased significantly from 1.26 to 2.50 per 100,000 population.<sup>13</sup> The years between 2006 to 2010 saw a decline in the cocaine-related overdose death rate to 1.35 per 100,000 population, most of which did not involve opioids. In 2015, the death rate increased to 2.13 per 100,000 population which appears to be driven by opioid use, particularly heroin and synthetic opioids.<sup>13</sup> The most recent examination of deaths from all drug categories during 2015 to 2016 showed a significant rate increase of 52.4% involving cocaine. Again, it is likely that this increase in cocaine-related deaths is driven by opioid use, particularly illicitly manufactured fentanyl.<sup>14</sup>

Fentanyl and its analogs have been substituted for heroin and other opioids and typically marketed to persons seeking opioids.<sup>15</sup> The danger lies when fentanyl is mixed with cocaine and the resulting product is marketed to opioid-naïve persons seeking cocaine. In fact, the source of an opioid overdose outbreak in Connecticut in 2016 was determined to be a white powder that had been advertised as cocaine but was actually fentanyl that contained only a trace amount of cocaine. This substance had been distributed to persons who were likely cocaine users (based on urine toxicology screens) but not concomitant chronic opioid users. The unintended exposure to fentanyl poses risks of severe respiratory depression and death to patients without opioid tolerance.<sup>16</sup> As most of these patients were primarily opioid-naïve, the fentanyl-containing cocaine product resulted in several fatal and nonfatal overdoses.<sup>15</sup>

The opioid overdose crisis deservedly has our attention. Its effects are far-

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# THE ROSE AND ITS THORNS: THE HISTORICAL USE OF TOXINS IN COSMETICS

By Christina M. Di Donato and  
David Baker

## Introduction

Since antiquity, humans have striven to improve appearances by applying cosmetics.<sup>1</sup> The first cosmetics were made of plants or minerals, which were mixed with desired pigment.<sup>1</sup> Social standards of antiquity prized ethereally pale yet glowing skin, ruby-red lips, and doe-like eyes.<sup>1</sup> For centuries, this ideal remained unchanged.

During the 19<sup>th</sup> century, cosmetics developed a slovenly reputation, usually reserved for lowbrow performers and prostitutes.<sup>2</sup> But after World War I, pragmatism and austerity gave way to the raucous, flashy Roaring Twenties. Women shortened their hair and hemlines, much to the outrage of their grandmothers, mothers, and more conservative sisters.<sup>3</sup> Eyebrows, eyelashes, and eyelids were tinted and lined with black kohl, in a nod to the Ancient Egyptians who derived it from their mineral-rich soil. Bright lipstick was a must; any other shade simply would not do. Women applied rouge to their cheeks and knees for a ruddy, lively complexion. Pale skin was still the standard, but not the sickly pallor romanticized during the late 19<sup>th</sup> century.<sup>3</sup>

## The Pure Food and Drug Act of 1906

The Pure Food and Drug Act of 1906, or “Wiley Act,” was passed to prevent misbranding or adulteration of all remedies and branded nostrums.<sup>4</sup> This law did not address cosmetics, but its passing foreshadowed future legislation. Women in particular purchased and consumed these remedies widely, thanks to advertisements in magazines for mail-order medicines and

cosmetics. However, listing ingredients or concentrations was optional. If the label did not state ingredients, then it was difficult to prove adulteration, i.e., the wrongful addition of an unlisted ingredient.

The cosmetic market was similarly flooded with adulterated products. One study performed by Martin Wilbert in 1915 analyzed facial powders, all claiming to contain rice powder. Only six of sixteen samples analyzed contained rice powder.<sup>5</sup> Worse still, many contained poisonous levels of heavy metals. One sample even contained a completely different desiccant: corn starch. Wilbert’s study also analyzed skin-lightening products containing lead, zinc, mercury, and/or bismuth. These products sold well and visibly lightened the complexion, but many consumers later suffered heavy metal poisoning.<sup>5</sup> Wilbert’s study was one of the first to suggest that cosmetics containing mercury were responsible for women who experienced mercury-related psychoses. Mercury and bismuth poisoning is associated with mental disturbances, peeling skin, bleeding gums, and severe tremors. Mercury was used to compress fur into felt for hats.<sup>6</sup> Milliners in areas with successful hatting industries, like Danbury, Connecticut, suffered from the infamous “Danbury Shakes” and “Mad Hatter Syndrome” that resulted from mercury poisoning.<sup>6</sup> Suspicion arose when these symptoms appeared in women who had no part in the hatting industry.

Mascara became popular throughout the 1920s and 1930s. It contained *p*-phenylenediamine

(PPD), which dyes the hair until new growth replaces it. One particular brand, Lash-Lure, gained notoriety after several women who were sensitive to PPD began to lose their eyelashes.<sup>7</sup> In one extreme case, a woman plucked her eyebrows prior to applying Lash-Lure to her eyebrows and eyelashes. The PPD caused total loss of her eyelashes and eyebrows, leaving the skin further exposed to the dye. The remaining broken skin developed an infection with *Staphylococcus aureus*, which spread to her eyes, and resulted in her permanent blindness.<sup>7</sup>

## The Food, Drug, and Cosmetic Act of 1938

Newly-available radioactive materials in the 1920s were added by manufacturers to every item imaginable in order to make them glow in the dark; and many were marketed with alleged health benefits, such as drinking radium-infused water. Many retailers offered cheap cosmetics with radioactive ingredients as well, which became headline news once the deadly effects began to surface in consumers.<sup>8</sup> Even products that contained no radium at all slapped on the moniker in order to increase sales.<sup>8</sup> At the time, radioactive products symbolized purity and radiance. By applying radioactive cosmetics, the complexion would become so radiant and pure that the wearer would actually glow.<sup>8</sup>



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## HAVE WE FORGOTTEN “THE BIG C”

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reaching, and its tentacles have ensnared opioid and non-opioid users alike with devastating consequences. We must, however, continue to be mindful of the evolving problem of cocaine overdose related deaths as evidenced by the recent rise in cocaine-fentanyl related deaths. Cocaine users who are not also chronic opioid users are likely less adept at identification or treatment of opioid overdose. A key strategy for reducing cocaine-related overdose deaths, even among people who primarily use cocaine, is to have naloxone readily available to treat a co-occurring opioid overdose, and for healthcare providers to maintain a high suspicion of co-occurring opioid and cocaine use disorders.<sup>13</sup>

Historically, cocaine use and abuse have been with us for centuries. Recognizing and adapting to the nuanced usage and abuse patterns of cocaine will unfortunately remain a significant health problem and societal challenge for years to come.

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## THE ROSE AND ITS THORNS

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Radium, along with thorium, was soon found everywhere. A French scientist by the name of Alfred Curie (who bore no relation whatsoever to the famed Marie and Pierre Curie) marketed Tho-Radia face powder. This facial powder, made with a mixture of thorium and radium, was said to make the complexion glow. Unfortunately, the re-

sulting skin necrosis and wasting away of the body would not appear until after years of chronic use.<sup>8</sup>

Even more notorious is the story of the Radium Girls, who were young female workers who painted radium onto clock and watch faces. The girls were instructed to shape the brush into a point by licking the bristles. They even took to painting their fingernails and teeth during work breaks for fun to show off their glow-in-the-dark radium paint. Due to con-



stant exposure to the radioactive paint, they lost their nails, fingertips, and jaws. Their employer scrambled to cover up the damage done, and by the time the courts found the company guilty in the 1950s, nearly all of the Radium Girls had died. Their burial spots, most of them in Essex County, New Jersey, still have detectable radiation levels despite being buried underground for over half a century.<sup>8</sup>

During the meteoric rise of nuclear power, manufacturers sought to incorporate radioactive materials into aspects of everyday grooming. X-rays, described as “the light that never was,” mystified scientists who rapidly sought ways to capitalize.<sup>9</sup> One particular use was as a depilatory agent. Some of those treated would subsequently develop burns and skin necrosis.<sup>9</sup>

These cosmetic innovations, made in the early 1900s, led to many chronic illnesses, which resulted in increased government interventions to make cosmetics safer. The Food, Drug, and Cosmetic Act of 1938 was passed to replace the food and drug provisions in the 1906 Pure Food and

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## THE ROSE AND ITS THORNS

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Drug Act, as well as to address the cosmetic issues. The new law addressed cosmetic safety concerns, resulting in the removal of known toxins causing immediate health hazards.<sup>10</sup> Despite this, concerns about cosmetics still persist today.

### The 21<sup>st</sup> Century

The concerns of today's consumers tend to revolve around the desire for transparency in their cosmetics: an exhaustive list of a product's ingredients. They clamor for their beauty products to be "chemical-free," "preservative-free," or "all-natural." Others may ask for "organic" or "ethically-sourced" ingredients. Anyone can access a myriad of magazine articles, videos, and podcasts on the topic of choice. However, scientific context may become oversimplified in an effort to be reader-friendly, as seen in a *Cosmopolitan* article listing American cosmetic ingredients banned in Europe.<sup>11</sup> Difficulties arise when separating fact from fiction, which may lead to fear-mongering.

The argument against heavy metal exposure has now switched to other topical products, like antiperspirants. In contrast to deodorants, which simply cover up unwanted odor, antiperspirants contain aluminum compounds that form insoluble plugs in pores when in contact with sweat. Concerns arose regarding an association between aluminum and the incidence of breast cancer in women. As a result, several studies looked at the potential for aluminum exposure to cause DNA disruption and neoplasms within axillary lymph nodes. While study results have shown potential harm using *in vitro* samples of murine and canine cells,

little research has been done on human cells *in vivo*.<sup>12</sup> No claims can be made about antiperspirants as of yet, but certain organizations in France have already petitioned to reduce the aluminum content in antiperspirants as a preemptive measure.<sup>12</sup>

Heavy metal compounds in sunscreens, such as titanium dioxide and zinc oxide, have also garnered suspicions about their toxicity in sunburnt human skin. Testing sunscreens on intact skin makes sense, given its use for preventing sunburn before it occurs. However, few studies have examined its use to prevent the worsening of already-sunburnt skin. The skin beneath the stratum corneum has a higher water content, which increases absorption of topical drugs and cosmetics. One research study that examined the absorption of titanium dioxide or zinc oxide through either sunburnt or intact porcine skin found the metallic compounds did not penetrate either sample.<sup>13</sup>

Although cosmetics are perceived as luxuries, their contents continue to face public scrutiny, even to the present day. In February 2016, Johnson & Johnson received massive media attention for their best-selling baby powder. Critics claimed that the mega-company covered up data suggesting that prolonged use of baby powder could lead to ovarian cancer.<sup>14</sup> The reason: the use of talc, a mineral used for centuries, once thought completely harmless, may actually be carcinogenic.

Talc, when mined from the earth, contains fibers similar to asbestos, famous for its past use in building insulation and causing mesothelioma.<sup>15</sup> Johnson's Baby Powder was linked to ovarian cancer in women



Tin of Johnson's Baby Powder, circa 1950s.

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who used the powder to absorb moisture from sweat in the groin region. The talc particles allegedly travel via the vaginal and uterine mucosa into the ovary, causing inflammation and tumors. Afflicted women fought for compensation, one lawsuit costing the company \$72 million.<sup>16</sup> The company's sales of baby care products tanked, dropping 14.4% between the first quarter of 2015 and the first quarter of 2016.<sup>17</sup>

As a final disturbing example, hair dyes containing PPD are still in use, though solely as hair dye. In 2011, a woman, with a PPD allergy, experienced severe hair loss and facial edema one week after dyeing her hair. Within two months, she had lost 90% of her hair.<sup>18</sup> Unfortunately, such allergies are not typically reported to manufacturers or the FDA. When news of such adverse reactions do go public, it feeds the public's distrust of cosmetic products, and their manufacturers.

### Conclusion

Cosmetics have been used for thousands of years for a common purpose: artificial augmentation of the outward appearance. Cosmetic purveyors and manufacturers have capitalized on this fact since the beginning of the Industrial Revolution and mass production. Unfortunately, some companies took risks in either the formulation or production of their cosmetics, ultimately at the expense of the consumer. Even with significant regulation and oversight, beauty still occasionally comes with a cost—but the public may no longer blindly accept it.

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# The Forgotten World of Pharmacy in Victorian England

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pharmacy, there were often stocked bottles of secret recipes on display to catch the eye of people walking by on the street. Once inside the store, customers would have a wide variety of items and services to peruse. The store shelves would be covered with colorful, dangerous, or extravagant names of available products (Figure 1).<sup>9</sup> The



Figure 1. Apothecary Jar from the Harvard Medical Library. French porcelain and dated c. 1860s. *Kermes Minerale* (common name: red sulfured antimony)

typical pharmacy had tools like scales, measuring spoons, herbs, and other cooking equipment to accurately measure precise recipes. The pharmacy sold edibles, such as jelly for babies and other medicinal plants.<sup>9</sup> There were typically family portraits and cameras for sale because pharmacies could easily take pictures and develop film since they had all of the chemicals needed for photography. Some pharmacies during the Victorian era could also produce perfumes, beauty products, hair oils, and soaps.<sup>9</sup> There were recipes sold that were touted as being able to cure many ailments or illnesses and would often contain opium, morphine, or cocaine.<sup>10</sup> Along with medications, pharmacies sold medical equipment, such as an electric shock therapy box (Figure 2)<sup>7</sup> or a bronchial kettle (Figure 3)<sup>11</sup>. The shock therapy box was the

early version of a transcutaneous nerve stimulation machine, and the bronchial kettle was used for patients who needed relief from a dry cough. In contrast to the products that were sold to alleviate illness, pharmacies supplied many dangerous products as well (i.e. rat poison, double cyanide gauze, and skin cream with arsenic).<sup>12</sup> There were no legal restrictions on the sale of arsenic until 1851 so pharmacies could buy and sell arsenic to any paying customer. There are reports documenting that arsenic was purchased for abortions, suicide, or to commit murders. It was also used as a coloring agent in numerous products, such as fabrics, children's toys, and books. Due to the easy access of arsenic and other poisonous substances, as well as the numerous uses for these products in everyday life, there were notably high numbers of poisonings during this time period.<sup>11</sup> Another type of product sold in pharmacies were condoms and universal douches. The production of condoms from animal intestines or bladders took several hours. They were fairly expensive and were often washed and reused by customers. The universal douche was mainly used for hygiene but was also sometimes used for female contraception at that time.<sup>13</sup> The large plethora of products available at an apothecary shop provides evidence for the wide range of knowledge that apothecaries were supposed to possess.

In conclusion, a pharmacy in the Vic-



Figure 2 – Electric shock therapy box

torian era started out as being an apothecary shop for chemists who sold their potions, elixirs, and other health remedies to the public. Until more regulations were passed, the apothecaries of this time provided numerous products and services. They often worked long days in the shop and would even provide house calls to help treat illnesses and ailments. The apothecaries were often the most accessible practitioner to the lay people of England, which is a quality that still applies globally to the pharmacy vocation today. There have been numerous changes that have occurred since the Victorian era, and to see how far pharmacy has come gives a great appreciation of the successes and trials of this profession.

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Figure 3 – Bronchial kettle

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## Pharmacy Chronicles



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The upcoming academic year (2019 – 2020) marks the twelfth year since the History of Pharmacy Special Interest Group (SIG) was formalized as an AACP SIG.

As an open academic forum, the SIG strives to facilitate the exchange of ideas and innovation among pharmacy faculty across disciplines; to serve broadly as an accurate information resource for teaching, learning, and scholarship pertaining to the evolution and history of the pharmacy profession; to develop and maintain historical collections of artifacts and school or college museums; and to ensure the lessons, the message, and the legacy of the pharmacy profession is preserved to educate future generations of pharmacy students.

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