

100 Years of Organic Chemistry

A series of paintings
about a few of the personalities who created the science
of organic chemistry

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Creation Myths

Friedrich Wohler is often credited with establishing the science of organic chemistry with his synthesis of urea in 1828.



But his contemporary and countryman, Justus von Liebig, probably deserves just as much credit for establishing the science.

Outsiders



Quite a few important theories were developed by scientists who, for various reasons, were ostracized by the larger community. Many of their ideas, especially those of Charles Gerhardt and Auguste Laurent, laid the groundwork for critical advances in the science, even as the men themselves remained relatively obscure.

Self-Promoter



Kekule was pretty slick and took credit for a lot of stuff.

Meanwhile in Russia...



Vladimir Markovnikov, a chemist and political progressive, was outmaneuvered by the crafty and conservative Aleksandr Zaitsev. Both men would go on to fame as discoverers of significant trends in chemical reactivity and organic chemistry students today still learn “Zaitsev’s Rule” and “Markovnikov’s Rule”.

Chromatography: a Russian Innovation

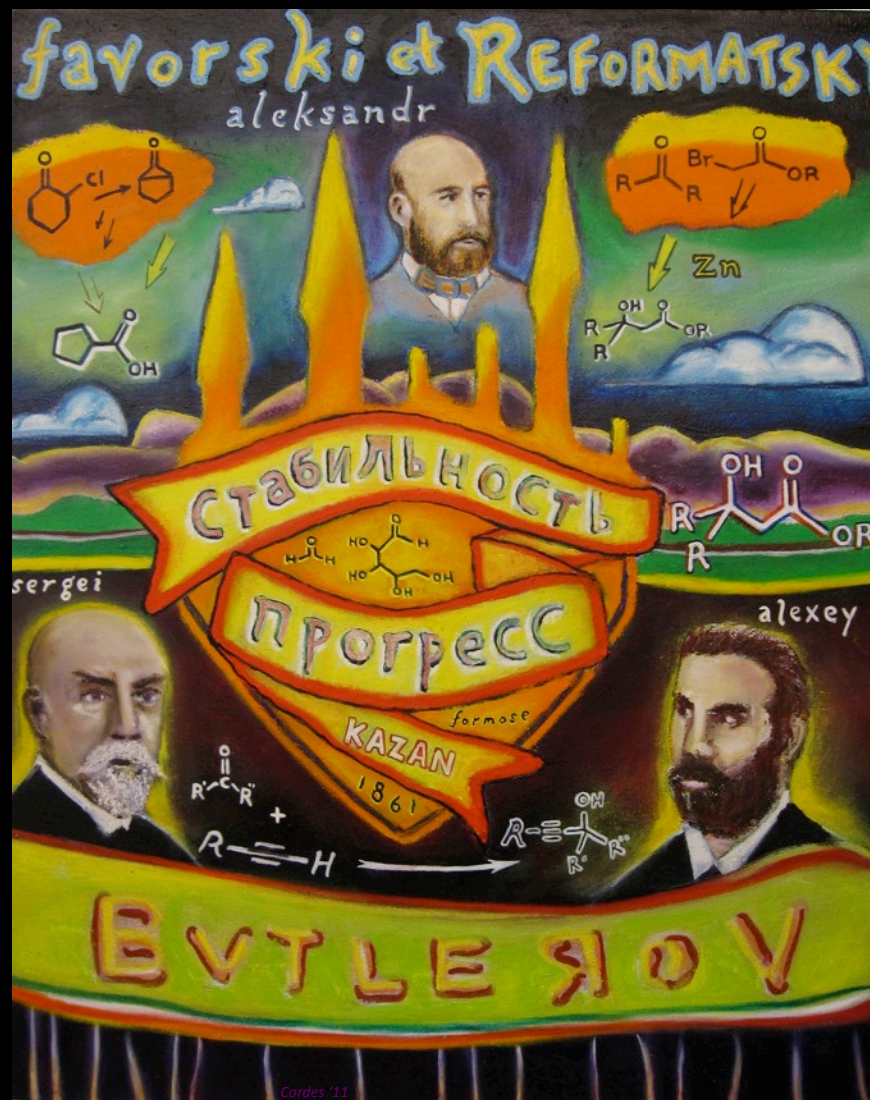
A lot of really excellent chemistry emerged from Russia during the 19th century, but one of the most remarkable and unique innovations came in the form of an important and widely-used purification technology known as “chromatography”.



A young botanist by the name of Mikhail Tsvett developed this separation technique in order to isolate the different components of plant pigments. The man loved plants. Today there are hundreds of variations on his original technique.

Eventually the Soviets Got to It...

...and with their penchant for the dramatic, they developed a mythology around Russian Organic Chemists as the founding fathers of the science.



In this scheme, the truly worthy Aleksandr Butlerov was accorded the highest status, with other notables cast in various heroic and revolutionary roles.

Back in England...

Alexander Williamson made a number of dramatic advances in the science by exploiting the predictive power of the new structural theories that were emerging from continental Europe.



Despite the fact that he only had use of a single arm, Williamson pioneered the rational synthesis of molecules. Students today still learn of the “Williamson Ether Synthesis” in their first semester of organic chemistry.

Chemical Nationalism

Echoing old resentments and presaging a future of gross violence, many European chemists came to see their own chemical researches and intellectual ambitions in the context of emerging nationalist aspirations.



Perhaps no two chemists embodied the practice of chemistry as an exercise in national muscle flexing as much as Adolphe Wurtz of France and the anti-Semitic Friedrich Kolbe of Germany. Both were the sons of churchmen.

Our Hero



August Hofman was an awesome chemist and carried out a number of fruitful researches in industrially important applications. Beloved by his students, he was known as an excellent teacher and promoter of chemistry. As the first Jewish Rector of the University of Berlin, he was almost continually harassed by the ever burgeoning anti-Semitic movement in Germany in the late 19th century.

Not Quite an Organic Chemist...



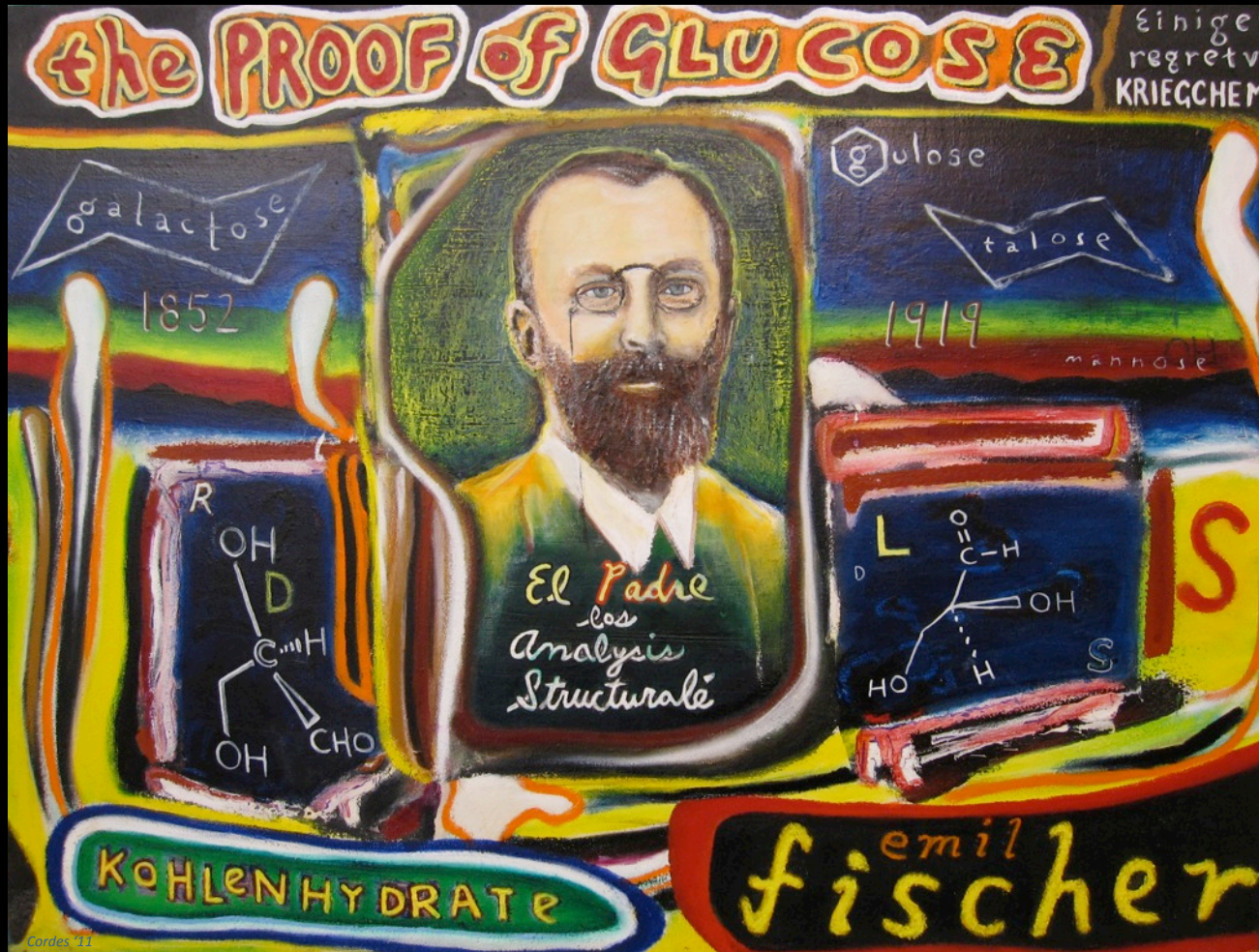
Fritz Haber was also, like Hofmann, a Jew. As in Hofmann's case, converting to Christianity didn't make much of difference to those intent on his torment. Despite his groundbreaking and Nobel Prize-winning work in developing a synthesis of ammonia from nitrogen gas (chemistry that still makes it possible to feed the world), Fritz Haber was driven from his work and homeland by the Nazis. In many ways, these sad destructive patterns were set in motion back in the days of Hofmann and Kolbe.

Pasteur the Chemist



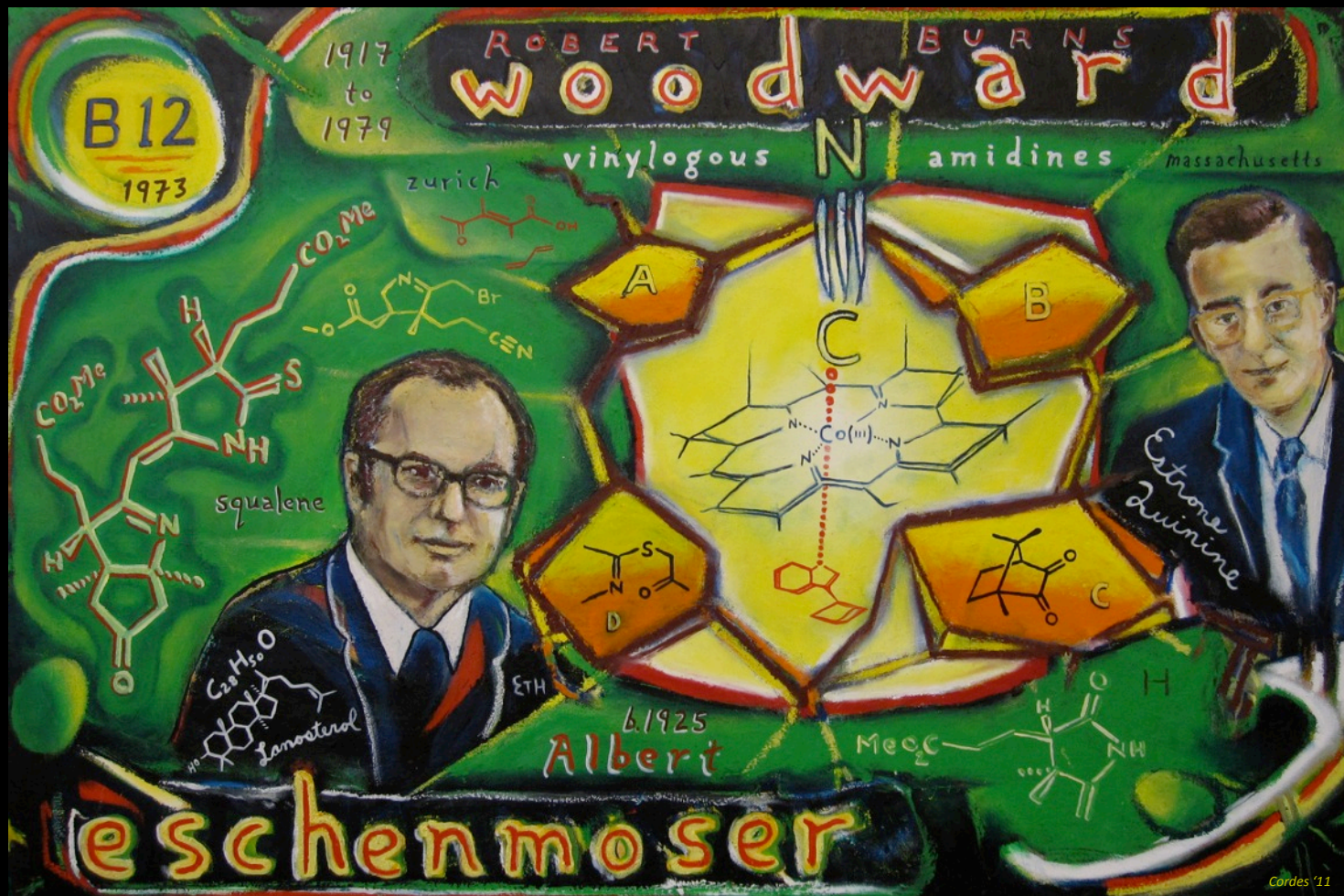
Among his many accomplishments, Louis Pasteur also did some groundbreaking work in organic chemistry, helping to work out some of the details of the three-dimensional structures of organic compounds. Later, Jacob van't Hoff would develop these ideas further, winning the Nobel Prize for his work.

Seduced by a Zeitgeist



Emil Fischer was a genius and did amazing work on one of the the most challenging problems of his day, the determination of the structures of sugars and other carbohydrates. He caught war fever in 1914, though, and became involved in directing chemical production behind Germany's war effort. Sadly, he lost enthusiasm for his task after his son was killed at the front and he himself committed suicide soon after.

We Can Do Anything Now



So, organic chemistry has come a long way from its early days. It might have reached its peak, in a certain sense, around 1972, when Robert Woodward of Harvard and Albert Eschenmoser of the Swiss Institute of Technology synthesized the very complex molecule we know as vitamin B-12. Ever since, it has been widely accepted that organic chemists can make pretty much any molecule that occurs in nature. That is really something!

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