

21st Century Alchemy: Alchemy in the Digital Age

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This article came about from trying to answer what at first appeared to be a remarkably simple question.

“Who are the modern-day alchemists?”

Now this question does have an extremely easy and obvious answer. An answer that would unfortunately have led to this being an extremely short and boring article. That answer of course is mean the Fratres of the Rose and Cross! By that I of course mean the Societas Rosicruciana in Anglia. I therefore propose that we should take that to be the answer to,

“Who are the modern-day philosophical or speculative alchemists?”

That does leave us with the actual operative alchemists, those worthy men of old who laid the foundation for the fields of chemistry, mining, metallurgy, and medicine, to name but a few.

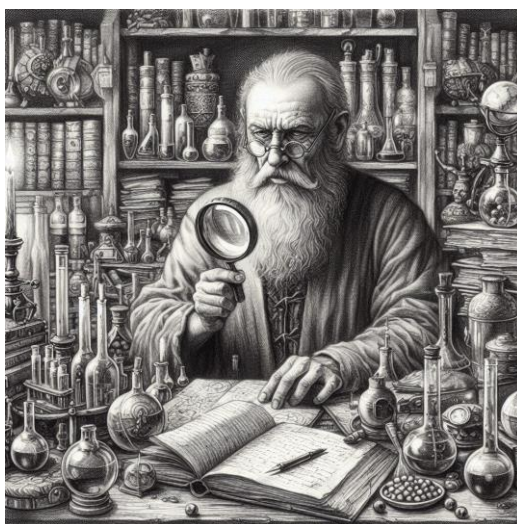
Let us therefore consider the more interesting version of the question.

“Who are the modern-day operative alchemists?”

To discover the answer to this question, and out of general curiosity, I decided to start with a simple survey. I posted the question “Who are the modern-day alchemists?” onto various Social Media platforms, then collated the results. By far the most common ‘sensible’ answer I got was “Chemists.”

This does make a lot of sense if you think about it. Up until the 18th century, alchemy and chemistry were not treated as separate disciplines, but both fell under the general term chymistry, in fact the word chemistry itself derives from the word alchemy. Also, when people think of an alchemist, they tend to picture a mad old man, surrounded by a large collection of strange glass tubes and jars containing unknown liquids and powders which he randomly mixes together into a steaming concoction, his face transfixed with a maddened stare as he attempts to get his desired results. Which to be fair is a surprisingly good description of my old high school Chemistry Teacher.

So, we have one answer: **Chemists!**

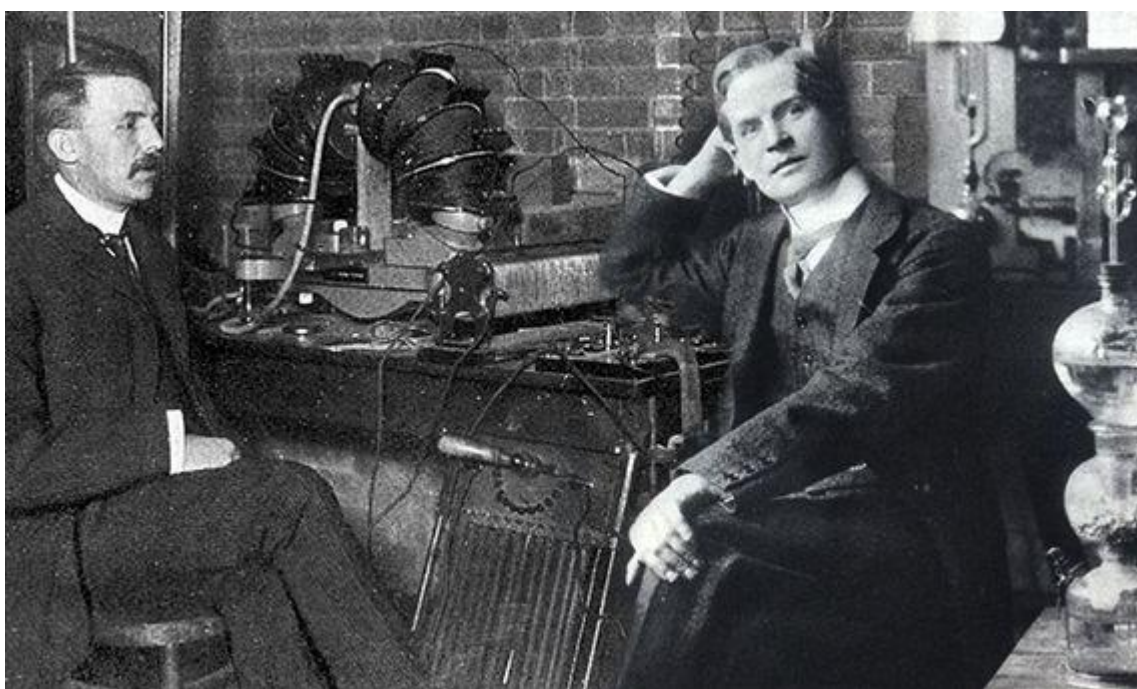


Alchemist or Chemistry teacher.

The two things that alchemists were most known for, was their search for immortality with their quest for the philosopher's stone, and their quest to transform base metals such as lead, into noble metals such as gold. Admittedly this transformation is considered more as a symbolism of spiritual purification and enlightenment, with the physical transformation mirroring the transformation of the alchemist's own soul.

Did the ancient alchemists ever manage to physically transform Lead into Gold? We may never know the answer to that, but with today's knowledge and technology we can perform that transmutation ourselves. We can turn lead into gold.

All you need is a particle accelerator, a vast supply of energy and an extremely low expectation of the amount of gold you will end up with. If you are planning to transmute some gold yourselves, I should point out it was calculated to cost more than one quadrillion dollars per ounce according to Glenn Seaborg in his 1980 paper on the subject.



Frederick Soddy and Ernest Rutherford

In fact, when physicists Frederick Soddy and Ernest Rutherford first witnessed how the element thorium turned into radium through radioactivity. Soddy immediately recognized this as transmutation, but Rutherford was more apprehensive and stated: *"For Christ's sake, Soddy, don't call it transmutation. They'll have our heads off as alchemists."*

We now have another answer: **Physicists!**

The Alchemists of old were a lot more than just chemical mixing wizards in search of immortality and man-made gold. They included such notable individuals as: -

Paracelsus - A Swiss physician and alchemist who made significant contributions to medicine and chemistry.

Sir Isaac Newton - Best known for his work in physics and mathematics, and who gave us the laws of universal gravitation, and motion. Newton also delved deeply into alchemy and wrote many alchemical texts.

Mary the Jewess - One of the earliest known female alchemists, credited with inventing several chemical apparatuses.

Jābir ibn Hayyān - Often considered the father of early chemistry, he wrote extensively on alchemy and is credited with numerous discoveries.

Robert Boyle - A chemist, physicist, and inventor. He is often regarded as the first modern chemist and one of the founders of modern chemistry. Boyle made significant contributions to the scientific method, emphasizing the importance of experimentation and reproducibility.

Jan Baptist van Helmont - A Flemish chemist and physician who made significant contributions to the understanding of gases and chemical reactions.

Elias Ashmole, along with multiple other founding members of the Royal Society were also alchemists.

It has been stated that Alchemists have given us, amongst other things: -

- Amalgamation.
- Ceramics.
- Distillation.
- Dyes.
- Electrolysis.
- Explosives.
- Fermentation.
- Glass Manufacture.
- Gunpowder.
- Ink.
- Leather Tanning.
- Metal plating.
- Poisons.
- Tin Foil,
- Various Laboratory Equipment.

To list just a few.

What If we join all these fields together into the broader term "*Scientists.*" Scientists could be considered as modern-day alchemists in the sense that they work tirelessly to uncover the secrets of the universe and transform our understanding of the natural world. They seek to transmute knowledge and data into groundbreaking discoveries.

So, is the answer to the question: **Scientists!**

Whilst I would agree that several of the modern scientific fields are descended from, or were inspired by the early alchemical practices, I do not believe that the current scientists themselves are the modern equivalents of the alchemists of old.

If we ignore the charlatans and conmen, then the alchemists of old appear to be a remarkably driven group of individuals with a wide range of interests and passions. Their dedication to unravelling the mysteries of nature and the universe was so intense that they often operated in secrecy. To protect themselves, these determined alchemists would frequently hide their true identities and publish their works under assumed names or pseudonyms. This cloak of anonymity was necessary to avoid risking not only their reputations within the scientific community but also to safeguard their freedom and, in some extreme cases, their very lives. Throughout history, there have been numerous periods when alchemy was banned or heavily persecuted, forcing practitioners to work in the shadows, away from the prying eyes of authorities who might imprison or even execute them for their esoteric pursuits. Despite these challenges, alchemists persevered, driven by a relentless curiosity and an unyielding quest for knowledge that transcended the boundaries of their time. Their legacy lives on in the countless contributions they made to the fields of chemistry, medicine, and philosophy, laying the groundwork for many of the scientific advancements we benefit from today.



*An etching depicting the execution of the alchemist, Georg Honauer (1572-1597)
on the specially erected "Iron Gallows" in Stuttgart, April 2nd, 1597.*

So just who are their modern equivalents?

I believe that what truly defines the operative alchemists of old is their unwavering commitment, even in the absence of fame or fortune. Despite the ever-present risks of arrest by authorities or being ridiculed by their peers, these alchemists were driven by an insatiable curiosity and a relentless quest for understanding. Their motivation was not external recognition, but the burning desire to explore and answer the two most profound questions in the universe: 'What if?' and 'How can I?'.

One asks the questions What if I did X, such as: -

- What if... I mixed these chemicals together?
- What if... I heated this element?
- What if... I mixed saltpetre, sulphur, and charcoal?
- What if... I put peanut butter and jelly on the same sandwich?

It is the question that leads to so many new discoveries.

The other question works backwards from the desired result. How Can I do X: -

- How Can I... See much further, even to the heavens?
- How Can I... turn lead into gold?
- How Can I... use this device in a way other than intended?
- How Can I... fly like a bird?

If you think about it, they are both immensely powerful questions, because ignoring accidental discoveries such as Alexander Fleming's discovery of Penicillin, almost every scientific discovery and advancement could have been derived from someone asking one of those two questions.

Before I give you my answer to the question “*Who are the modern-day alchemists?*” I did ask this same question to an AI bot to get its answer. The response was simply a list including Philosophers, Artists, Innovators, Transhumanists and Biohackers. Which I found interesting.

Who do I think are the modern-day alchemists?

Since the early 1960s, a dedicated group of individuals has been guided by the two fundamental questions: “What if?” and “How can I?”. These pioneers, in their relentless pursuit of knowledge and innovation, have often operated in the shadows. To protect their reputations and personal freedoms, they have had to conduct their work covertly, publishing their findings in coded language and under pseudonyms. This clandestine approach was necessary to evade the watchful eyes of authorities who might otherwise suppress their groundbreaking efforts.

Much like the alchemists of old, who carefully guarded their secrets and shared knowledge within exclusive circles, these modern-day seekers have also formed close-knit communities. Within these sanctuaries of shared learning, they exchange expertise, collaborate on projects, and support each other’s endeavours. These communities are reminiscent of the ancient alchemical brotherhoods, fostering an environment where curiosity and innovation flourish. Here, the spirit of collective growth and mutual aid thrives, enabling each member to contribute to the collective advancement of their shared goals and ambitions.

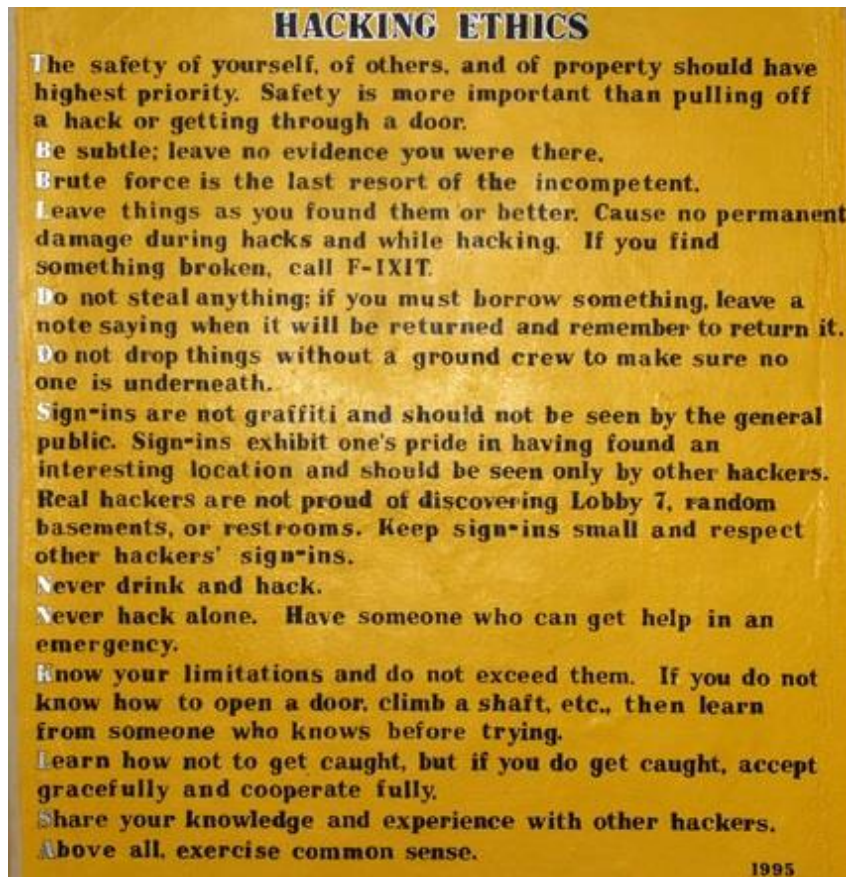
Through these parallels, it becomes evident that the pursuit of hidden knowledge and the drive to answer profound questions are timeless endeavours. Whether in the secluded labs of historical alchemists or the secretive circles of contemporary explorers, the quest for understanding remains a powerful, unifying force.

Who are these people? **Hackers.**

I am, of course, not referring to criminals or the sensationalized use of the term often perpetuated by the media. Instead, I am alluding to the original, more nuanced meaning of the word “hacker.” This term has its roots in the early days of MIT, where it was used colloquially among the brilliant minds and tinkerers at the Massachusetts Institute of Technology. Back then, a “hack” was simply a slang term for a clever or elegant solution to a technical problem, essentially a smart shortcut that showcased ingenuity and deep understanding.

A hacker, in this original context, was someone who employed these clever shortcuts and demonstrated outside-the-box thinking to achieve their objectives. They were innovators and problem-solvers, constantly pushing the boundaries of what was possible with technology. This culture of creativity and intellectual challenge fostered a spirit of exploration and discovery, where individuals took pride in their ability to ingeniously navigate complex problems with resourcefulness and skill.

Far from the negative connotations it later acquired, the term “hacker” initially represented a badge of honour among the tech-savvy community, signifying a person who could think laterally and find novel solutions in the face of intricate technical challenges. This legacy of creative problem-solving continues to influence and inspire the modern tech landscape.



Hacker code of ethics painted on the wall of an MIT basement.

This original (*and correct*) use of the term is slowly making its way back into mainstream use, gaining renewed recognition and appreciation. This revival is largely attributed to the emergence of modern terms such as “Life Hacks,” which refers to clever tips and tricks to simplify everyday tasks, “Biohacking,” where individuals use science and technology to enhance and optimize their own biology, and “Hackathons,” events where programmers collaborate intensively over a short period to create innovative software solutions.

These contemporary applications not only reflect the inventive spirit of hacking but also help to rehabilitate the term, moving it away from its negative connotations and highlighting the positive, creative, and problem-solving aspects that were originally intended. Through this resurgence, the term “hacker” is reclaiming its rightful place in the lexicon as a symbol of ingenuity and out-of-the-box thinking.

Why are hackers the modern-day alchemists?

Just as alchemists sought to uncover the secrets of the natural world and the hidden properties of matter, hackers are driven by an insatiable thirst for knowledge. They delve deeply into the inner workings of software and networks, guided by curiosity and a relentless pursuit of understanding. These modern-day seekers of truth and wisdom, like the alchemists before them, have often been misunderstood, demonized, and even outlawed. However, their contributions have been significant, leading to the invention and advancement of various technologies.

What are some of these technologies?

Consider Telecommunications.

Before the advent of Phone Phreaking, long distance phone calls were both extremely rare and prohibitively expensive due to the complexity and cost involved in connecting calls over large distances. The technology at the time required significant resources and infrastructure to link different phone systems, making such calls a luxury that few could afford. However, a group of ingenious individuals, often referred to as hackers or phone phreaks, began experimenting with the technology. Through their clever manipulation and understanding of the phone system, they discovered ways to link various phone companies' systems together, allowing calls to be made more easily and at a fraction of the cost.

These early hackers didn't stop there. They innovated further by organizing group phone calls, where people from various parts of the world could dial in and converse simultaneously. This was a revolutionary concept, as it enabled real-time, multi-party communication, a feature that was not commercially available at the time. Today, we take such a capability for granted in the form of conference calls, but back then, it was a groundbreaking achievement that opened new possibilities for global communication.

One particularly notable duo in the world of phone phreaking was Steve Wozniak and Steve Jobs, who would later become renowned for founding Apple Inc. Long before they built their first Macintosh computer, Wozniak and Jobs were deeply involved in the phone phreaking scene. They created and sold "blue boxes," devices that could manipulate the phone system to make free long-distance calls. This entrepreneurial venture not only honed their technical skills but also laid the foundation for their future collaboration in revolutionizing personal computing.



Blue Box, Designed and Built by Steve Wozniak and Marketed by Steve Jobs, circa 1972.

How about medical advancements.

A recent report described Biohacking as a do-it-yourself biology movement that aims to enhance health, appearance, performance, overall well-being, and even to slow the natural aging process. This movement is driven by individuals who experiment with their own biology, using a variety of methods and technologies to push the boundaries of human potential. In many ways, this quest mirrors the alchemists' age-old search for the Elixir of Life, a legendary substance believed to grant eternal youth and immortality.

Since 1998, when British scientist Kevin Warwick implanted an RFID chip in his arm to automatically unlock doors and turn lights on in his office, the field of Biohacking has seen tremendous advancements. Warwick's pioneering experiment was just the beginning of a wave of innovative medical technologies. Fast forward to today, and we have Elon Musk's Neuralink brain chip, which aims to connect the human brain directly to computers, potentially revolutionizing the way we interact with technology and treat neurological conditions.

Modern Biohacking has given rise to numerous incredible breakthroughs. We have robotic arms that can be controlled by thought, thanks to brain-computer interfaces. Bionic limbs, ears, and even eyes have become a reality, transforming the lives of individuals with disabilities. If you remember the old TV show "The Bionic Man," we can now legitimately say, *"We can rebuild him. We have the technology. We can make him better than he was. Better, stronger, faster."* This once-fictional concept has leaped off the screen and into our lives, thanks to the relentless pursuit of knowledge and innovation in the field of Biohacking. These advancements not only improve the quality of life for many but also push the boundaries of what it means to be human, echoing the alchemical dream of transcending natural limitations.

Researchers at the Massachusetts Institute of Technology have developed a new colour-changing tattoo ink that responds to changes in the body, such as blood sugar and sodium levels. Using a liquid with biosensors instead of traditional ink, scientists want to turn the surface of the human skin into an "interactive display" - an idea that makes this proof-of-concept an exciting one to watch. Technology like this could become a revolutionary new way to monitor health. For instance, diabetics could get a special tattoo that changes colour to indicate their blood sugar levels, providing a non-invasive and continuous way to monitor their condition.



Kevin Warwick controlling a robot hand via implant in his arm.

In today's world, it's hard to find anyone who doesn't own a smartphone or a computer of some kind. These devices have seamlessly integrated into our daily lives. From banking to healthcare, and from communication to entertainment, nearly every aspect of our existence is influenced and controlled by technology. We rely on websites and apps for an array of tasks, from managing our finances and scheduling medical appointments to staying in touch with loved ones and streaming our favourite shows.

Much of this technology, which we often take for granted, has been invented, improved, or secured by hackers. These individuals, driven by their curiosity and innovative spirit, have played a crucial role in shaping the digital landscape. Hackers have developed the software and hardware that power our devices, created the algorithms that keep our information safe, and pushed the boundaries of what technology can achieve. Their contributions have not only enhanced convenience and connectivity but have also paved the way for groundbreaking advancements in various fields, making our lives more efficient and interconnected than ever before.

And finally, to touch lightly on the spiritual or philosophical aspect of alchemy, I will quote a section from a manifesto that mysteriously appeared all over the world one day without warning. This remarkable event echoed the sudden emergence of the anonymous Rosicrucian manifesto 'Fama Fraternitatis,' which made its debut throughout Germany in 1614. The 'Fama Fraternitatis' captivated minds with its tales of hidden knowledge and the secret society of the Rosicrucian's, promising enlightenment, and wisdom to those who dared to seek it.

*This is our world now... the world of the electron and the switch, the
beauty of the baud.*

We explore... and you call us criminals.

We seek after knowledge... and you call us criminals.

*We exist without skin colour, without nationality, without religious bias...
and you call us criminals.*

*Yes, I am a criminal. My crime is that of curiosity. My crime is that of
judging people by what they say and think, not what they look like.*

You must admit, that is a worthy ideal. To seek after knowledge without any bias by race, religion, or standing.

Therefore, in conclusion, I believe that in this digital age, hackers epitomize a modern-day manifestation of the alchemical spirit. Their remarkable ability to transform digital systems, their insatiable thirst for knowledge, their ethical pursuits, and their intense sense of community all closely parallel the ideals upheld by the ancient alchemists. Though hackers are often portrayed in a negative light, it is crucial to recognize their immense potential to bring about positive change and enlightenment within the digital realm.

Embracing this analogy between hackers and alchemists allows us to see them in a new light, highlighting their significant role in our technologically driven world. It underscores the importance of responsible hacking, which is fundamental to societal progress and the continuous improvement of our digital infrastructure. Just as the alchemists laid the foundational stones for modern chemistry,

hackers are pioneering the future of digital transformation. Their innovative efforts and relentless curiosity position them as the true modern-day alchemists of our time, shaping the digital landscape and driving technological advancements that benefit humanity as a whole.

Recognizing hackers in this context encourages a more nuanced appreciation of their contributions and promotes the responsible and ethical use of their skills. It underscores the vital role they play in safeguarding, enhancing, and revolutionizing our digital age. By doing so, we honour their legacy as the modern bearers of the alchemical tradition, pushing the boundaries of what is possible and opening new frontiers in the world of technology.

Just as alchemy laid the foundation for modern chemistry, hackers are shaping the future of digital transformation, making them true modern-day alchemists in the digital age.



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