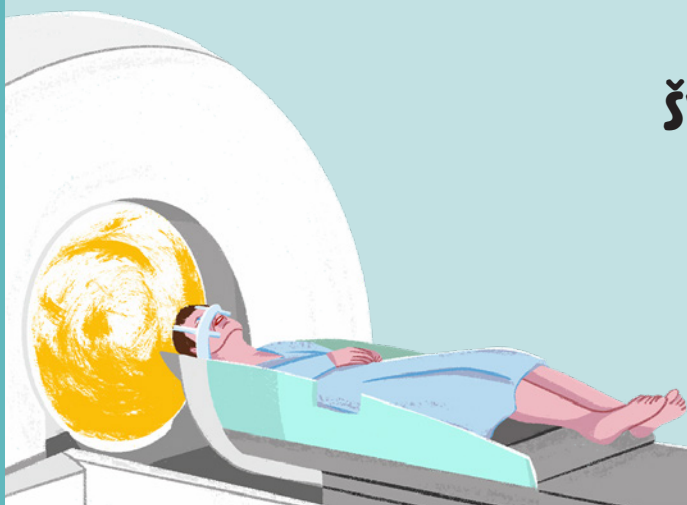


FROM SHAMANS



TO NEUROSURGEONS

ŠTĚPÁNKA SEKANINOVÁ
AND MATEJ ILČÍK

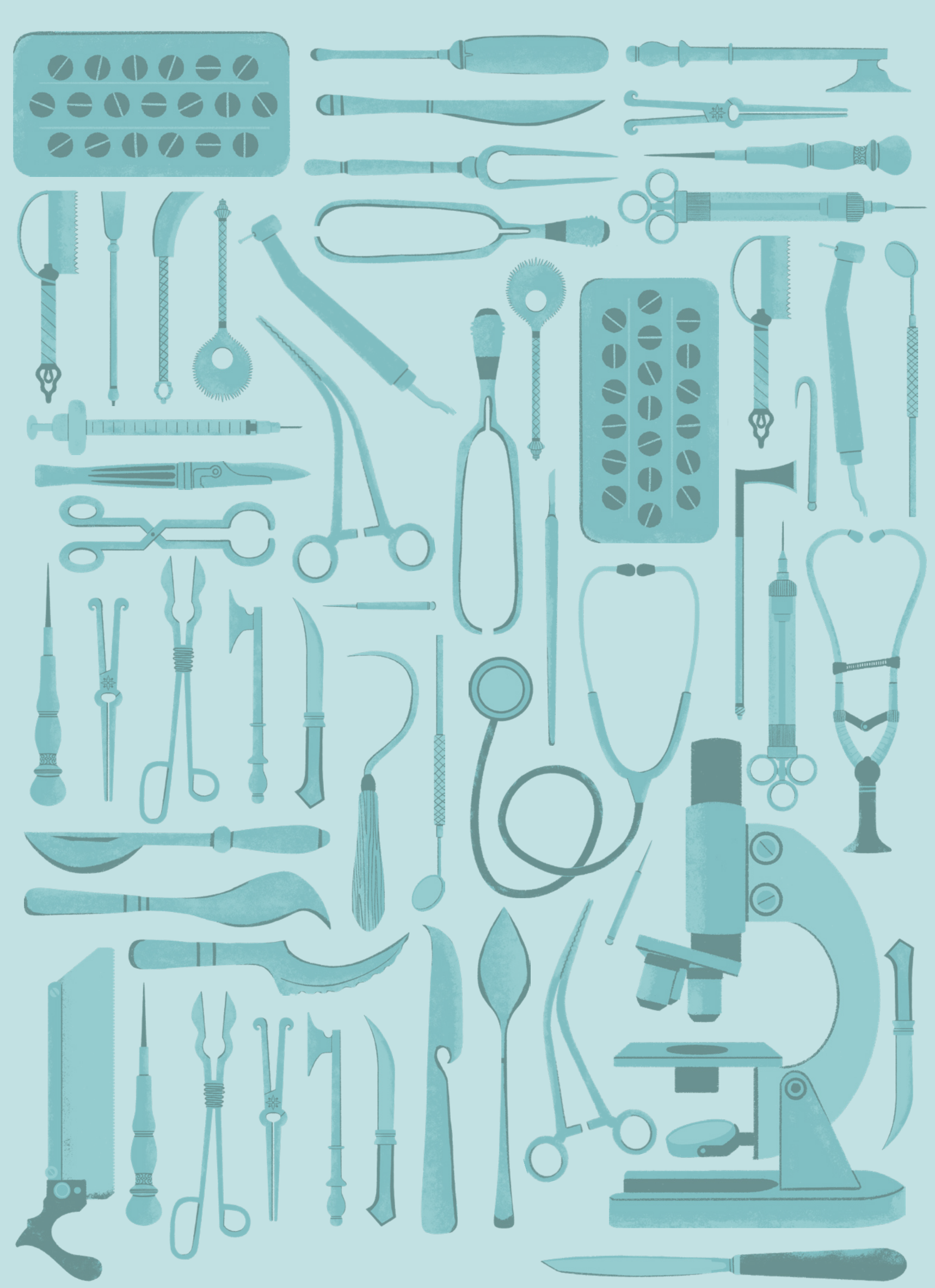


B4U PUBLISHING



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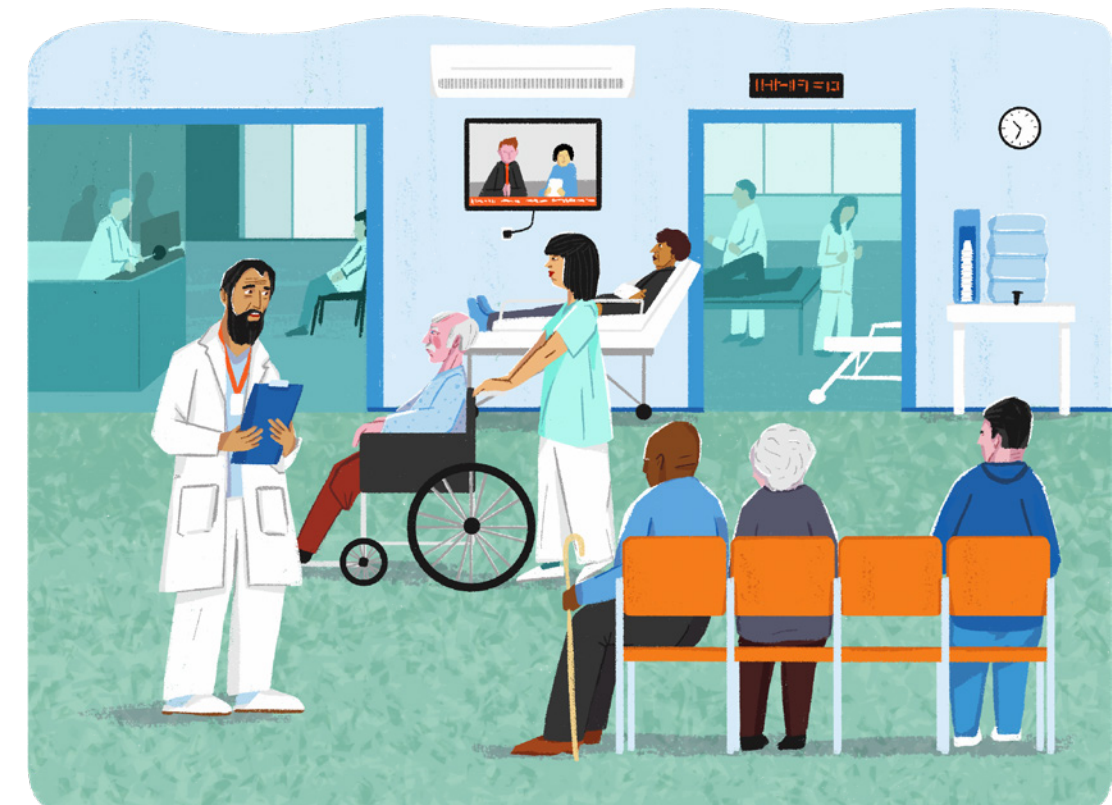




FROM SHAMANS TO NEUROSURGEONS

B4U PUBLISHING

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PREHISTORIC TIMES



Where there are humans, there will be sickness, disease and other ailments. Today, we have specialist doctors to treat these, but in the past ... How did people handle illness in prehistoric times?



← SHAMANS AND OTHERS

The first physicians on Earth were mighty medicine-men known as shamans. They knew so much about herbs and forces of nature that members of their tribe believed them to have magical powers. In those days, everyone was able to treat their own minor wounds and injuries; it was enough to do as the animals did and follow your instincts.

DID YOU KNOW ...

... that prehistoric people were able to mend broken bones? That in case of need they were able to amputate an irrecoverably damaged limb as early as 4,000 BCE? They were also able to sew up gaping lacerations. Perhaps the most feared Stone Age operation was trepanning of the skull.

COMMON SENSE ↑

Our Stone Age ancestors learned a few basic lessons very quickly: catching a chill and eating or drinking too little were causes of illness. So, too, was spending time in the presence of someone sick – you would be full of beans when you entered his room and in a weakened state when you left it. It goes without saying that evil forces were thought to play a role in it. To counter them, shamans made amulets, performed complicated rituals, brewed herbal drinks and did anything else they could think of in the fight against evil spirits and other hostile forces.

AMULETS

The main and most basic protection against deadly disease and painful injury was incantation, plus an amulet from the magical hands of a shaman. Everything bad was blamed on evil and treacherous demons.



← FOREIGN OBJECTS IN THE BODY

Our ancestors soon noticed that an animal with a large, sharp thorn in its paw would try to pull this thorn out. If this was not done, the thorn would become encased, and a festering ulcer would form before eventual rejection of the offending thorn in a burst of pus. They also discovered that a flow of blood should be stanchied, and that painful wounds should be cooled with cold water.

OW, MY TEETH! →

In the Stone Age, there were no kind dentists inviting you to recline before you opened your mouth. Prehistoric people left their teeth to their fate. As a result, they frequently suffered with tooth decay and jaw-damaging gum infections. There is some evidence of dental work: several finds testify to the drilling and filling of teeth. The drill that performed this work was made of stone and turned by a small bow. Ow! Ow! Hurts, doesn't it?



OPEN HEADS

We tend to think that our **Palaeolithic** forebears could barely count to five, poor things. Yet they were able to trepan skulls in a flash!

Trepanning is performed by drilling a hole or cutting a small opening in the head, with the aim of relieving persistent pain. Prehistoric people did this using only a knife of sharpened stone or flint. The amazing thing is, patients would survive this crazy operation!

Maladies whose treatment required trepanning: migraines and other headaches, schizophrenia, epilepsy.



MESOPOTAMIA



"It is no wonder that you are ill, for you have sinned." If you were in ancient Mesopotamia, you would hear these or similar words. This is because the Mesopotamians viewed illness as punishment for bad behaviour. A sick person could be cured by God's will only, in an act of forgiveness.

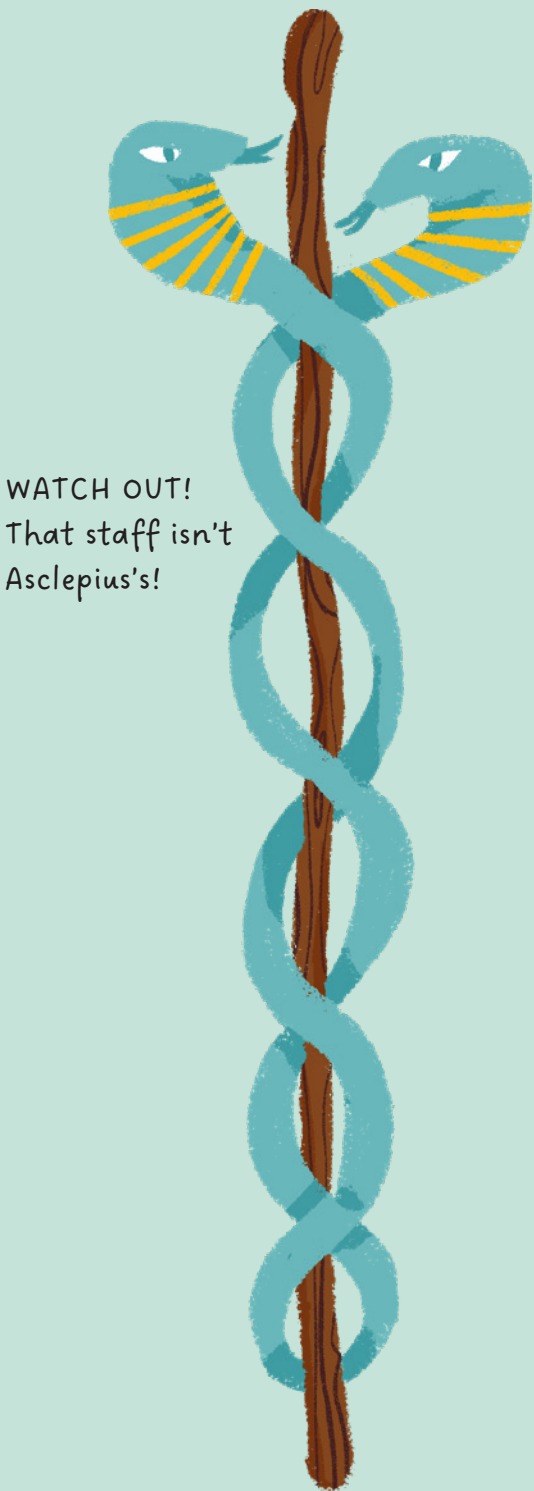


HEALING TRINITY ↑

The first visitor at a sick man's bedside tended to be a soothsayer. He would search the organs of an eviscerated sheep, the stars and the flames for signs telling how the illness would develop, and if the patient would recover or

leave for the Other Side. The soothsayer would be joined at the bedside by a priest performing purifying rituals whose intention was to drive evil spirits and demons from the weakened body. A physician would be called only if none of these acts were seen to help the patient. Only then was it time for medicine, changing of bandages, and minor surgical procedures.

DID YOU KNOW ...



WATCH OUT!
That staff isn't
Asclepius's!

... that Sumerian physicians were educated at medical schools established by individual temples, meaning that they got a priestly education as well as a medical one? Water attributed to the god Ea was considered a very important element in the treatment of a wide range of maladies. For Mesopotamians, the snakes on the staff of the god Ningishzida were a symbol of healing: the regular shedding of their skin equalled constant renewal. A staff with a snake remains a symbol of medicine to this day.

I'M A DOCTOR,
YOU KNOW ↓

Everyone would know a Sumerian physician doctor at a distance of a hundred miles. Unlike his bearded compatriots, he was clean-shaven. He wore close-fitting clothing and carried a bag filled with herbs and medicaments. By so doing, he showed off his education and position of privilege.



Sumerian physician

REWARD OR PUNISHMENT

That's right, ancient Mesopotamian doctors were able to perform minor surgery. We know this from archaeological finds of **scalpels**, medical saws and knives, and skull-o-pening tools. The first **surgeons** received their training in anatomy by performing autopsies on executed criminals. Well, they had to practise on someone, didn't they?

EXAMPLE OF TOOLS
USED BY DOCTORS
IN THE PERIOD
OF THE ANCIENT
MESOPOTAMIA

WATCH OUT!
These are really
sharp blades!



Archaeological finds have proven that Sumerian physicians routinely used tools in their work.

ANCIENT EGYPT



No one will be surprised to learn that the foundations of medicine as a proper science were laid in ancient Egypt, the mighty realm on the banks of the mighty River Nile. The ancient Egyptians were the first to seek understanding of disease and its causes. They were surely helped in this by their enthusiasm for **mummification**, which allowed the thorough exploration of the bodies of chosen ones, inside and out.

mummification – preservation of the body for life after death



WHERE'S YOUR AMULET?

Like the Mesopotamians, the Egyptians believed in supernatural guides for certain illnesses. For failure to perform regular rituals, invoke the gods or wear an amulet, it was feared that the demon of a restless deceased person could enter your body and drain away your life force ... Make sure this does not happen to you, ladies and gentlemen!



NEXT, PLEASE!

"What seems to be the problem?" asked the Egyptian physician. When the patient reached the end of his explanation, the doctor began to examine him. He felt around his wound, took his pulse, inspected his skin, and checked his heartbeat. On the basis of all this, the doctor made a **diagnosis**. Only then did he decide if this was an illness he recognized, and if he would even try to treat it.

EXAMPLE OF TOOLS USED BY DOCTORS IN THE PERIOD OF THE ANCIENT EGYPT



Like their ancient Sumerian counterparts, Egyptian physicians relied on specialist medical instruments.

MALIGNANT DISEASES

In poor areas of towns and cities, dangerous illnesses such as cholera, measles, typhus and smallpox were rampant. Smallpox was a particular scourge: people who recovered from it were marked by its scars for the rest of their lives, and some were left blind. 400,000 Europeans died of smallpox in 1,700 alone.



PREVENTION IS BEST ➔

Qualified medical practitioners of the 18th century were well aware of the importance of prevention – hence their vehement recommendation to eat in moderation, adopt practices of good hygiene, and spend time in the fresh air. Those who lived in dirty city streets should travel to reach the latter. Medics of the time considered travel per se – but especially riding on horseback – to be a health-promoting activity.

DID YOU KNOW THAT IN THE 17TH AND 18TH CENTURIES ...

... barbers operated on kidney stones? Surgical instruments were not washed, so as to save them from rust?

SMALLPOX DEFEATED!

In 1796 the physician **Edward Jenner** discovered a vaccine against smallpox. Having established that people who care for cattle infected with cowpox never came down with smallpox, he experimented on a young boy with a vaccine taken from cowpox blisters. A few months later, he injected the same boy with the smallpox infection – and made the discovery that the patient was resistant to the disease. Man’s successful fight against smallpox had begun!



Richard Lower transfused a sheep’s blood into a man, so performing the first blood transfusion (in 1687)? The first “indestructible, odourless set of teeth” (a porcelain prosthesis) was used (in the 18th century)?



THE TOOTHWORM’S END!

Until the 18th century, physicians and laypeople alike believed that tooth decay was caused by little toothworms. This theory was laid to rest once and for all by French surgeon **Pierre Fauchard**, whose detailed examinations of the teeth and oral anatomy laid the foundations of stomatology as an independent branch of medicine.



Pierre Fauchard
(1678–1761)

ORANGES AND LEMONS

Physician **James Lind** (1716–1794) was determined to crack the mystery of scurvy. He drew on the habits of the sailors themselves, observing that those who took plenty of oranges and lemons on board avoided the disease. Lind then applied his findings on a voyage by treating twelve sailors suffering from the disease. In 1747, he supplemented the regular diet of two of these lads with oranges and lemons and – lo and behold! – they soon recovered. Lind had found that citrus juice was a cure for scurvy without exactly knowing why.

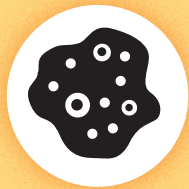


OH NO – SCURVY AGAIN!

Long ocean voyages – which were ever more common from the 15th century on – gave the world a new disease: scurvy. Sailors became malnourished and deficient in vitamin C; as a result, they suffered from bleeding gums, bleeding from the skin and general weakness, and their teeth would fall out. The most serious cases would end in death. Physicians puzzled over the causes for a long time, while treating the condition with herbal remedies.



19TH CENTURY



The nineteenth century was a great time for the medical sciences! Anatomy and diagnostics made enormous progress, vaccination became a widely accepted practice, and faculties of medicine began to specialize in various fields. (If you remember, ancient Egyptian physicians had had specializations many centuries earlier ...) Last but not least, the 19th century saw the elevation of surgery to new heights!

Once considered the domain of barbers, surgery finally established itself in the universities.

SWEET DREAMS!

In the progressive 19th century the patient's horror of surgery became a thing of the past. From 1846 on, the surgeon used **ether** to put the patient to sleep; he could then cut, arrange and rearrange without anyone screaming for mercy. Unfortunately, in the early years of the century the cleaning and disinfecting of surgical instruments was a rarity, so many patients failed to survive a successful operation.



EVERY CLOUD HAS A SILVER LINING ↑

Fortunately, we find ourselves in a ground-breaking century whose scholars left nothing to chance. A series of unexpected post-surgery deaths caused them to realize the fateful connection between cleanliness and survival. After that, they disinfected as if their own lives depended on it ...



WHAT ARE YOU EATING? YUCK!

In their search for causes of disease, physicians long ignored cholera, which raged through one family after another, not least in the city slums of Great Britain. Doctors blamed fear and rage, stale or spoiled food, cold melons and cucumbers. None of them made the connection with infected water.

Are you really such a brave chap that you would drink this? Not even my pig would want it!



← PULL YOURSELF TOGETHER!

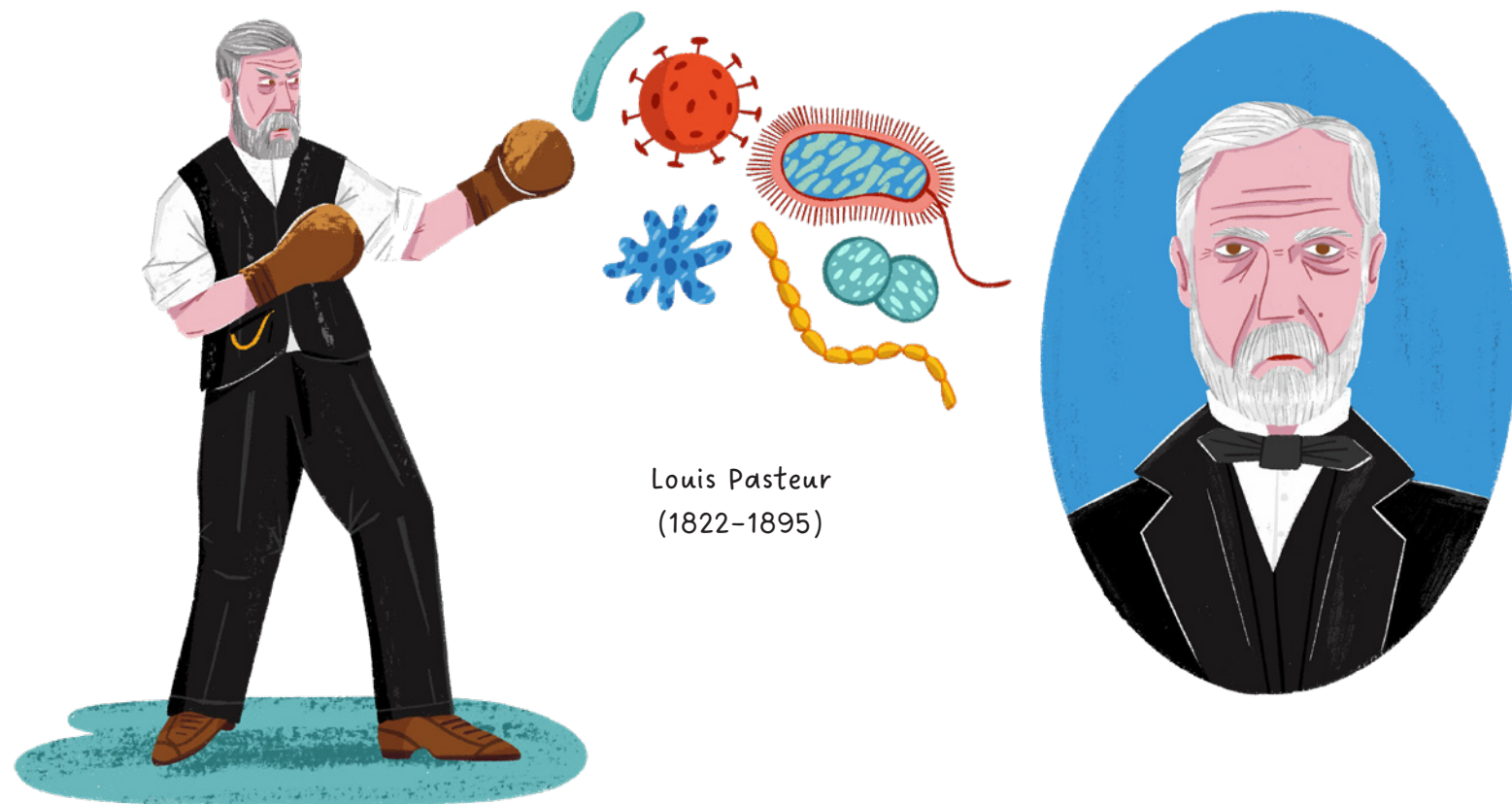
Although the time was a progressive one, at the beginning of the century physicians continued to believe that disease was caused by inherited susceptibilities and/or poor lifestyle. It didn't seem to occur to them that illnesses spread rapidly in an unhealthy climate. They might blame smallpox or measles on a sedentary lifestyle or wet feet, certainly not on air- or waterborne bacteria.



John Snow
(1813–1858)

JOHN SNOW ↑

So determined was British physician John Snow to track down the causes of cholera that he frequented the London district of Soho, which was particularly badly affected, and followed every lead in quest of the terrible sickness. He pondered and pondered until, in 1854, he hit on the answer: cholera was contracted in a miserable, filthy environment where there was no clean water. Quite a leap from melons and cucumbers ... Strict hygiene was on the agenda at last.



Louis Pasteur
(1822–1895)

DAMN GERMS! ↗

“I’ve got it!” French chemist and biologist **Louis Pasteur** cried out in joy every time his experiments showed that germs were to blame for many diseases. We know now that disease can be prevented by use of **antiseptics**.

LONG LIVE VACCINATION!

In addition to his great discovery, Louis Pasteur developed a vaccine effective against much-dreaded rabies, and it was given to many people. His legacy inspired other physicians, who developed vaccines against a great many various diseases.



Don’t worry, Mr Scrooge. As soon as I’m done with you, I’ll vaccinate the dog too. It would be wrong not to.

SURGICAL INSTRUMENTS OF THE 19TH CENTURY



A WOMAN PHYSICIAN? ➔

Have you noticed that so far in this book all the physicians were men? If a woman happened to appear, she was probably an elderly herbalist. Now’s the time to set that right. In 1849, **Elizabeth Blackwell** had just completed her studies in Medicine in the state of New York, making her the world’s first qualified woman physician. What is normal today was then something incredible!

GIVE WOMEN A CHANCE

To be the only woman physician was not part of Elizabeth Blackwell’s plan. She knew that many women shared her wish to become a doctor, so she spent much of her life promoting the rights of women and girls to study at university.



Elisabeth Blackwell

20TH CENTURY



Phew! At last we've made it to the 20th century, whose respected medical practitioners recommended treating toothache by intravenous injection rather than with pigeon droppings. Human medicine had made a great leap forward. Surgical patients could sleep through their operations, doctor's instruments were clean, and the miracle of the X-ray allowed them to see inside you without first opening you up! How brilliant!

As you can see, madam,
the shoes you have
chosen fit your son
TO PERFECTION!



Sometimes it pays not to be too strict about keeping things sterile. Had Mr Fleming not left a bowl of material under investigation on his desk for a little too long, perhaps he would never have discovered penicillin.

FIGHTING INFECTION

In the first half of the 20th century, medicine was much occupied with prevention and treatment of infectious diseases, taking up where 19th-century medicine had left off. Clever medical scholars racked their brains as to how microbes and germs could be defeated. You have to admit that the results are impressive.

← THE X-RAY IS KING

The early 20th-century couldn't get enough of the sharp-sighted X-ray! Everything got X-rayed at every possible opportunity. You would even find special X-ray machines in American and European shoe stores. Thanks to the shoe-fitting fluoroscope, the customer could see perfectly whether the shoes she or her offspring was trying on were a good fit. Fascinating, isn't it? Of course, in those days no one had the vaguest notion of the radiation hazards ...

HURRAY FOR ANTIBIOTICS! ↑

I've got it! On a day in 1928, British bacteriologist **Alexander Fleming** (1881–1955) may well have danced around his desk, having just discovered penicillin, the first antibiotic substance to kill unwanted bacteria and prevent their growth. (Oddly enough, penicillin is itself developed from other bacteria and moulds.) Penicillin was soon making short work of infectious diseases.

God bless
abdominal
surgery
and proper
anaesthesia!

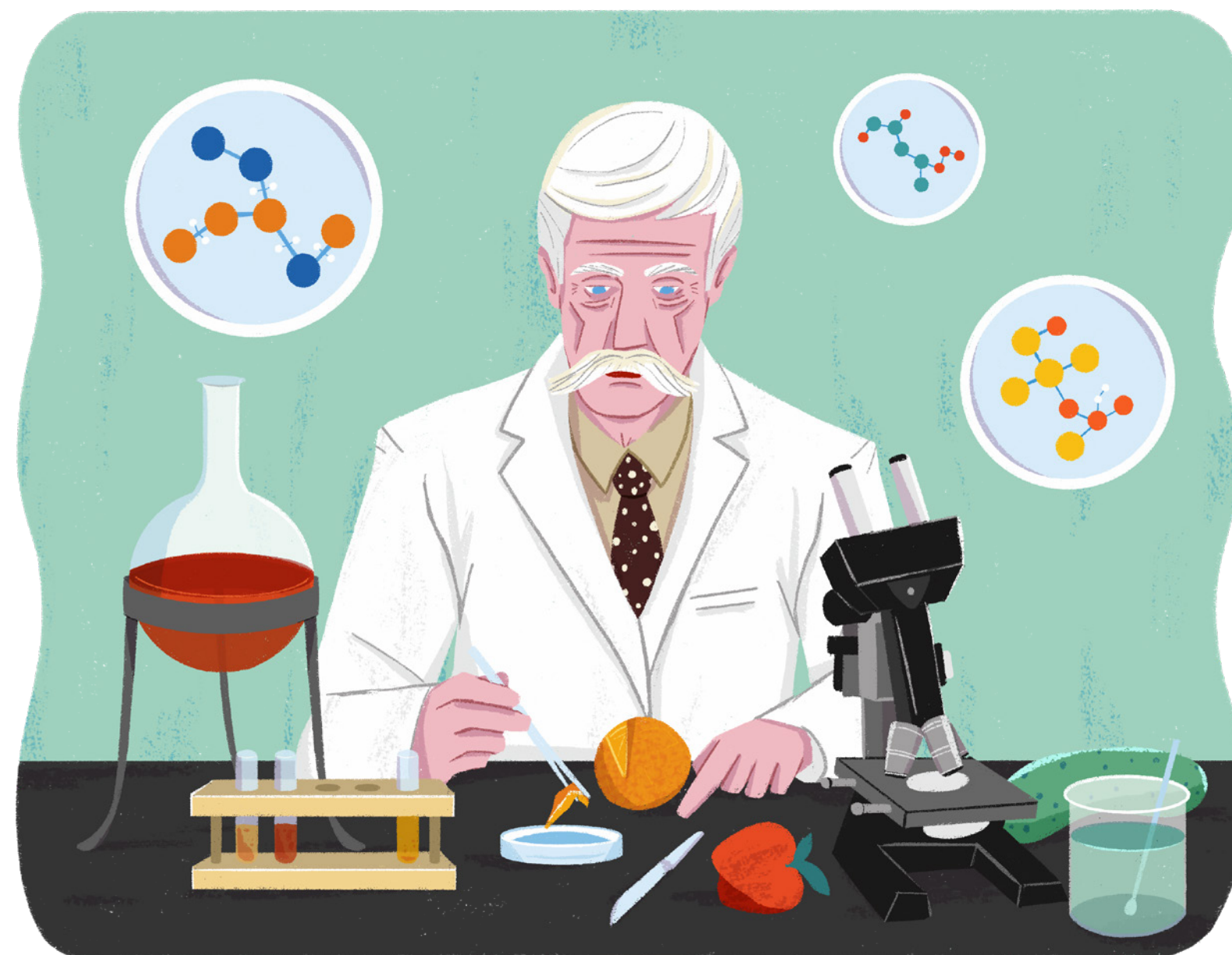


← SURGERY, DISCIPLINE OF KINGS

In June 1902, Britain's King Edward VII was looking forward to his coronation. Then, on the eve of the ceremony, he came down with appendicitis, and was in such pain that his physicians had no choice but to operate immediately. Thanks to this early intervention, medical advances that made possible the use of general anaesthesia and anti-septics, and the sterilization of instruments, Edward VII survived what would be a straightforward procedure today. Before long, he was enjoying his coronation. Once much maligned, surgery was catapulted into the limelight by this case.

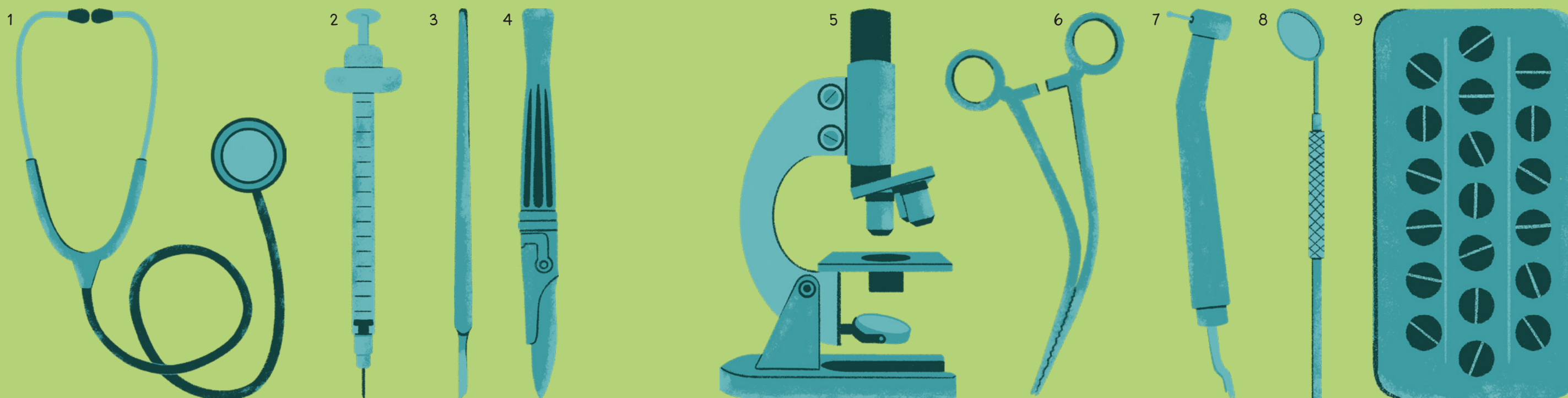
VITAMINS: SMALL BUT CRUCIAL →

Do you remember Dr Lind from the 18th century and his discovery that scurvy could be successfully treated with oranges and lemons? In 1912, Sir **Frederick Hopkins** discovered vitamins and emphasized their beneficial effects on human health. Only now was cause of scurvy known scientifically: a lack of vitamin C. This explains why oranges and lemons were so effective against it ...



EXAMPLES OF ALMOST CONTEMPORARY INSTRUMENTS

- 1 - stethoscope
- 2 - syringe
- 3, 4 - scalpels
- 5 - microscope
- 6 - clamp
- 7 - dental drill
- 8 - dental mirror
- 9 - antibiotics



Frederic
Banting



DIABETES, DO YOUR WORST!

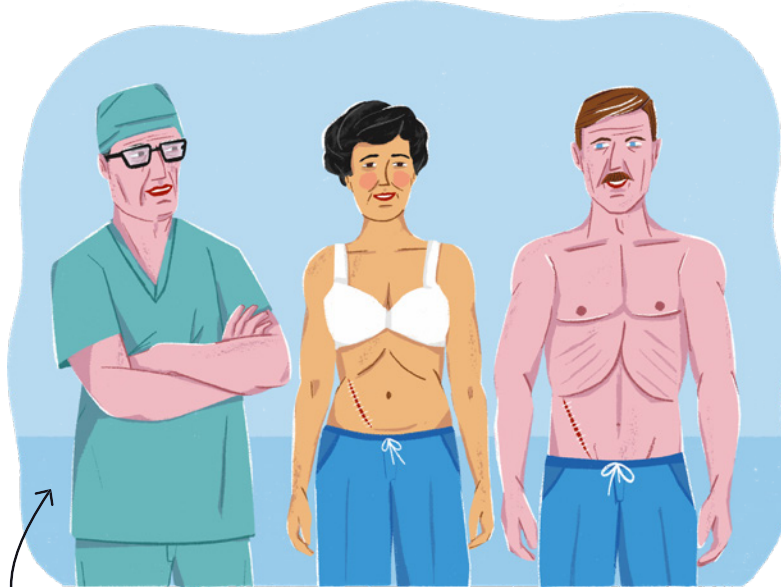
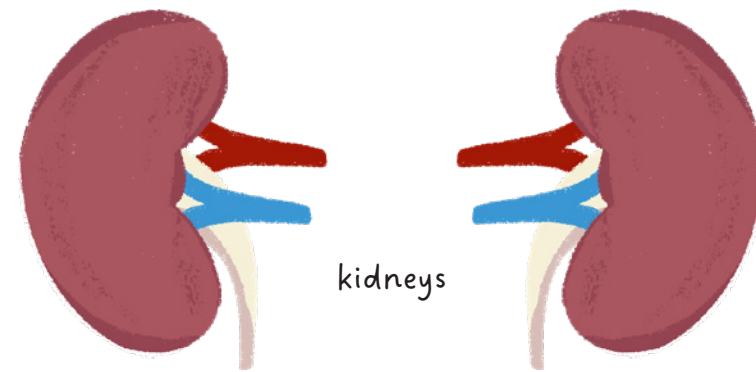
In earlier centuries diabetes was a killer. The body of someone with this disease suffers from lack of a substance called insulin, making it incapable of regulating the level of blood sugar. In order to survive, diabetics had to keep to a very strict diet. In 1921, clever Canadians **Frederick Banting** and **Charles Best** isolated insulin from the pancreases of calves and gave it to patients with diabetes – so giving diabetics of the 20th-century the chance of a full life.

Charles
Best



MUSIC OF THE FUTURE

Job done: the first half of the 20th century had largely won its fight against infection. In the second half, medicine switched its focus to new fields, such as **genetics** and **immunology**, as well as general technological progress.



Richard H. Lawler having performed a successful kidney transplant

DISEASED KIDNEYS? NO WORRIES! ↑

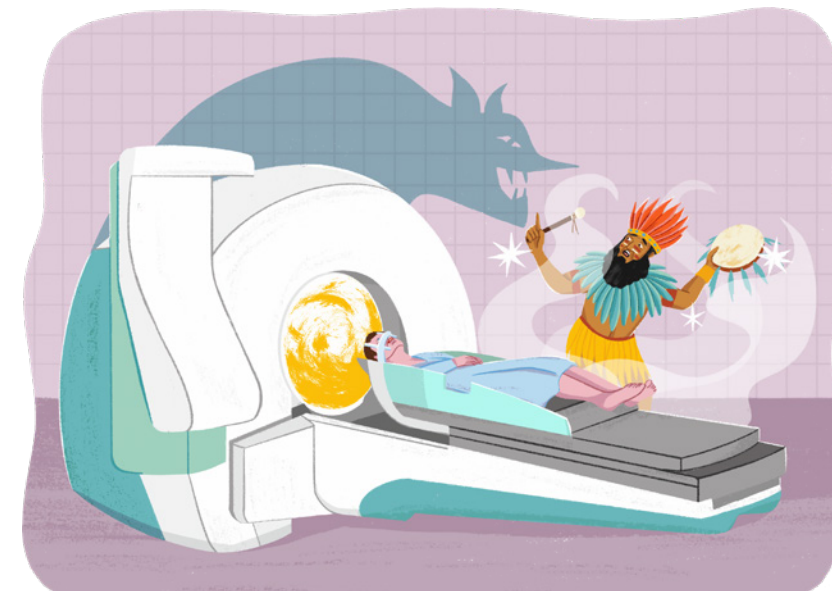
Because they can be replaced! On 17 June 1950, American physician Richard H. Lawler succeeded in surgically removing a patient's diseased kidney and replacing it with a healthy one from a volunteer donor. The body accepted the donated kidney, so launching the miraculous age of transplantation! The first heart transplant was performed in 1967. Fantasy had become reality.

Heart is ok, but what about the eye?



BLOODLESS SURGERY

Do you remember that in earlier centuries barber surgeons and quack doctors would operate on fully conscious patients? And that bleeding wounds would be closed with a hot iron? Well, we can now put that horror out of our minds. We find ourselves in an operating theatre in 1986, watching the first operation performed with focused laser beams. That's right – laser surgery has got the green light to perform painless, bloodless, clean work!



← THE BOISTEROUS HEART

A misfiring, stumbling heart needs a little support, concluded Swedish physician Ake Senning in 1958, when he was performing surgery on a patient with an irregular heartbeat. So he fitted the heart with a special alarm clock – the first cardiac pacemaker. But this excellent work had a downside: as the pacemaker was powered by an external source, the patient's chest had various wires sticking out of it. After four years of improvement, however, the owner of a new pacemaker had the whole device tucked safely away in the chest.

You only live twice!



TREPPANNING

The careful reader of this book will know that trepanning was a standard medical procedure over many centuries. We might speculate on the reaction of a flint-wielding hunter-surgeon of Palaeolithic times granted a view of a certain operating theatre in 1933, when Leksell's gamma knife was used for the first time. Powerful X-rays emitted by this special device penetrate the brain painlessly to irradiate a diseased area. Such magic would be far beyond the prehistoric hunter-surgeon's comprehension. The mere sight of it would surely cause him to run away screaming ...

GLOSSARY OF TERMS

A

Acupuncture
A millennia-old healing tradition originating in China that involves the insertion of needles into acupuncture points on a person's body.

Amputation
The surgical removal of a limb.

Antiseptics
Substances that reduce the possibility of infection.

Ancient Greece
Is the period of Greek history in antiquity – that is, the 8th – 1st centuries BC.

Ancient Rome
An ancient civilization whose origins are linked to the city of Rome and which lasted from 753 BC to the 5th century AD.

Apollo
Greek god of the sun, light, harmony and beauty, he was in charge of medicine, among other things.

Astrology
The study of the position of the planets at a particular time and from a particular place on planet Earth and their influence on humans and all events.

Astronomy
The science that studies the universe.

D

Dentist
A doctor who treats teeth and oral health.

Diagnosis
Determination and recognition of a disease based on its manifestations.

E

Ether
An intoxicating gas intended to numb the patient during surgery to relieve his suffering.

F

Fiber
Fine thin-walled blood vessels that connect veins to arteries.

G

Genetics
The field that deals with genes and heredity.

Gynecologist
A physician who specializes in the treatment of the female reproductive organs.

CH

Cholera
A deadly disease that thrives in environments with poor sanitation.

I

Immunology
Medical discipline studying the body's defenses – immunity.

Insulin
A hormone that lowers blood sugar levels, produced by the pankreas.

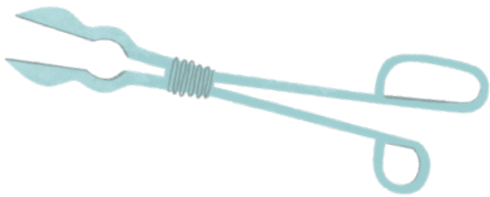
Internist
A doctor who specializes in diseases of the internal organs (stomach, heart,lungs, liver).

L

Leprosy
Also leprosy is a chronic infectious disease that affects the skin and mucous membranes, especially on the face and extremities. Over time, this causes parts of the body to fall off.

M

Meridians
The pathways of the human body through which life energy and power flow.



Mesopotamia
An ancient empire, one of the great cradles of civilisa-tion, situated between the Euphrates and Tigris rivers.

Mosque
A temple in which followers of Islam worship pray.

Mummification
A process designed to preserve the body of a deceased person in a preserved and intact state.

N

Neurosurgeon
A doctor who does brain surgery.

P

Paleolithic
Or the older Stone Age, is the oldest and longest period of human history. (2.5 million years – 1 million years BC) Paleolithic people used stone as the basic material for making tools.

Plague
A very dangerous infectious disease transmitted mainly by rodents.

R

Red blood cells
Blood cells produced by the bone marrow.

S

Scalpel
A very sharp surgical knife.

Shaman
Tribal healer and spiritual authority.

Scurvy
A disease caused by a deficiency of vitamin C. It most often affected sailors who sailed for long periods at sea without a supply of vitamin C-rich foods.

Sumerians
The world's oldest historical people who left behind written monuments and created a significant culture. The Sumerians settled in Mesopotamia at the turn of the 4th and 3rd millennium BC and resided there until 2340 BC.

Surgeon
A physician who treats diseases and injuries through surgery.

T

Trepanation
One of the oldest surgical procedures (performed as early as the Stone Age), which consists of drilling a hole in the skull.

Tuberculosis
A serious infectious disease of the lungs.

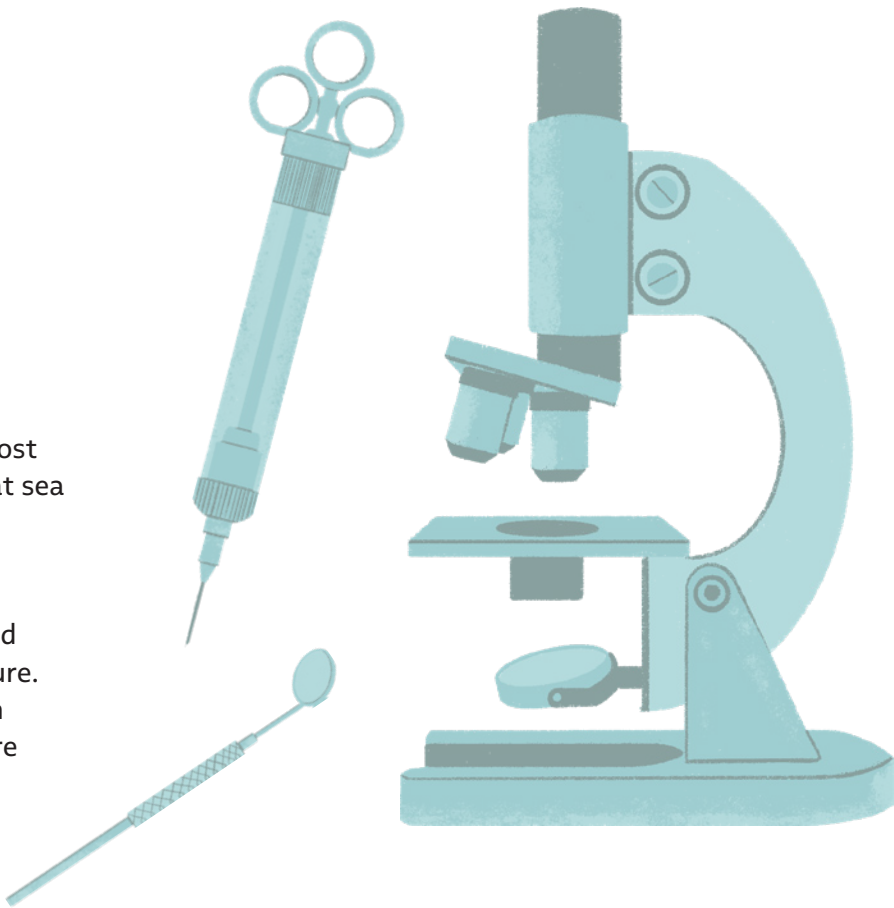
Typhoid fever
A dangerous intestinal disease caused by contaminated water, milk or food.

W

Wuqinxi
Ten exercises that release the flow of vital energy in the body.

Y

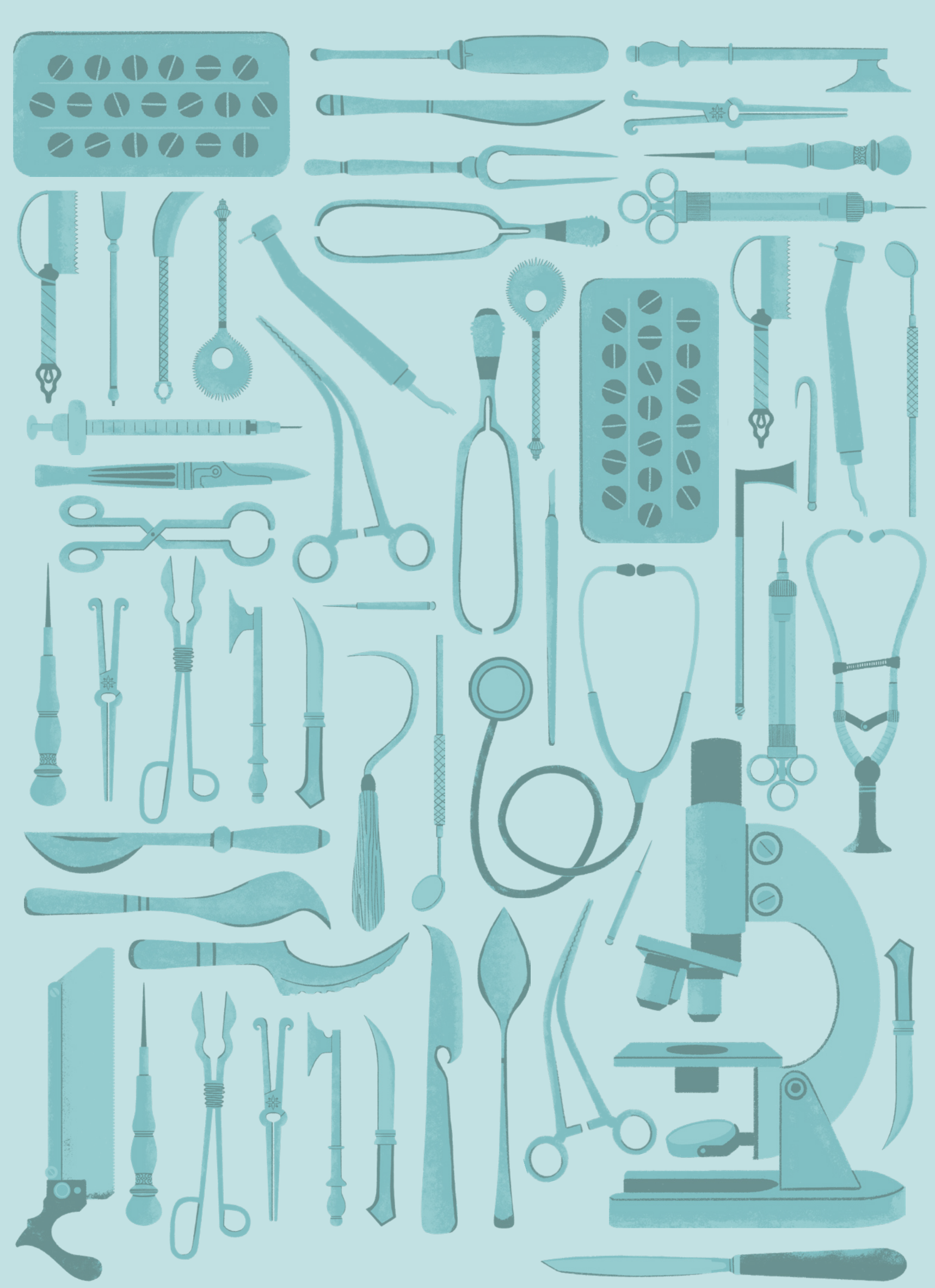
Yin and yang
Chinese characters, inseparable parts of a whole, representing darkness and light, death and birth, female and male energy.





FROM SHAMANS TO NEUROSURGEONS

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FROM SHAMANS TO NEUROSURGEONS

WRITTEN BY ŠTĚPÁNKA SEKANINOVÁ
ILLUSTRATED BY MATEJ ILČÍK

Wherever there is a man, there is also a disease, an indisposition and other pain. Today we have specialized doctors for this, but what about in the past ... in such a prehistoric time, how did they cope with diseases? The earliest doctors on planet Earth were shamans, powerful medicine men. They understood herbs, the forces of nature and, in the imaginations of their tribesmen, the magic of nature. On the other hand, simple wounds and injuries could be dealt with by anyone in those days. All they had to do was watch the animals and follow their instincts. And what about the ancient world, the Middle Ages, the Renaissance, or even as recently as the twentieth century? You will find all this in the pages of the book you have just got your hands on. So come and take a good look at these shamans, surgeons and healers.



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