

Out of the dispensary and into the jungle

This year, 105 war veterans from the UK, including pharmacist Maurice Cutler, travelled to Malaysia to take part in a parade to celebrate its 50th anniversary of independence. In this article, he tells the story of his two years in national service, which took him from Leeds to the jungle

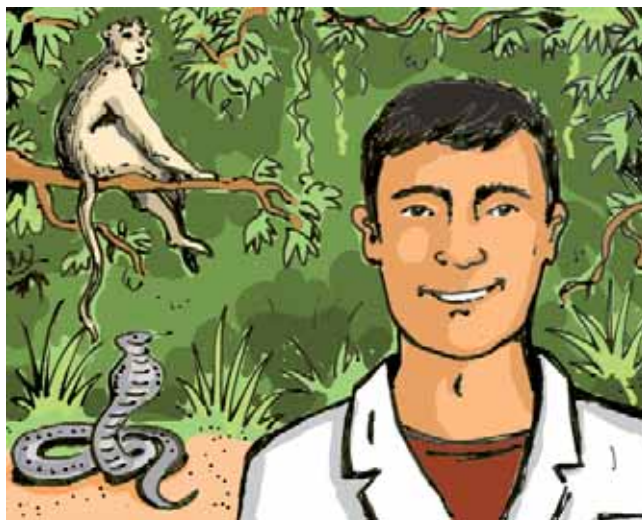
Having qualified as a pharmacist in 1955, it was not long before I received notification that I was to go for a medical examination. I was pronounced "A1", the highest category of fitness, and shortly after I received my calling-up paper: I was going into the army and was to report for training at Crookham in Hampshire.

On my arrival at Crookham I was informed that I had been selected for the Royal Army Medical Corps and was assigned to E Company, an elite unit earmarked for special training. I completed basic training without any difficulty. It took about 10 weeks and, unusually, I was promoted to lance corporal (one stripe) then to corporal (two stripes) and then to sergeant (three stripes). I was then given my first posting to the army physical training depot at Oswestry in Shropshire, close to the Welsh border, where I undertook an extensive "toughening up course" — a complete mystery to a pharmacist.

At that time national servicemen and regulars were being posted to various parts of the world, including Germany, Egypt, Hong Kong and Kenya, where the Mau Mau rebels were causing problems. A few fortunate soldiers were posted to the Caribbean or, as pharmacists, were doing their duty ferrying troops back and forth to the Middle East or the Far East on boats like the *Empire Fowey*. No such luck for 23181445, Sergeant Cutler M RAMC — a telegram from the War Office said I was to go by air to Singapore, then on to Malaya on active service. This was unusual for a national serviceman.

Before we were to depart, we were given two weeks' embarkation leave. I had not been home for three months so this was something to be enjoyed, but on arriving home I found my father sad and my mother with tears in her eyes. They were both worrying about my fate. Nevertheless, I arranged a leaving party in the Kardomma Cafe in the centre of Leeds. It was a lunchtime party, so that all my friends, who were working, could attend. As a parting gesture, I remember throwing my university scarf — which, in those days, attracted the young ladies — up in the air like a bride's bouquet.

When my two weeks were up, I reported for duty back at Crookham, collected my jungle kit and set off on the 8,000-mile journey to Singapore. Unlike present day air travel, the journey took five days. The aircraft was a specially chartered four-engined Hermes. All personnel had to travel in civilian



clothes due to regulations against military personnel flying over certain countries. Our first stop was Brindisi (at the tip of Italy) for refuelling. Then it was on to Beirut for an overnight stop. Early the following morning we flew to the Persian Gulf, stopping for refuelling at Bahrain, then on we went to Karachi where, for the first time in my life, I saw an Indian snake charmer blowing on his flute while the magnificent king cobra did its dance.

The views over the Persian Gulf were breathtaking, with brilliant sunlight, golden sands and a multicoloured sea. Equally astonishing were the early morning sights of Karachi. We had booked into a palatial hotel in the heart of the overcrowded city. Outside was hot and humid and, for a young man from Leeds, the giant ceiling fans were a welcome relief. In the morning we had an early call and breakfast was served at 4.30am. The scene on the pavement outside was one I can never forget. Either side of the hotel entrance lay a mass of bodies sleeping their way through the night packed close together, just like sardines.

Travelling the 1,400 miles across the breadth of India, from Karachi to Calcutta, was made memorable by the sight of the meandering Ganges. We had an overnight stay in Calcutta, where the heat was unbearable. Once again we were to take off early the next morning. I remember ordering eggs on toast for breakfast, which was duly delivered. Sitting on the single slice of toast were four small poached eggs. I was not sure of the origin of the eggs so I did not eat them.

We boarded the aeroplane at 6am. We refuelled in Bangkok and the final leg of our journey took us down the Malay Peninsula to land at Changi Airport, Singapore. My lasting memory is of the archipelago at the foot of

the peninsula. From the airport we were taken in a three-ton truck to Nee Soon transit camp. Moving across the island of Singapore was exciting, seeing the mosques and colonial buildings, temples, markets and masses of people, including attractive women in their silk cheongsams. There were Malays, Chinese, Eurasians and Indians, which was fascinating as I had never before seen such a multicultural society.

Bandit territory

On my arrival at Nee Soon I was immediately told that I would be going into bandit territory in Malaya, where the Chinese communist terrorists (CT) were active. I

was to join 39 Field Ambulance, part of 17 Gurkha Division, a front line unit that went anywhere alongside the assault troops. My destination was Raub in the province of Pahang, deep in the heart of the jungle. I waited three days for an armed convoy to take me to my destination. The armoured column that formed consisted of two Land Rovers, front and rear, both armed with Bren guns, two three-ton trucks and an army personnel carrier in the middle of the convoy. I was to ride in the passenger seat of the second Land Rover, armed with my rifle and several rounds of ammunition. We took the same route that the high commissioner, Sir Gerald Templar, had taken some few years earlier when his convoy had been ambushed and he had been killed. It was soon evident what a dangerous road it was. There were deep ravines on one side and high mountains on the other, all covered by thick jungle, and the incline of the winding roads was so steep that it was impossible to travel at more than 10 miles per hour — ideal for bandits. There were no terrible events on the eight-hour journey, but by the time we arrived at the jungle clearing I was tired and thirsty.

The camp itself, known as Silver City, consisted of corrugated tin huts on a hillside surrounded by thick vegetation. I was shown to my quarters: a tin hut with a concrete floor and no windows or doors. Inside were four small beds, each covered with a mosquito net, and a small locker beside each. That first night, I was introduced to the warrant officers and sergeants in the mess and to gorkha rum. It was clear and colourless, with a reasonable taste, but very potent stuff. I still remember the hallucinations it gave me and I never drank any more.

Jungle training followed — we had to be able to go into thick jungle, by foot, motor



vehicle or helicopter if necessary — and, after eight weeks my unit was moved to another clearing about 10 miles from the centre of Kuala Lumpur. A large part of this camp was surrounded by dense rubber plantations and tin mines. Our quarters and mess were atop (straw) huts.

We teamed up with a unit of the Royal Army Service Corps, which would provide transport for us as well as ambulances and I was introduced to the regimental sergeant major who, in turn, introduced me to all the warrant officers and non-commissioned officers in the mess. There was a look of shock on all their faces when they saw me. They were a hard bunch of regulars well into their forties and fifties. Unlike me, a 22-year-old national serviceman, they had come through the 1939–45 war. Some had seen service in Korea and others had been parachuted into Arnhem.

Duties

My job was to set up a medical store and dispensary that would serve all the troops in Malaya, including those as far as Singapore in the south and the Siamese border in the north. My responsibility was to order, store and supply medicines, and to make any that were not obtainable, improvising where necessary. For example, the doctors liked to prescribe Mist Bismuth Sed for stomach problems but bismuth was expensive so I would substitute it with kaolin, which was readily available. The dispensing was usually by the half gallon, sent out to whole battalions.

I had the luxury of a refrigerator containing many vaccines, such as typhoid, paratyphoid A and B, cholera, tetanus and smallpox, and assorted anti-snake venoms, along with masses of penicillin — in the jungle climate, the slightest scratch can quickly become infected. In the warehouse I also had a room full of condoms, which had to be kept as cool as possible to prevent the rubber deteriorating in the humidity and heat. It was a fact of army life that soldiers would seek out female company and we would also supply small tubes of mercurial ointment — squeezing a bit into the urethra was thought to help prevent sexually transmitted disease. That failing, a penicillin injection was given. I was also responsible for maintaining dental supplies for a mobile dental unit (a three-ton truck decked out like a dental surgery).

I was on duty 24 hours a day, seven days a week (unlike my staff of eight Malay soldiers) because we occasionally received telexes requesting urgent supplies that had to be made up and dropped by parachute to the troops operating in the ulu (jungle). The trouble with an airdrop was that it told the CT where the British troops were (especially if the dropping aircraft was a Douglas DC-3 Dakota). All the urgent supplies were delivered to special dropping zones, but trials were being conducted with Austers (lighter aircraft) for small jungle drops from low levels (ie, without parachutes) making dropping zones more difficult to detect by the enemy.

Sometimes I had to go to Singapore for briefings about supplies. I would go on the overnight train from the magnificent colonial-style train station in the centre of Kuala Lumpur. On the train, I was usually given the job of guard commander of security, which required positioning an armed soldier at each end of each carriage and making sure that there was a relief for them every two hours. I was always given a sleeper carriage for the 12-hour journey and slept with my rifle, with the sling tied to my body. To lose a rifle or ammunition would have been a serious breach of military law, resulting in a court martial, but it was not uncommon for rifles to be stolen because they fetched a good price on the black market, as did penicillin, which apart from sulphonamides was the only available antibiotic. Furthermore, there was always a strong possibility of a terrorist ambush as the train travelled slowly through dense jungle.

Camp life

39 Field Ambulance was a mobile unit, which had to be able to move camp at short notice. Nothing in the camp was permanent, which is why we all existed under straw. The only permanent structures were the guardhouse at the entrance to the camp and the armoury. Even the kitchens were mobile.

The diet in our camp was poor. Because of rampant tuberculosis, we could only have tinned milk. Most of our other foods were tinned and we had special army rations of dried food. To supplement our diet, every morning with breakfast we were given two vitamin capsules (vitaminorum) together with our antimalarial tablets. In the evenings we drank the local Tiger Beer. On one occasion I was invited to Singapore to participate in a Friday night Kiddush (Sabbath evening celebration) at the home of Mrs Nissim, a famous Sephardi woman, whose family had originated in Persia. Her house was open to all service members every Friday evening and it was good to have some real Jewish food in me.

For relaxation, I kept myself reasonably fit and played rugby. Our unit formed a team and I captained both the 39 Field Ambulance team and the medical seven-a-side team, which won the trophy for central Malaya. The rugby fields were always as hard as concrete, except during the monsoon season, when it rained in tremendous volumes and the pitches became quagmires. (We had, as part of our jungle kit, rubber ponchos, which stretched from the neck down to the ankles to keep us reasonably dry during the monsoons.) I also played for the combined services team in Kuala Lumpur, which included three men from 22 SAS. 22 SAS shared our camp (although they went on completely different operations) and I was responsible for supplying their special medical supplies, which included special suturing and resuscitation equipment to be used in the field. In addition, the use of morphine for the SAS seemed more liberal, probably because of the

greater risks they took. Apart from rugby and swimming, the only other pastime was the Malay national sport of badminton.

Part of my other duties was to be in charge of the mess every four months. I soon learnt how to look after the catering and, most importantly, to keep the mess bar fully stocked. Having plenty of drinks was important to the morale of the soldiers because of the lack of recreation, and running out of beer was the worst thing you could do. I would check stocks as often as I checked the medical supplies.

Disease was always a problem in camp, and most soldiers had one or another. The most common were skin complaints, usually dermatitis, dhobi itch, ringworm or prickly heat. A lot of the men had foreskin problems and it was common to see a truckload of soldiers going off to hospital for circumcision and spending the next week walking around the camp bow-legged. Then there was dengue fever, picked up in the swamps (or anywhere else where there was stagnant water) and, of course, there was malaria. We were never given any repellents, but were advised to use non-perfumed soaps so as not to attract the mosquitoes.

There were numerous other insects to make life uncomfortable. Ants were always a problem especially the giant ones, which would bite. The latrines were a bucket in a wooden box covered with a wooden seat and lid. This was enclosed by a square of metal corrugated tin, open at the top and bottom. Going to the toilet was an art. You had to lift the lid and sit on the seat without any delay or you would have a bucket of flies and insects buzzing underneath your bottom. The buckets were emptied daily by a Chinese contractor. We called him the honey bucket man. He would empty them just before dinner, balancing a bucket on each end of a bamboo pole, which he carried over his head and across his shoulders. Snakes were common and it was not unusual to find a whole snakeskin on the floor of the latrines first thing in the morning. The monkeys were also numerous, persistently chattering, and sometimes violent.

Leeches were a real problem. They seemed to prefer the groin and testicular area and the easiest way to remove them was by burning them off with a lighted cigarette end. If you tried to pull one off, all you would achieve was the removal of its body — the head would remain firmly fixed to your skin, still sucking blood.

After being on duty in the heat and humidity for so long, many of the troops suffered with exhaustion and so two rest camps were available. One was in the Cameron Highlands and the other was in Penang. I was in touch with a schoolmate, Mike Elbogen, who had an easy number being pharmacist at Singapore Base Hospital. We both decided that a holiday in Penang would be good for us. The camp was situated on the Battu Ferringhi beach. The accommodation and food was good and my regimental sergeant major, WO1 Webberly, a regular, also joined us.

Going home

At the end of my two-year tour of duty, I received instructions that I was to be released from Her Majesty's service. I was looking forward to flying back to England. When I returned to Leeds, however, things were not as I had imagined. Most of my friends had dispersed — some had married and others had moved away. In addition, I realised that I had picked up malaria despite always sleeping under a mosquito net and, being a pharmacist, religiously taking my Paludrine every morning. It was some years later that I discovered that the tablets should have been given to us for 14 days after leaving the infectious areas — something we had not been told about.

I had also developed a peculiar pale yellow complexion, which all the soldiers had on their return from Malaya. This was the side effect of the antimalarials.

I tried to pick up where I had left off but I was not the person who had left Leeds. I was much more introvert, had little conversation and suffered what I can only describe as a type of post traumatic stress disorder. It took me two to three months to get back to normal. In the following years, I worked as a locum, got married, had children and eventually started my own business, which grew to a chain of seven pharmacies in and around Leeds.

I look back at my national service as the time when I grew up. I became independent

and learnt how to look after myself. It instilled in me the trait of taking pride in myself — to this day, my shoes are always polished and my trousers always pressed. Another lasting habit is that I always use non-perfumed soap when I go abroad.

National service did us a world of good. It taught people from all walks of life, from bricklayers to doctors, how to get on, as well as about cleanliness and respect. When I think of a lot of the problems with youth today, I believe that national service could be one solution. It was a great surprise to receive an invitation this year from the Malaysian government to the 50th anniversary celebrations of *merdeka* (independence). It did not take me long to decide I would go.

Pharaohs and the first prescriptions

Throughout history, literary records credited the Greeks as being the originators of pharmacy. Equally meticulous in their recordings were the ancient Egyptians, but not until Champollion, after Young, deciphered the Rosetta Stone in 1822 were scholars able to understand what they wrote. In this article, **Jackie Campbell** describes the pharmaceutical skills of the ancient Egyptians

Almost 1,500 years before the Magi brought gifts of frankincense and myrrh to Bethlehem, the ancient Egyptians included them among their vast materia medica. Some 2,000 prescriptions are recorded. Many possess therapeutic merit and have enough detail to make them reproducible today. Ironically this wealth of information was unknown until archaeologists discovered ancient Egyptian documents in the 19th century and only in the early 20th century came the first indication that the ancient Egyptians practised a credible form of medicine 1,900 years before Galen. In the past five years scholars have verified the materia medica and efficacy of prescriptions recorded from the time of Amenemhet III (1842–1797 BC) to Ramses III (1182–1151 BC), a period pivotal to the history of pharmacy.

History attributes rational medicine to Hippocrates (ca 460 BC) and medical origin to Thales of Iona (624–554 BC). Before Thales, medical history resided in mythology, which attributed drugs from plants to the centaur Chiron and medical practice to the Greek god Asclepius. Asclepiades (ca 100 BC) brought Hippocratic doctrine to Rome, while Celsus (ca 40 AD) recorded the materia medica. Dioscorides (ca 50 AD) wrote the first pharmacopoeia and Pliny the Elder (23–79 AD) produced an encyclopaedic account of medicinal plants. Claudius Galenus (ca 130–200 AD), subscribing to Hippocratic doctrine, laid the foundations of pharmacy, but transmission of his knowledge, influencing medicine for 1,500 years, pursued a tortuous route, from Ancient Rome to the Byzantine Empire and then Persia.

In the 5th century AD, the Byzantine period, Oribasius translated Galen's texts into Syriac and within 200 years, Islam having



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united the near east, adopted Galen's teachings to influence Persian medicine until the time of Avicenna (ca 980–1037 AD). Combining Galenic protocol with Persian medicinal tradition, Avicenna's 'Canon of medicine' was brought to Salerno, from where it was transmitted to Moslem Spain. The 12th century Jewish exodus brought his knowledge to England influencing medicine into the 16th century, when contemporary medicinal herbals became the precursors of modern pharmacopoeias.

However, the medical papyri translated after the decoding of the Rosetta Stone indicate not only that Egyptian medicine predates Hippocrates but suggest the ancient Egyptians practised pharmacy.

Ancient Egyptian medical records

The materia medica is recorded in 12 medical papyri written in hieratic script, a shorthand development of hieroglyphs, detailing the ail-

ments and treatments endured in ancient Egypt. Translated into Latin, German or English, they illustrate the relative sophistication of medicine in ancient Egypt, continuity of practice and longevity of remedies. Most significant pharmaceutically are:

- The Kahun Papyrus (ca 1850 BC) dating to Amenemhet III (this was found by archaeologist Flinders Petrie at the workman's village in the Fayoum, and contains 33 gynaecological remedies)
- The Edwin Smith Surgical Papyrus (ca 1550 BC), detailing 48 cases of physical trauma
- The Ebers Papyrus, dating to Amenhotep I (1546–1526 BC), found in the Valley of the Kings and containing 877 remedies
- The Chester Beatty Papyrus found at Deir el Medina, dating to Ramses III (1150 BC) and specialising in colorectal conditions

The format of remedies is consistent and formulaic. They commence "a treatment for" and detail the drug, formulation, preparation and dosing regimen. For example, in the Ebers Papyrus, there is "a treatment to empty the belly to eliminate disease". The ingredients are colocynth and honey and the instructions are to ground finely and eat with sweet beer.

One prevailing problem is the reliability of translation, particularly with respect to drug identification. Scholars have endeavoured to reconcile a translation with a particular plant, rarely finding independent attestation to the unique vocabulary. The Linnaean system of classification was not introduced for another 3,000 years. Consequently, plants are cited by common name, which varies.

The materia medica, of ancient Egypt includes 134 plants, 90 drugs derived from 24 animals, 28 minerals, nine vehicles and 12 dressings. Among them are plants significant to pharmacy in the past century, including: *Acacia nilotica*, *Balanites aegyptica*, *Ceratonia siliqua*, *Phoenix dactylifera*, *Juniperus phoenicea*, *Pisatcia terebinthus*, *Punica granatum*, *Oleo terebinth*, *Salix fragilis*, *Hordeum vulgare*, *Cyperus esculentis*, *Linum usitatissimum*, *Coriandrum sativum*, *Anethum graveolens*, *Cuminum cyminum*, *Artemisia absythem*, *Aloe vera*, *Ammi visnaga*, *Styrax benzoin*, *Ricinus communis*, *Citrullus colocynthus*, *Boswellia carteri*, *Hyoscyamus muticus*, *Commiphora myrrha*, *Apium graveolens*, *Allium sativum*, antimony, copper, alabaster, natron and honey.

Formulation and preparation Ancient Egyptian prescriptions show awareness that formulation not only influenced efficacy but determined route of administration. The ancient Egyptians used creams, draughts, enemas, extracts, eye preparations, ointments, infusions and inhalations. They had linctuses, liniments, lotions, mixtures, mouthwashes, ointments, pastes, pessaries, pills, poultices, powders, solutions and suppositories. Formulations were characterised by the active ingredient, a vehicle in which it was carried, flavouring and a demulcent or, possibly, a secondary drug. Unusual formulations include animal dung and nutritious foodstuffs.

Instructions for preparation were specific, affording reproducibility. Drugs were ground, sieved, powdered or infused in water, alcohol or fat. The leaf, seed, fruit, root, bark, juice or resin was specified indicating concept of pharmacognosy. Remedies deployed capacity based on the *ro*. This is considered to be 15 ml by most scholars but some recent work proposes it as 60 ml. However, this variance would only be significant in the dispensing of the poisonous laxative colocynth. Almost 25 per cent of prescriptions detail measurements. Another 25 per cent of prescriptions can be estimated by precedent. For example, frankincense was usually being dispensed in a constant 0.5 *ro* dose. Topical remedies were without measurement.

Administration Oral formulations were taken immediately for a day or, more commonly, for four days (but rarely longer), heated, cold or "finger warmth". Laxatives were administered as a single dose before retiring, suppositories used on rising. Topical, non-systemic preparations were rubefacient, demulcent, cooling or emollient. Poultices relieved pain or brought infection to a focus.

Rectal preparations were prescribed to stimulate defecation, administer drugs or as demulcents. For example, remedy 134 from the Ebers Papyrus is "a treatment to cool the anus". It was a mixture of balanite oil, carob water, oil and honey and "injected" into the anus.

A treatment for a cough (remedy 326), contains orpiment, bitumen, s'm (an unknown ingredient) and fat. Instructions are to



Page 2 of the Kahun papyrus

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heat seven stones on a fire, place the ingredients on a hot stone, place a perforated vessel on the top and a reed in the vessel then to inhale the smoke through the reed and, afterwards, to eat fat or oil.

For a congested nose, the nostril was to be filled with date wine (Ebers Papyrus remedy 761) and instructions to remove an ear infection (remedy 768) are to:

Remove infection with a knife
Place oil and honey in ear with seed wool
Place strip of linen (bandage) in ear

Vaginal drugs were administered to bring the medicament into close contact with the mucous membranes. Aural, nasal and ophthalmic preparations including powders, ointments and drops, contained antibacterial agents and biocides mixed in any vehicle that would facilitate application.

Drug sources

The renowned agriculture industry of ancient Egypt was the pharmaceutical provider. As early as 2800 BC a picture develops of an increasingly organised agricultural system, harnessed to the needs of a population with a common objective of transforming a narrow, arid plain into productive fields. The annual flood water was channelled into the fields by a basin system of irrigation.

Barley, emmer and flax, sown in November when the Nile flood receded, provided alcohol, fibre, oils, demulcents and emollients. Dates were harvested with carob pods, figs and pomegranate, yielding stabilisers, laxatives, antiseptics, astringents and anthelmintics. The acacia flowered from October, followed by the pod, used medicinally. In January, gum was scraped from acacia stems and stored as chips to be used as stabilisers and demulcents, while onions and garlic were sown. In April, sycamore figs and cereals were harvested as melons, cucumbers and colocynth ripened, each with pharmaceutical properties. Young flax was harvested for fine cloth and bandages, with the dried seed heads providing linseed oil in May.

Cumin, dill seed and garlic were harvested in June. July brought the annual flood and a second harvest of sycamore figs. In August, water lily flowers were harvested and dried;

their centres ground, made into bread and used pharmaceutically. Grapes were harvested. Their wine was used to an extraction medium and, when soured (acidic), used as an antiseptic. Onions, plums and juniper berries were picked and all used in ancient Egyptian remedies for antiseptic, laxative and birth inducing properties, respectively.

Egyptian marsh dwellers expressed oil from ricin seeds and its many medicinal uses were recorded in the Ebers Papyrus. By October, the Nile's rich silt initiated the agricultural cycle again when olives, zizyphus fruit and a third crop of sycamore figs were gathered, each with laxative, diuretic or astringent properties.

Frankincense, cedar and coriander were acquired through trade with the Near East, Nubia, Libya and the southern Mediterranean. Animal products originated from husbandry or hunting, while minerals came from mining, smelting, building and jewellery industries. Drug availability probably paralleled food availability, being subject to the same threats.

Forensic evidence of diseases

Knowledge of diseases in ancient Egypt arises from the forensic work of a team at the University of Manchester, led by Rosalie David. Radiology has revealed skeletal trauma, tuberculosis, spinal deformities, spondylitis, herniated lumbar discs, arthritis, osteoporosis, degenerative changes, atherosclerosis and infestation. Dental disease resulted from attrition and abrasion of the teeth, caused by eating bread contaminated with grains of sand (during milling). Child mummies indicate the fragility of life for the young and Harris lines (growth arrest lines) on their bones indicate illness and physical demise. Evidence exists of the guinea worm, schistosomiasis and tape worm. Endoscopy has provided access to internal tissues, histology revealing sand pneumoconiosis and anthracosis from smoky fires. Intestinal infestation from stongyloides, ascaris, eccinococcus and trichinella has been revealed. Famine during pregnancy also manifests itself in bone histology.

Ancient Egyptian remedies

Laxatives dominated the Egyptian remedies and ingredients included fresh carob, aloe, castor oil and colocynth, bulk laxatives of bran, figs, fruit and lubricants of fat and oil. Calcium carbonate was used as an antacid, and figs, barley, soured milk and honey were used as digestants. Aggressive purgatives were mixed with anticholinergics, such as hyoscyamus, or carminatives (eg, cumin or coriander). Carob and gypsum were effective antidiarrhoeal remedies.

Heart conditions were less well treated because the ancient Egyptians had difficulty differentiating between the heart and stomach. They prescribed aloe, mustard, willow, hyoscyamus, pomegranate and ammi variouly containing glycosides or useful vasodilators. Diuretics included celery, honey, beer, carob and powdered dates.

Analgesics were few and restricted to carminatives or anti-spasmodics. There were effective antipyretics (eg, salt, alum and willow) but there is no evidence of the use of narcotics until the Roman period (30 BC) or indeed other sedatives, despite hemp being used in daily lives.

Musculoskeletal disorders were treated topically with warm bandages, poultices or rubefacients containing turpentine, mustard, juniper and frankincense. Celery seed was used by the Egyptians for painful joints and is now advocated for its antirheumatic properties. Saffron used for back ache in ancient Egypt, has long been acknowledged for its antirheumatic properties but is seldom used today because of side effects.

Gynaecological remedies controlled labour, conception, infection or predicted birth. Absinthe was used for menstrual disorders and pessaries of crocodile dung served as a barrier contraceptive, its acidity probably spermicidal. Pessaries of juniper oil, now known to stimulate uterine contraction, were inserted to initiate labour.

The ancient Egyptians would not have known that schistosomiasis caused the haematuria they described, but treatment was symptomatic, with demulcent preparations of barley water, acacia and biocidal antimony. Impotence is cited but the 39-ingredient remedy in the records would have had no efficacy.

Anthelmintic remedies based upon pomegranate, absinthe, thyme, and antimony, followed by a purgative, controlled tapeworms and round worms. Ancient Egyptian antiseptics and germicides were effective. Their phenols were thymol and bitumen; alcohols were beer and fermented wine and their acids were soured wine. Zinc, antimony and copper were used as astringents, mixed in any vehicle that would afford even distribution.

Coughs were treated with mixtures of honey, acacia and antimony; congestion with a nasal wash or aromatic inhalation. The plant *Ammi visnaga*, with its bronchodilator khellin, was used to treat respiratory conditions thought to be asthma.

Ophthalmic remedies were placed on the eye lid, margin or in the eye. Infections were treated with antiseptics of copper, honey, and child's urine. Acacia, carob and milk were used as demulcents. Antimony was used as we formerly used mercury (ie, as a biocide).

Mouth washes were of acacia, carob and milk, mixed with antiseptic yellow ochre, cumin and copper. Mouth ulcers were eased by chewing anaesthetising celery seed and nasal congestion by a nose plug of fragrant gum. Malachite, honey and oil were placed in the ear on gauze for infections, while drops of warmed balanites oil improved hearing.

Acacia gum and plant mucilage were used as skin demulcents. Balanites oil, castor oil and goose fat were used as emollients and to control infection they were mixed with salt, frankincense, malachite, ochre or lead and used in bandages. Ladanum treated dandruff but baldness was treated with fats, oils and, symbolically, with hedgehog quills. For burns,

an antibacterial mixture of turpentine, copper, oils and honey, was applied.

Pharmacopoeia

There is no evidence of any formal regard to toxicity or contraindications in the prescriptions, but the prescribing, formulation, preparation and dosage indicates awareness of potential benefits and dangers. An Egyptian physician could only deviate from the formatted remedy after four days of treatment, indicating a remarkable level of protocol.

There is no evidence that the ancient Egyptian physicians had a pharmacopoeia save an isolated monograph on ricin. Instead, the papyri fulfilled the role of a formulary. However, the remedies reflect the use of alcohols, antacids, anthelmintics, antipyretics, anticholinergics, demulcents and expectorants,



Colocynthis was used as a laxative

none being central or respiratory stimulants. The ancient Egyptians had dermatological agents and described exfoliators. Cardiac glycosides were few, prescribed subtherapeutically and there were no cardiac stimulants.

They used disinfectants and antiseptics but had no concept of sterilisation, being unaware of the causes of sepsis. They used frankincense for fumigation. Their embalming agents of myrrh, frankincense and pine resin were effective antiseptics as were onions, garlic and honey. Their only halide was sodium chloride. Natural diuretics were deployed subtherapeutically and bile salts of mammalian origin were used. Oral preparations were flavoured, with honey, sweet beer or fruit countering bitter products.

Body and leg ulcers were treated with honey and the dressings changed daily. Hypertension is not described but dom palm fruit and balanites oil are antihypertensive. Haemostatics were represented by fresh meat or sprouting barley (hordenine). There was little pain relief or anaesthesia. Chief among their natural stabilisers and suspending agents were acacia and carob. Essential oils were cumin, celery, thyme, dill, juniper and coriander. Mustard oil, pine oil and turpentine were used for warming properties. Fixed oils include castor, linseed, olive and safflower oils. Ointments and suppositories incorporated wax. Their most potent purgative was colocynthis.

Of the materia medica of ancient Egypt, 59 plants, 18 mineral and 15 animal sources

were cited in British Pharmaceutical Codex until 1958 and the British Herbal Pharmacopoeia contains a further 35 ancient Egyptian substances and 20 ingredients have nutritional worth. Moreover, 25 per cent of drug substances cited in the BPC 1911 were used in ancient Egypt. The remaining 75 per cent originate from India and the Americas, which were not Egypt's trading partners ca 1500 BC. Consequently the ancient Egyptians were without caffeine, narcotics, anaesthetics, antimalarials, anticonvulsants, antidepressants, vaccines and immunological agents. Hormones were not available to them but they specified that ass urine (high in progesterone and oestrogen post partum) be used. Homer refers to poisons known to the ancient Egyptians but they are not evident. Mandrake is depicted artistically, but is not identified in any recipe. Moreover, the ancient recipes are curative not sinister.

There is a view that the placebo effect of drugs used in ancient Egypt exceeded their therapeutic value. What is known of pharmacy in ancient Egypt indicates a society cognisant of the need for health care and treatment, utilising a diverse range of plant, animal and minerals to this end. Religion influenced all aspects of daily life in ancient Egypt, so it was intrinsic to medical practice and treatment. Although the importance of prayer and incantation is recognised, well documented rational treatment predominates endorsed by prayer.

Users The Kahun Papyrus was probably written for the midwife and the Edwin Smith Papyrus for military physicians. The Ebers Papyrus is multifunctional, perhaps being the notes of a physician, as with the BNF. Celsus (40 AD) is attributed with writing the first *materia medica* for use by non-medical people, but credit probably lies with the Chester Beatty Papyrus, which originated from a private household over 1,200 years earlier.

Pharmacy did not exist as an independent profession in ancient Egypt but there is compelling evidence the Egyptians adopted professional protocols and standards. Restricted by their limited knowledge of physiology, they based their treatments conceptually. Remedy 420 in the Ebers Papyrus is an eye ointment, to be made by Chui the Venerable, the high priest of Heliopolis. He did not have the title of pharmacist, but he probably practised the art. Moreover, the remedy had some efficacy.

Perhaps three wise men 2007 years ago knew of the pharmaceutical legacy of the ancient Egyptians and gave its most valued medicaments — gifts fit for a pharaoh.

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