The mystery and art of the apothecary / by C.J.S. Thompson.

THE MYSTERY AND ART OF THE APOTHECARY

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BY THE SAME AUTHOR

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AN APOTHECARIES SHOP

IN THE XVIII CENTURY

THE MYSTERY AND ART OF THE APOTHECARY

by

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THE MYSTERY AND ART OF THE APOTHECARY

CHAPTER I

THE ORIGIN OF THE ART OF THE APOTHECARY—BABYLONIAN AND ASSYRIAN HERBS, DRUGS AND PREPARATIONS

THE first instinct of primitive man to relieve pain resulting from accident, or a wound from a club or stone axe, would probably be to bathe the part with water or apply a large leaf to cool the injured surface. From experience he learnt that some plants gave relief from pain sooner than others, and so the healing properties of herbs came to be known.

Among the most primitive people there has generally been found some crude knowledge of healing, but some aboriginal tribes, like the Weddah in Ceylon, appear to have had but a very limited idea of the properties of herbs, and they only knew of a few barks and leaves which they employed for external application.

The original inhabitants of Easter Island are said to have known but three drugs, the Karoks of North California thirteen and the Ashantees of West Africa thirty-seven plants, roots and leaves which they used for the purpose of healing.

Before the days of priestcraft, the wise man or woman of the tribe, whose knowledge of the healing properties of herbs and plants had either been gathered from

experience or had been handed down by word of mouth from their progenitors, was called to attend the sick or wounded and prepared the remedy.

It was in the methods of preparing the substances thus employed for the treatment of an injury or a disease, either for external or internal use, that the art of the apothecary originated.

Among many races, disease was believed to be caused by the entrance of demons or evil spirits into the body, and so the treatment resorted to was that which would naturally be the most likely to expel these obnoxious intruders.

From early times, human ideas with respect to the action of drugs were associated with supernatural agencies. Demons or spirits were believed to be the cause of the phenomena of nature and were regarded as forces capable of producing good or evil.

There is said to have been a belief that certain curative plants and herbs contained parts of the souls or spirits of the gods that were benevolent to man, but that the noxious plants were the abode of evil demons and so wrought harm on human beings.

From the earliest records it is evident, that the primary methods of ridding the human body of the demons of disease were incantations and the application or administration of certain herbs or plants. Sometimes invocations to an unseen power or deity were employed alone, or in conjunction with material treatment in the form of drugs.

The recital of an incantation may have had some efficacy in soothing nervous patients, just as is known in the class of disease called neurosis, where drugs are of

little value, much benefit may be obtained by suggestion and other psychological measures.

Some plants and herbs were known by the priest-magicians to have definite remedial action, and it is mainly to these that was ascribed the power of casting out the demons of disease.

The art of the apothecary has always been associated with the mysterious, and its practitioners, owing to their peculiar knowledge of drugs of unknown power, some of which were capable of producing delirium and sleep, were believed to have connection with the world of spirits and so act as intermediaries between the seen and the unseen. So from the wise man of primitive times there developed a special medicine-man of a type found among savage races to-day.

As time went on this office became combined with priestly functions and, among the early civilizations, the priest-magician became the healer of the body as well as the soul.

According to recent research, the art of healing had its genesis in the East, and the earliest records known point to the north-west parts of India, Asia Minor and Egypt as being its birthplace.

It is, however, to the ancient records of the early civilizations of Babylonia and Assyria, we owe the most reliable information on the subject.

Jastrow, in his researches, found that the Sumerian name for Physician, which also passed into Akkadian, was A-SU, composed of two signs conveying the idea of "one who knows water" or a water expert, which he thought probably arose from the prominent part that water played in exorcizing the demons of disease. The

disease demons were regarded as a form of uncleanness, and water, like fire, was believed to be the sacred element symbolizing purification.

From the earliest times, man appears to have regarded water as a thing of mystery and to have attributed to it supernatural powers. It gave life to himself, animals and vegetables and was indeed a Divine essence as well as being the supreme cleanser.

The rivers and streams of the East, such as the Nile, the Euphrates, the Ganges and the Jordan, were, and are still, regarded as sacred. The Biblical injunction, "Go and wash seven times in Jordan," is thus an instance of water being employed as a Divine cleanser. It has been suggested that the rite of baptism may have had its origin in the idea of the purification by water, and the entrance into the Church being thus typified by water, hygiene and religion came together, and so cleanliness became regarded as next to godliness.

The association of the incantation with direct medical treatment was general in Babylonia and Assyria, and also to a large extent in ancient Egypt.

It is evident, from its geographical situation, that a far-reaching influence spread from Babylonia to the neighbouring countries where the caravan routes from India, Arabia and Syria met, and how a knowledge of drugs and their properties was also disseminated through the wandering nomadic tribes.

It is probable that, in this way, the knowledge of Babylonian medicine was carried into eastern Mesopotamia and so penetrated into Assyria.

Many of the plants and herbs mentioned on the Assyrian tablets are Sumerian, and evidence is found

of similar influence and intercourse between Babylonia and Egypt.

Judging from a Babylonian record which is believed to date from 2250 B.C., there was trade in drugs between that country and Egypt at that period. This tablet purports to be an order given by a dealer in drugs and has been translated as follows :

"10 Shekels of Cypress oil. 3 Shekels of oil of Myrrh. 5 Shekels of oil of Cedar. To be obtained from abroad."

From another tablet of the same period it would appear that the drug dealers of Sippura at that time had their stalls or shops together in one street.

Our knowledge of the preparations employed in medicine by the Babylonians and Assyrians is chiefly derived from the great library of clay tablets that was discovered in the palace of Assur-banipal, King of Assyria, who ruled Nineveh from 668 to 626 B.C.

About eight hundred fragments of these consist of medical texts, mainly of Babylonian origin; and, as these are copies of much earlier records, we have in them the accumulated experience of many previous generations which probably revert to a period between 2000 and 3000 B.C.

About 250 drugs of vegetable origin are mentioned and 120 mineral substances. Of the former still in use may be mentioned asafœtida, henbane, chamomile, fennel, calendula, sagapentum, storax, myrrh, almond oil, saffron, liquorice root, lupin, pomegranate, poppy, mandrake, turmeric and many others equally well known.

Among the chemical substances are alum, arsenic

(sulphide), sulphur, cinnabar, verdigris, lime and Akkadian salt (probably rock salt).

Medical treatment in Babylonia appears to have been of a more primitive type and probably dates from an earlier period than that found in Egypt.

Some of the Babylonian medical texts, transcribed by R. Campbell Thompson, reveal the earliest known methods employed in preparing medicines and are the first recorded accounts of the art of the apothecary.[1]

Thus a poultice, one of the first forms of medication alluded to, is directed to be made with rotten grain and water, on which the patient is ordered to sit, to relieve pain in the muscles or joints resulting from rheumatism.

A poultice to be applied, " if a fever seizes a man and affects his eyes so that his vision is clouded," is described on another tablet. The directions are to " pound one-third of a ka of powdered siklu with Khaldappan stone and take one-third of a measure of it for the head that pains; knead with cassia juice, then wrap it round (the head) attach it (by means of a bandage) and for three days do not remove."

Mashed turnips kneaded with milk to a soft paste were also employed as a poultice. Simpler poultices of flour made into a paste with wine are also mentioned, and over a dozen formulæ are given for poultices to be applied to relieve pain or cramp in the stomach. These applications are generally directed to be kept in position by means of a bandage.

It is significant, that in connection with the instructions for preparing a remedy, directions are often given

[1] " Babylonian Medical Texts," transcribed by R. Campbell Thompson, M.A.

for its administration. Thus, "If a man is sick of a cold which has turned into stomach-pain let him compound . . ." Then follows a list of herbs and roots which are to be macerated in wine and the liquid to be drunk in the morning before food. This shows that the art of the apothecary had begun to be practised, and at that early period had reached a stage much in advance of the methods used by primitive man. The maceration of certain herbs in a liquid menstruum such as wine, was a common method of preparing medicines among the Babylonians, as instanced in the following text: "Place liquorice root, tarmush plant (probably bean), shilin (darnel), shi-man, tu-me, and tongue plants in wine, and allow it to stand for a certain period, then decant the liquid for use." The medicated wines of the pharmacopœias of the present day are sometimes prepared by the same process.

On another tablet directions are given for compounding salt with water, which the patient is instructed to drink *without* food, "and he will recover," which indicates a knowledge of making a solution and its administration as a remedy on an empty stomach.

The "salt of amanu" frequently mentioned in Babylonian texts is thought to have been ammonium chloride, which was probably brought from Egypt.

The juices expressed from fresh herbaceous plants are often directed to be mixed with wine, probably with the idea of making them more palatable, as well as acting as a preservative.

An embrocation for rubbing on the body is another form of application frequently mentioned in the tablets. "For headache on the right side with a swelling in the

right eye and abundant flow of tears," an embrocation composed of finely powdered human bones mixed with oil of cedar is prescribed, and there is also mention of lotions for the eyes, which usually consist of some alkaline salt dissolved in water.

The employment of the clyster or enema by the Babylonians, Egyptians and Hindus appears to have arisen from the belief that the act of injection actually involved driving the demon of disease out of the body.

It is interesting to note, that the medium employed is often directed to be not only injected, but to be given also by the mouth, and the whole body to be afterwards sprinkled with it, as instanced in the following text: "Mix rock-salt and ammonia with unmixed wine. Let him take it without food through his mouth as well as by his anus, and sprinkle him with it and he will recover."

Enemas are directed to be given with warm or cold water, and the addition of certain oils and honey clearly shows, that the aim was to soothe the inflamed and irritated muscles, as well as to act as a lubricant to the bowel. Thus directions are given to prepare an enema of oil and introduce it into the anus, "then the stomach will again retain food and drink and the patient will recover."

On a Babylonian tablet of a later date a recipe is given for a man suffering from colic. In this a notable advance is made in the method of preparation which points to a practical knowledge of pharmacy. To cure the patient, it is directed to take "cedar bark, juniper bark, sweet reed (something like sugar-cane), balliku-herb, myrtle, khaldapannu (oleander), chop up these six substances, add wine, heat the mixture, pour it off, add honey and refined oil; let it cool and rub on the stomach or

pour on the anus." From the directions given for preparation it will be seen, that the chopped ingredients are first to be macerated in a warm alcoholic medium to exhaust their properties. After decanting, the oil and honey are to be added, thus forming a semi-liquid embrocation suitable for application as directed; the addition of the oil no doubt acted beneficially as an emollient.

Plasters are also referred to in the tablets, and were made by mixing drugs into a paste, then smearing them on a cloth or piece of leather for application to some part of the body.

From one of the early Babylonian tablets discovered at Nippa, which dates from the kings of the first Babylonian dynasty 2000 years B.C., there are particulars of a school of healing at Eridu. Here we have mention of a wise man called Pir-Napistum who is called in to relieve the affliction of Gilgamis. The sage does not undertake the cure himself but delegates it to his wife, a fact which points to the existence in Eridu of the healing priestesses or wise women; she prescribes a poultice which was first to be used as an application and later to be *eaten* by the patient. The tablet states :

" The affliction of the man is ever in thy sight.
Cook the vegetable food (a mess of vegetables),
And place it on his head.
She cooked the food and placed it on his head.
She boiled the herbs.
She moistened it.
She made bright his bowl, then added the shiba plant.
She boiled the mess of magic food.
Suddenly the man awoke and ate the magic food."

The demoniac origin of disease, or what was picturesquely called by the Babylonians "the hand of the ghost," is very pronounced in many of the medical texts and in this case magic is also brought into play.

Many allusions are made to the plague-demon who is supposed to have inflicted mankind with that scourge. He is directed to be driven from the sufferer by means of fumigations.

One tablet is particularly interesting, as the text shows that natural fermentation was known as early as 2,500 years B.C. It describes an application that is to be made, by allowing the crushed seed of the dog's tongue (cynoglossum) and some of its leaves to ferment in a closed pot until it rises, then mixing it with a salt of copper.

A summary of the medical texts shows that as early as 600 years B.C., the Babylonians employed the following preparations: infusions, decoctions, medicated wines, poultices, embrocations, electuaries (made with honey), solutions, ointments, plasters, lotions, enemas and fumigations, made by either burning some substance or heating it, so as to allow the fumes given off to reach the part of the patient affected.

This list proves, that the art of the apothecary had made considerable progress since the time of primitive man.

CHAPTER II

THE ART OF THE APOTHECARY AMONG THE ANCIENT EGYPTIANS—THE "APOTHECARY OF THE GODS"—THE ART OF THE APOTHECARY AMONG THE HEBREWS, HINDUS AND CHINESE

ACCORDING to Sir E. A. Wallis Budge, the Egyptians believed that the gods transmitted the knowledge of plants and their medicinal properties to their priests for the benefit of their worshippers, for many of the gods themselves, like Osiris, were skilled in the art of healing.[1] Thoth, who was the great and powerful physician, was also the originator of science and author of the forty-two sacred books, the last six of which dealt with medicine. These were kept in the famous Temple of Thebes, where as far back as 3000 B.C. the art of healing was taught, together with other branches of science.

Anepu, whom the Greeks called Anubis, he tells us, may be regarded as the apothecary of the gods of Egypt, for he was the keeper of the house of medicines and the chamber of embalmment. The Egyptians possessed books on medicine in the first half of the fourth millennium before Christ; and, even then, Anubis was regarded as the "Apothecary and the Compounder of prescriptions for the gods."

[1] "The Divine Origin of the craft of the Herbalist," Sir E. A. Wallis Budge. London, 1928.

There was an interesting and curious association of the early Egyptian gods with vegetable substances; thus the vegetable oils were thought to be effluxes from the body of Ra which had taken the form of trees, such as the olive, acacia and palm. The tears that fell from the eyes of Horus turned into the gum Anti (myrrh), the blood that fell from the nose of Gebban was transformed into cedar trees, and the sweat of Isis and Nephthys turned into plants.

These plants and oils were regarded as important medicines and were also used in ceremonial rites.

The Egyptians had several centres of learning; thus at Heliopolis, where dwelt the Priests of the Sun, there was a school of applied medicine, and similar institutions existed at Memphis, Säis and Chennu. Hither, in the later period of Egypt's glory, between 600 and 400 B.C., came Plato, who graduated at Heliopolis; Pythagoras, the disciple of Sonchês, the Egyptian archprophet; Eudoxus, and other Greek sages, to study the wisdom of the Egyptians.

As civilization advanced, so the knowledge of substances reputed to possess curative properties largely increased and began to be recorded. Formulæ and recipes that had proved effective in the treatment of disease were collected together, and so originated many of the early documents on the art of healing that have come down to us through the ages.

Some of these ancient records in the form of papyri discovered in Egypt are extant to-day, and to these we owe our knowledge of the drugs and preparations employed in that country over three thousand years ago.

ANEPU

'APOTHECARY TO THE GODS OF ANCIENT EGYPT'

From a bronze statuette, ca. 500 B C., in the British Museum

The papyri dealing with medicine have been so frequently described, it is only necessary for us to give but a brief summary of those which serve to illustrate the art of the apothecary as practised by the Egyptians.

The earliest known papyrus of medical interest was discovered at Kahun in 1889 near the pyramid of Illahun, among the ruins of an ancient town which had been apparently inhabited by the builders of the pyramids. It is said to date from about 1850 years before Christ, and includes several prescriptions for medical treatment, the ingredients of which consist mostly of herbs, dates, onions, beer, milk, oil and honey.

The most important of the early Egyptian documents on medicine, however, is the Papyrus Ebers, which is supposed to have been written about 1500 B.C., and is believed to be a copy of a much earlier work, probably one of the sacred books of medicine. Many of the recipes it contains are supposed to have come down from a period of remote antiquity. From this papyrus our knowledge of the materia medica and skill of the early Egyptians in the art of the apothecary is mostly derived.

About seven hundred different substances from the animal, vegetable and mineral kingdoms are mentioned. They include such well-known drugs as aloes, coriander, cummin, castor-oil, fœnugreek, myrrh, juniper, opium, leek, celery, henbane, turpentine, mandragora, pomegranate, squill, peppermint, antimony, sodium carbonate, honey, dates, figs, and many other substances. The preparations described for internal use include decoctions, infusions, pills, confections, boluses, draughts, cakes, lozenges, powders, and inhalations; and, for

external use, plasters, poultices, ointments, fumigations, embrocations, lotions, also plugs for the anus, and suppositories.

From a review of the substances mentioned it is apparent, that the ancient Egyptians recognized the properties of substances which acted especially as emetics and aperients, as well as those that increased the secretion of the kidneys.

In some of the recipes efforts have apparently been made to disguise the nauseous flavour of certain drugs, and to render their administration more palatable, which proves that the art of the apothecary was cultivated in Egypt some two thousand years before the Christian era. Many of the prescriptions have a similar form to those of the present day, and consist of a basis, adjuvant, vehicle and corrective. The quantities are regulated exactly, the same ingredients appearing with surprising regularity in identical dosage, whilst the weights of the drugs stand in the relation of 1 : 2 : 4 : 8 : 16 : 32 (dual system of weights).

In a recipe for an eye-salve, given in the Papyrus Ebers, there is an interesting reference to the " Priestly pharmaceutist," from which it may be inferred there were men who had a special knowledge of the art of the apothecary and who prepared certain medicines.

It is in the Bible that we find the first definite mention of the apothecary and his art.

From our present knowledge of the healing art as practised by the Hebrews in early times, it would appear that the Israelitish priest did not profess to practise

medicine, but there is evidence that the physicians and apothecaries were distinct classes. Thus in the Book of Chronicles [1] it is recorded, that when Asa was exceedingly ill, with a disease in his foot, "he sought not to the Lord but to the physicians." In Nehemiah [2] there is mention of one "Hananiah, the son of the apothecary," who is thought by experts to have been a man who belonged to a guild of apothecaries. This would appear to favour the conjecture that the physician and the apothecary were separate callings.

Ointments and confections seem to have been the chief forms of preparation used by the Hebrews, and several references are made to the art of the apothecary in the Old Testament.

In Exodus [3] a recipe for an anointing oil is given, thus: "Take thou also unto thee principal spices, of pure myrrh five hundred shekels, and of sweet cinnamon half so much, even two hundred and fifty shekels, and of sweet calamus two hundred and fifty shekels, and of cassia five hundred shekels, after the shekel of the sanctuary, and of olive oil an hin: and thou shalt make it an oil of holy ointment, an ointment compound after the art of the apothecary; it shall be an holy anointing oil."

In another verse we find: "And thou shalt make it a perfume, a confection after the art of the apothecary, tempered together, pure and holy." [4]

When the Babylonian king sent to the ruler in Jerusalem a present on his restoration to health, Hezekiah exhibited to the courtier Berodachbaladan, his precious spices, and his precious ointments.[5]

[1] 2 Chron. xvi. 12. [2] Neh. iii. 8. [3] Exodus xxx. 23–25.
[4] Exodus xxx. 35. [5] 2 Kings xx. 13.

Another allusion is made to the apothecary's art as follows: "Dead flies cause the ointment of the apothecary to send forth a stinking savour." [1]

In the Apochryphal book of Sirach, written about 200 B.C., in the thirty-eighth chapter, occurs the follow-

DANIEL AS AN APOTHECARY DESTROYING THE DRAGON
(From a drawing in an English manuscript of the XIV century.)

ing passage: "The Lord hath created medicines out of the earth; and he that is wise will not abhor them. Was not the water made sweet with wood that the virtue thereof may be known? And he hath given skill that he might be known in his marvellous works. With such it is he healeth men and taketh away their

[1] Ecclesiastes x. 1.

pains. In such doth the apothecary make continuation, and of his works there is no end." The knowledge of the apothecary is here distinctly mentioned and defined, and cannot well be disregarded. It is evident that the apothecary's art was highly thought of in those days.

Some of their ointments, the formulæ for which were probably adopted from the Egyptians, contained extremely valuable ingredients, for which alabaster vessels and pots were used as containers. The incident of the box of precious ointment (spikenard) related by St. Mark shows that the Jews had adopted this practice.

The source of spikenard (*Nardostachys Jatamansi*), so historically interesting, has been traced to the " jatama " of the Hindus. There was extracted from this plant an oil of great and lasting fragrance, similar to attar of roses. The " jatamansi " is a species of valerian that grows among the Himalayas, and is still used by the Brahmins in the sacred rites associated with the sacrifices.

In the Talmud several references are made to the drugs used by the ancient Hebrews. Wine mixed with pepper is recommended for stomach troubles, the onion for worms, and an injection of turpentine for stone in the bladder.

The Aryan races that inhabited the north-west parts of India appear to have had a knowledge of drugs from a very early period, and it is probably here that we may look for the cradle of the medical art.

The discoveries of Sir Aurel Stein of manuscripts of great antiquity in eastern Turkestan show that there was an early civilization in that region, centuries before the Christian era, into which Indian influence largely entered. Some are written in the Kharoshthī characters of North-

West India. Others are inscribed on wooden tablets, and among them is a medical work in the Khotanese language written in Gupta script, that was found in the " Caves of the Thousand Buddhas."

Another appears to be part of a prescription of the Chin period, a fragment of which reads :

" In case of abdominal trouble, if the child is one year old, he must be given one of the pills to swallow in the form of a draught. For a child of two years, the dose is three pills . . . seven pills; if no result follows, the dose may be gradually increased up to ten pills."

Another interesting manuscript he discovered was a Turki book written in Runic script on Chinese paper, which appears to have been a record of oracles and probably belonged to a soothsayer.

The ancient Hindus had an interesting and beautiful tradition as to the origin of the remedial properties of plants and herbs. They believed that at some remote period the animals, birds, fishes and insects, incensed at their slaughter by the human intruders and that they should be killed for their use, took counsel together and unanimously decided to make war upon the human race. The assembly of creatures then began to devise various diseases to afflict mankind, but the plants and herbs who were friendly to man, heard what had been done by the animals and determined to frustrate their evil designs. Every tree, shrub and herb, even down to the grasses, agreed to furnish a remedy for some one of the diseases, and each said, " I shall appear to help man when he calls upon me in his need." Thus did medicine originate, and when the physician is in doubt

what treatment to apply for the relief of a sick person, the spirit of the plant suggests to him the proper remedy.

Susruta and Charaka, the earliest exponents of Hindu medicine, probably flourished between 800 and 600 B.C. Their works are still extant in the Vedas, the sacred writings, which are said to have originated between 4500 and 2500 B.C. They are believed to have been preserved by oral tradition for many centuries, and in them are many allusions to medication. Charaka's work, which is mainly on medicine, contains 120 chapters in which he describes, among other diseases, leprosy, epilepsy, tuberculosis and fevers. His materia medica largely consisted of animal and mineral substances, and there is mention of gold and silver, arsenic sulphide, iron, lead and antimony as being used in medicine. Aconite, black pepper, burnt alum, stramonium and sulphur are also recommended as remedial agents. A curious survival of the tradition already mentioned of man's debt to plant life occurs in some of the hymns and prayers to plants and other medicinal substances mentioned in the Atharva-Veda, as instanced in the following quotation: "The fever that comes on every third day, that intermits on every third day, that comes continually and that comes in Autumn, fever that is cold and hot and that comes in Summer—destroy him, oh Plant!" What better description could we have of a tertian fever than this, which probably dates from three to four thousand years before the Christian era?

The early Hindu physicians knew of the enema syringe, which they made from the scrotum of a deer, goat or ox with a tube of bamboo, ivory or horn. With it they used medicated oils or waters. They employed

asses' milk in phthisis, tiger's fat in rheumatism, garlic in bronchitis, sulphur in skin troubles, and appreciated the value of sunlight in the treatment of disease.

Further east, there seems little doubt that medication in China dates back to a period of over 2,000 years before the Christian era. The traditionary Chen-hung, who is said to have flourished between 2737 and 2697 B.C., left a work on materia medica containing 260 recipes for which he collected the necessary herbs himself. He was followed by Sin-llong, the second Emperor of the dynasty of the "Five Rulers," who was born about 2685 B.C., and is said to have been the first to have tested the action and use of different drugs on himself and recorded their effects.

The Emperor Huang-ti, who followed, collected all the scattered works on medicine into an Encyclopædia. Among later works the most celebrated is the *Pen-tsao*, a vast treatise on herbs in many volumes, by Lischitschin (Tang dynasty, A.D. 618–907), which contains 11,886 recipes.

The Chinese classified all diseases as hot or cold, and the actions and uses of different drugs were considered accordingly.

The heating drugs were to be gathered during the day-time in summer, when the weather was hot, and were to be prepared by the aid of fire, either by heating or boiling. The cooling drugs were to be gathered by night during winter, and then soaked in water. "Medicine," says Dr. Tee Han Kee, "is usually prescribed in the form of decoction, but pills, powders and other forms of administration are also used."

Some of the drugs employed in ancient times are used

to-day, and among those commonly prescribed are ginseng, gentian, orange bark, dragon's bones, almonds, rhubarb, mercury, chrysanthemum, dog's testicles, cockroaches, sulphur, deer's horns, spiders, urine, and milk.

Although the Chinese knew of inoculation for smallpox from an early period, the use of mercury as a remedial agent, and the moxa, the practice of medicine retrograded. They never seem to have adopted Western methods like the Japanese; and, instead of progressing, their ideas of medicine degenerated into a mixture of superstition and quackery.

CHAPTER III

THE ART OF THE APOTHECARY AMONG THE GREEKS AND ROMANS

RETRACING our way westward we find that in the early days of Greece, the healing art as practised in the temples of Asklepios chiefly took the form of invocation and incubation or healing by suggestion, and it was not until between 500 and 400 B.C. that Greek medicine developed to an art, of which Hippocrates was the founder and leading exponent.

At this period there were apparently two distinct classes who collected and sold drugs in Greece, who were called respectively, rhizotomists and pharmacopolists. The former gathered the roots and herbs and expressed the juices of plants for remedial purposes, while the latter dealt in drugs and medicinal substances which they sold in their booths on the public market-places.

The pharmacopolists, who did not possess booths, employed screens or sheets to protect their drugs and aromatics from the sun, as it was not until about 200 B.C. that covered markets were built in Athens.

Theophrastos (370–285 B.C.), in his "Natural History of Plants," lays stress on the care that should be given by the rhizotomists to the preservation of their drugs, and Dioscorides also remarks on the necessity of taking great care in the gathering and storing of each remedy

and the time most suitable for it, " for on this," he says, " depends whether the medicine retains or loses its efficacy."

The methods of preserving drugs and other substances used for medicinal purposes were also regarded as a matter of great importance, and one to which careful attention should be paid.

The Greeks employed vessels of clay, alabaster and lead for solid substances, and used silver, glass, horn and non-porous earthenware containers for their liquids. Fats and pulps are recommended to be kept in tin boxes, and receptacles of other metals were used for eye-salves. Natron or native carbonate of soda was stored in jars sealed with pitch, while aromatic gums, such as myrrh and labdanum, were preserved in tubes or little bags of goatskin.

The more precious salves, ointments and solid perfumes were kept in boxes of alabaster, while those of inferior quality were placed in goatskin tubes.

Dioscorides recommends dry boxes made of lime-wood for keeping flowers, leaves, seeds and aromatic substances.

Besides the rhizotomists, there were the cultivators of herbs and plants for medicinal purposes, and those who collected the juices and saps, which they carried out by making a slit or cut in the stem, and collecting the liquid in vessels. The country people who gathered the roots were often influenced in their work by the superstitions connected with plants, such as the belief that demons sometimes resided in the roots. Thus certain rites and ceremonies, as in the case of the mandrake, had to be performed before taking them from the ground.

The early Greek physicians probably prepared their own remedies when they required them, but according to the treatment of disease followed by Hippocrates (400 B.C.), greater importance was attributed to diet than to drugs. Throughout his works he alludes to two hundred and sixty different drugs, including white hellebore, which he used as a purgative, the seeds of amanta cretensis, the root of thapsia, the seeds of the daphne laureola, and the flowers and seeds of the cherthamis or bastard saffron. Asses' milk, the juice of the herb mercuralis, the leaves of the elder, or a decoction of beetroot with salt and honey, were used as aperients.

Hippocrates also employed clysters and suppositories. He used the leek, onion, wild parsley with wine and honey largely diluted, or sometimes a warm bath as a diuretic. Cantharides he prescribed in dropsy, and as an expectorant he gave copious drinks prepared from groats assimilated with oxymel, a mixture of honey and vinegar.

Other drugs used by Hippocrates, still employed in medicine, are aniseed, bryony, cardamoms, castoreum, cinnamon, colocynth, elaterium, galbanum, hemlock, juniper, squill, scammony, myrrh, sulphur and nitre. The Romans adopted most of their customs from the Greeks and from them largely drew their ideas regarding medication.

We are told that the physicians of ancient Rome collected their own drugs and regarded their selection and preparation as one of their most important duties.

Their remedies were sometimes stamped with the name of the drug, the diseases for which it was to be used, and instructions for administration. They had boxes and

bronze cases for their medicines, instruments, and scales and weights, some being elaborately decorated, several actual specimens of which were discovered at Pompeii. From accounts given by Roman historians it may be gathered, that the rarer the drug the more efficacious it was supposed to be. The gathering, preparation and vending of drugs and medicines were carried out by various classes. The dealers in drugs, who answered to the apothecary of later times, were called seplasiæ or seplasiarii, and dealt only in drugs, toilet preparations and the many varieties of unguents used in the daily bath.

In the latter days of the Roman Empire it is recorded that specially prepared formulæ, electuaries, eye-salves, lotions, plasters, poultices, cosmetics and wine were also sold by the seplasiarii.

This name is said to have been derived from *Seplasa*, a street in the town of Capua, which was almost entirely occupied by the shops of those who dealt in perfumery, pomades and ointments, the name being apparently transferred to Rome in the latter days of the Republic, before the Christian era. The seplasiarii, in the time of Pliny, sold their drugs to the physicians, but, later on, they appear to have become more or less independent and sold their medicines directly to the people.

Pliny, who had a poor opinion of the practitioners of medicine of his time, states that many of the physicians scarcely knew the names of the drugs they used, and trusted to the seplasiarii, "who always adulterate their medicines, sell old plasters and collyria and drugs spoiled by age."

Besides the seplasiarii there were the pigmentarii, who chiefly dealt in dyes and colours, but who also

apparently prepared medicines ordered by the physicians and sold them to the public. The pharmacopolists or herbalists who sold medicinal plants, who are said to have trespassed on the functions of surgeons in dressing wounds, formed another class, and at a later period mention is made of the dealers in aromatic gums and spices, who were known as aromatarii or confectionarii.

In the country generally, there were also the medicamentarii, who gathered the plants and roots and sold them to the physicians or the public for the preparation of simple remedies, and the pharmacotribæ, who ground spices and pounded drugs and made them ready for use.

Quacks and charlatans frequented the market-places and sold their nostrums and charms, much the same as their successors of the present day. These Chaldeans or Egyptians, as they were often called, are said to have travelled into Europe from the East and probably were scattered members of nomadic tribes who wandered over the country. Then there was the wise woman or "medica" who made and sold love-philtres, abortifacients, and carried on an illicit trade in poisons, of whose evil practices many instances are recorded.

The word *apotheca*, from which the word apothecary is derived, was first applied by the Romans to the upper part of a house in which the amphoræ for storing wine were kept. It was not, however, exclusively applied to the wine-chamber, but also to the store-room where the herbs and other vegetable products were preserved.

The name for any kind of shop in Rome where medicines and drugs formed the whole or part of the stock in trade was "medicina."

The prices obtained for certain drugs were very great

and it is stated that in Rome at the time of the Empire, five hundred grammes of balsam of Gilead cost approximately thirty-eight English pounds, the same quantity of spikenard, about three pounds sixteen shillings, and five hundred grammes of the oil of folia malabathri, about fifteen pounds.

As time went on the various trades associated with drugs developed in the markets. The vendors of aromatic gums and spices, many of which were largely used for sacrificial ceremonies and perfumes, became grouped together, and the seplasiarii and dealers in drugs had their shops, as may be found in the bazaars in Eastern countries to-day.

Those of the better class were away from the markets, as it is stated that in the Via Sacra near the Forum in Rome there were the shops of the unguentarii (perfumers), the pigmentarii, the jewellers and pearl merchants, the first-named often forming a fashionable meeting-place for the wealthy Romans.

The physicians, at a later period, began to prescribe foreign remedies brought from other countries, and passed their recipes or bills on to the seplasiarii, who kept the ingredients for making them in their shops. Thus, the custom of dispensing for the physician was gradually formed in Rome, and the separation of the practitioner who prescribed, and the drug-dealer or apothecary who prepared the medicine, came about. As evidence of this, Olympiodorus alludes to the physician prescribing and the pigmentarium, his assistant, preparing his recipes.

We owe our knowledge of the art of the apothecary in the time of the Roman Empire largely to the works of Aurelius Cornelius Celsus, who probably lived in

the period of Augustus, between 25 B.C. and 50 A.D. He is said to have been born in Rome and was the author of an important work on medicine in eight books. He states in his writings, that "every remedial agent applied to the body either abstracts some material from the body, calls it forth or represses it, cools or warms, or hardens or softens it," and that " the abstraction of material is effected by cupping, purging, gestation and other exercises of the body, by abstinence and by sweating," all of which were used by the Romans in the treatment of disease.

Among the preparations mentioned by Celsus for external application, are cataplasms or poultices made of flour, either of wheat, barley, millet, lentils or beans. These are directed to be boiled and then laid hot on the affected part.

The formulæ for plasters and troches he records are also numerous. These preparations were chiefly applied to wounds, while the malagmata, made of flour, coriander seeds, gums and wax, were used for unbroken surfaces to promote warmth and applied for diseases of the liver, spleen, abscesses and swellings of the joints.

The materials which entered into the composition of the plasters were required first to be carefully powdered. The plaster always contained something which required melting in its composition, while a troche was composed of dry substances mixed with some liquid. The plaster was made by first powdering the dry ingredients separately, then, after mixing, vinegar was to be added or some other non-greasy liquid. On this was poured oil or wax to bring it to a proper consistence, or sometimes the dry materials were boiled with the oil.

For troches or pastils the dry ingredients were directed to be rubbed together, then mixed with some liquid, such as wine or vinegar. On being brought to a proper consistence, the mass was left to dry, and when used, was to be moistened with some other liquid. The preparation was then rubbed on, or mixed with a cerate.

Vaginal pessaries were composed of fœnugreek, rose oil, saffron, and the yolk of egg as an emollient, while others were medicated with myrrh or elaterium. A piece of wool was impregnated with the mixed ingredients and introduced into the vagina. Bœthus is said to have been the inventor of the pessary made with a basis of fat and wax.

The Catapotia was a preparation generally composed of drugs having anodyne properties. The ingredients, which usually included mandrake, henbane seed, wild rue and opium, were first powdered and then beaten into a mass, a small piece of which, about the size of a bean, was swallowed like a pill.

Conserves, which were frequently used, were generally made with a basis of boiled honey.

Collyria formed an important class of preparation and were used for the eyes, for among the Romans diseases of the eyes seem to have been very prevalent. The formulæ were numerous, the active ingredients usually consisting of calcined copper, antimony and opium. In preparing them the drugs are directed to be first rubbed to a very fine powder, then starch, gum, the white of egg or milk added, and the whole made into a paste, but sometimes they were used also in liquid form. Their popularity is shown from the numerous formulæ of a proprietary kind to which the name of the originator

was attached. These are evidenced in the Roman oculists' seals that were used to stamp certain preparations in the form of collyria and ointments recommended for treatment of the eyes.

The Roman oculists' medicine seals or stamps which have been discovered from time to time, are quadrilateral objects generally made of green schist or steatite, and have inscriptions engraved on one or more of their sides, so that an impression could be made on the surface of the preparation after it had been placed in its container. They were also used to stamp the labels attached to liquid collyria. They often include the names of the physicians who originated them, a description of the formula, and the special disease for which they are recommended.

The term collyria was applied to both solid and liquid applications for the eye, some of which were known by the name of the oculist, others from the colour, or the name of some great personage whom the preparation may have cured.

Thus we learn from the inscription on a stamp excavated at Bath in 1731 that the "Golden-yellow Collyrium by T. Junianus for the clearness of vision" was sold to the citizens of the Roman colony on the Avon, 1,800 years ago.

"Chloron" is inscribed on another stamp discovered some sixty years ago at Winchester, on which appears the inscription "Chloron or green collyrium by T. F. Vindax Ariovistus." The active ingredient in this was calcined copper.

The Roman eye-physicians treated old cicatrices of the eyes with various collyria, their object being apparently

to change their colour and make them less noticeable. These they classified as "concave" or "elevated." If they were concave they would use the Collyrium of Sphærion or Asclepios, which was composed of labdanum, sagapentum, opoponax, verdigris, pepper, cadmium lead and gum. For the elevated type they recommended the Smilion Collyrium, which contained cinnamon, acacia, cadmium, saffron, myrrh, opium, gum, white pepper, frankincense and copper. A collyrium called Hierax was considered a very powerful application for affections of this kind. It consisted of myrrh, gum ammoniacum and verdigris.

Another collyrium mentioned by Celsus is that of Philo, which consisted of lead, spodium, gum and opium, while that of Dionysius contained dried opium, frankincense, gum and spodium. The formula of Nileus included opium, nard, gum, saffron and fresh rose-leaves, which were to be mixed with water.

One of the most popular of all is said to have been the collyrium of Cythion or Tephrion. This contained opium, lead oxide, acacia juice, gum, starch and tragacanth. The ingredients were directed to be rubbed together and a small quantity mixed with rain-water and applied to the eyes in all cases of inflammation or ophthalmia.

The Collyrium Dia-Libanou is recommended expressly for "ulcers generated from pustules." It was composed of calcined copper (carefully washed), and dried poppy-tears, spodium, frankincense, calcined antimony (carefully washed), myrrh and gum.

In some diseases of the eyes accompanied by headache, the forehead was anointed with the collyrium of Andreas,

which was composed of antimony and litharge, boiled together in rain-water. The ingredients were then to be mixed with gum and made into a paste with myrtle juice. This preparation is directed to be applied to the forehead, over which a starch poultice made with cold water (to which acacia juice or cypress had been added) was to be placed.

For the same complaint some physicians recommended that the eyes should be anointed with the Diakeratos Collyrium, which was composed of copper scales, poppy-tears, and hartshorn (calcined and washed), together with lead, frankincense and gum.

In certain cases of eye inflammation the Collyrium Cæsarian was recommended. This was composed of white pepper, poppy-tears, cadmia, washed antimony and gum. This collyrium, according to Celsus, is "admitted to be a proper remedy for all diseases of the eyes, except in those cases which require lenient applications."

A collyrium called Attalian was used for the same affection, but was only to be employed when there was excessive discharge. It contained castor, aloes, saffron, myrrh, lycium, prepared cadmia, antimony and acacia juice. As this contained no gum, it was to be kept liquid in a small box. Lycium is mentioned by Dioscorides, Pliny and Galen and many other early writers, and for some time puzzled all commentators as to its origin. It was held in great esteem by both the Greeks and Romans. Little vases are extant which were made specially to hold Lycium and were inscribed not only with the name of the drug, but also with that of the person who was probably the seller or maker of the

preparation. The Lycium of Jason, the Lycium of Heraclius, and other names have been found on these vases. Lycium is mentioned among the Indian drugs on which duty was levied at the Roman Custom House by Alexander, A.D. 176, and from further investigations made by Royle there is little doubt, that the Indian Lycium of the ancients consisted of an extract prepared from the wood or root of a species of berberis, grown in Northern India. It was well known in the bazaars as "Rusot" or "Rasot," and was commonly used among the Hindus for various eye diseases.

The word Basilicon, which is perpetuated in an ointment, was applied to a collyrium used by the Roman oculists, which was composed of poppy-tears, lead, Assian stone, white pepper, saffron, psoricum and gum. Psoricum was made by rubbing together a little chalcitis and cadmia with vinegar. It was then put inside an earthen vessel, covered over with fig-leaves and deposited under ground. After twenty days these substances were taken up and bruised again and were known as Psoricum. The Basilicon Collyrium was considered to be "a proper remedy for all affections of the eyes which did not require mild medicines."

Diseases of the ears were usually treated by dropping in oils or by the application of a cataplasm, and the expressed juice of henbane was employed to relieve pain. For inflammatory conditions of the throat and tonsils, gargles made with alum, frankincense, myrrh and other astringents were employed.

In Rome until the time of Augustus, practitioners of medicine were held in so little repute that no medical man was allowed the privileges of citizenship. It was

not until Antonius Musa succeeded in curing Augustus of a disease from which he suffered, that he was rewarded with the "right of citizenship, exempted from the public taxes, presented with a large fee, and given a gold ring to wear and his statue was placed alongside that of Æsculapius." From this period the medical practitioner appears to have been admitted as a citizen and given the same privileges as the equites.

CHAPTER IV

THE OLDEST REMEDIES IN THE WORLD

I. Holy Bitter (*Hiera Picra*); II. Sacred Sealed Earth (*Terra Sigillata*); III. Treacle (*Theriaca*)

I. Holy Bitter

THERE were three great historic remedies employed by the physicians of ancient Greece which have survived for over two thousand years. They are Hiera Picra or Holy Bitter, Terra Sigillata or the Sacred Sealed Earth from the island of Lemnos, and Theriaca, or the Treacle, for which there were many formulæ.

The Hiera and Theriaca have ever been intimately associated with the art of the apothecary and for centuries have taken a prominent place in the great books on medicine.

In Turkey and the Near East, Terra Sigillata is still prescribed and taken in certain ailments, Theriaca is yet in demand in the pharmacies of Italy, and Hiera Picra still holds a place as a domestic remedy in Western Europe, and is sold in the pharmacies of Great Britain to-day, as it was in Rome, Alexandria and Damascus, centuries before the Christian era.

Although, like Theriaca, the composition of Hiera Picra has varied considerably in the course of time, aloes and canella have been the predominating and

active ingredients in the compound from the time of its origin.

The name of the inventor of this ancient preparation is unknown; but, according to tradition, it was used as a remedy in some of the Temples of Asklepios in ancient Greece. The name Hiera Picra, which means "Holy Bitter," gives some support to the theory of its temple origin.

"Hiera" appears to have been used as a generic term by the early Greek physicians, who apparently altered and added ingredients to the formula as they wished, and sometimes attached their own name to the compound as a kind of proprietary medicine. Thus, in course of time, the formulæ for Hiera Picra multiplied greatly. The name also became corrupted and in the Middle Ages it is alluded to in manuscripts as "Hygry Pigry," "Gira Pigra," "Iera Pigre," and later it was corrupted to "Hickery Pickery," "Hickey Pickey," and other strange variants, by some of which it is known and demanded in country places in England at the present time.

The earliest formula recorded is that of Themison of Laodicea in Syria, a physician who practised in Rome about 43 B.C. His formula was as follows:

Aloes 100 drachms, mastic, saffron, Indian nard, carpobalsam, and asarum, of each an ounce, mixed together.

Owing to the nauseous taste of the powder and the difficulty in rendering it palatable, it was generally kept in the form of "species," which were preparations of compound powders kept ready for mixing with treacle or honey and so made into an electuary or bolus.

A Hiera which was held in great esteem in the first century was that originated by Pachius. Scribonius Largus, physician to the Emperor Tiberius A.D. 52, relates that this medicine was in such great demand in his time that large sums of money were offered to the originator for the formula. Pachius had kept his recipe a secret, and when he died at Antioch, the Emperor had his library searched to see if the true formula for the famous medicine could be found. It was eventually discovered in a manuscript which Pachius had dedicated to the Emperor. Tiberius, on its discovery, handed the formula to Scribonius with instructions that it should be preserved and afterwards published. According to Scribonius it consisted of:

"Colocynth, agaric, germander, white horehound, Arabian stoeches (a kind of lavender), of each 10 ozs.; opoponax, sagapenum, parsley seeds, round birthwort root, white pepper, of each 5 ozs.; spikenard, cinnamon, myrrh and saffron, of each 4 ozs. To be made into an electuary with despumated honey, 3 lbs. 3 ozs. and 5 drachms."

This formula is peculiar because it contains no aloes; colocynth apparently being used in its place. It was afterwards known as Hiera Pachius or Hiera Scribonius Largus, also as Hiera Diacolocynthidis, and was included in many pharmacopœias down to the eighteenth century.

Another famous Hiera was known as the "Great Hiera Leghudhaya," which consisted of thirty-three ingredients, including aloes, colocynth, scammony, cassia, cinnamon, black hellebore, myrrh, and gentian. It

appears to have been used as a kind of general remedy for all diseases.

The Hiera of Archigenes (A.D. 100) was recommended for vertigo, leprosy, elephantiasis, epilepsy and many other diseases. It consisted of twenty-three ingredients, the chief being aloes, colocynth, hellebore, scammony, pepper, gentian, opoponax, gum ammoniac, cinnamon, myrrh, marjoram, fennel, etc.

Another popular formula was that of Theodoretus *ca.* A.D. 110, which was recommended for "all sicknesses which are protracted, obstinate fevers, disorders of the liver, of the spleen and kidneys." This Hiera was composed of twenty-five ingredients and was made into an electuary with honey. It consisted of more than half of aloes, mixed with rhubarb, saffron, orris root, colocynth, cinnamon, pepper, scammony and gentian.

Galen (A.D. 130) was a firm believer in the efficacy of Hiera Picra and originated a formula of his own which was known as the "Great Hiera Galeni." He was the first to simplify it, and his recipe consisted of Socotrine aloes 100 parts; cinnamon or canella, spikenard, xylobalsam, mastic, asarum and saffron, of each 6 parts, and sufficient honey to make it into an electuary.

There was also the famous Hiera originated by Alexander of Tralles about A.D. 550. He re-introduced scammony into the compound, with the object, he says, "that it should not be carried immediately through the system, but detained in the body and conveyed to the remote parts so as to correct the various humours, open the passages, and remove the obstructions of the nerves, and make way for the motion of the spirits." This formula survived until the eighteenth century, and was

included in the London Pharmacopœia of 1724 under the name of " Hiera Diacolocynthidis."

Other formulæ which have come down to us from Early times are: the Hiera of Logadius, which consisted of twenty-nine ingredients, including euphorbium, myrrh, centaury and squill. There were also the Hiera Rufus, and the Hiera Justus, the composition of which do not vary materially.

As time went on, the formulæ became more complicated, and several physicians sought to improve the preparation by adding new ingredients.

In the early and Middle Ages, the diseases and ailments for which Hiera Picra was recommended appear to be innumerable, and it seems to have been administered as a general panacea for every ill, from leprosy and elephantiasis to diseases of the liver, spleen and stomach. It was not until more recent times that it appears to have acquired a reputation as an emmenagogue and abortifacient.

It is interesting to note that the pill of myrrh and aloes of the British Pharmacopœia was adapted from the formula of the Hiera of Rufus of Ephesus, who lived in the reign of the Emperor Trajan (A.D. 50).

Hiera Rufus was apparently first made into pills by the Arabs which were for a long time known as " Pilulæ Pestilentiales," a name given to them by Avicenna. In the early editions of the Edinburgh Pharmacopœia they were called " Pilulæ Communes."

Before leaving the ancient Hieras, mention should be made of the Hiera of Nicholas Myrepsus (A.D. 1250), who lived at Nicæa and studied at Salerno, where he acquired eminence as a physician. It contained eighteen

ingredients, including colocynth, turpentine, absinth, turpeth mineral, and rose-leaves, and was administered in the form of an electuary or used as a clyster.

The Arab physicians also contributed largely to the formulæ for Hieræ, and from them we have the Hiera Mesué, Hiera Hermetis, Hiera Constantini and Hiera Rhazes, all differing in composition.

John Arderne of Newark refers to the use of hiera picra as a clyster in England in 1370, and states : " Old leeches ordered the costive clysters, and they put in cassia fistula, mirobalans, hiera picra and other laxatives, which clysters forsoothe made the patients more constipate than they were before." Later on it also entered into the composition of suppositories.

The first mention of this preparation in ancient English literature appears to be in the MS. Bursar's Roll, Durham, 1379, where it is alluded to as " Gira Pigra." In an MS. by Lanfranc written in 1400 it is termed " Iera Pigre." Hiera called " Pikra " is also mentioned in an MS. of the twelfth century, and the formula is given as follows :

" Aloes 12 drachms, mastic, saffron, bearded grain, cassia, wild spikenard (hazelwort), berries of the balsam tree, and cinnamon, of each 6 drachms, to be pounded and kept in a dried powder; 4 drachms being taken as a dose with honey and hot water." It was recommended for all ailments of the stomach and head.

In some of the early manuscripts on medicine it is noticeable that the word " Pikra " is applied to a simple extract of aloes.

Coming to the era of printing and the publication of the earliest formularies and pharmacopœias, we find in

the "Luminara Majius" by Manillius, Venice, 1496, seven different formulæ given for the preparation, which include the Hiera Mesué, Hermetis, Diacoloquintidos and Constantinus.

The first official Pharmacopœia, the "Nuovo Receptario," printed in 1498, contains two formulæ for "Hyera Pighra," viz.: those of Nicholas Myrepsus and Logodion.

In the "Dispensatory" of Valerius Cordus, 1535, the formulæ for six Hieræ are given, including that of Rhazes, a simple and compound Hiera, and the recipes of Logodion and Pachius.

The Hieræ included in the London Pharmacopœia printed in 1627 were the Hiera Simplex of Galen, Hiera cum Agarico, Hiera Logadii (Nicholas Myrepsus) and Hiera Pachii or Diocolocynthidis of Alexander. They are directed to be kept in the form of species and were also used to make a tincture called "Tinctura Sacra."

In a recipe book of medicines dated 1675 there is a formula for making Hiera Picra, from which it would appear that at that time it was in demand in London as a domestic remedy. It is described as "Species Hiera Picra Opt.," and consisted of:

Aloes 6 lbs., Species Indic 4½ ozs., Rad. Asar 2½ ozs., Cinnamon 6 ozs., Mace ½ oz., Cochineal 1 drm., Croci pulv. 2 ozs.

Salmon, in 1678, says that Hiera Picra is a "good thing to loosen the body and gently evacuate choller and other ill humours. It opens obstructions and purges thick phlegmatic humours. In affections of the Stomach, Mesenter, Liver, Womb, Head and Joints it is excellent. Dose, two to three drachms in Wormwood Rhenish Wine, with one drachm of Syrup of Mugwort com-

pound, at night on going to bed; so taken, it is said to provoke the Terms and cure the Green Sickness."

The formulæ mentioned disappeared from the London Pharmacopœia of 1721, and were succeeded by the Hiera Picra of aloes and canella alba, the formula for which, although not official, has survived and is in use at the present day.

In the London Pharmacopœia of 1788, Hiera Picra appears under the name of Pulv. Aloeticus, but in the index it is called "Olim Hiera Picra." This was the last reference to the medicament in the London Pharmacopœia under its original name.

The simple mixture of aloes with canella did not appear again, but gave place to a mixture of aloes and guaiacum, which was included in the London Pharmacopœia, down to 1851, when it finally disappeared.

The formula was officially recognized at a later date in the United States, and was included in the American Pharmacopœia as recently as 1870.

In connection with the use of Hiera Picra in modern times, in 1896 a person was charged in a London police court with unlawfully conveying a packet of Hiera Picra, "a powerful drug," into Holloway Gaol, the object for which did not transpire.

Hiera Picra is still commonly used in Belgium, especially in the country places, and is known under the name of "Mater Conserve," although in some localities it is still known by the ancient name of "Holy Bitter."

It is still sold in some parts of England in the form of pills, but a more curious form of the preparation common in Birmingham and district, where it is yet in demand as a popular remedy, are little sticks about three

inches long known as " Pickery Sticks." They are prepared by mixing the powder with syrup or other excipient into a stiff paste. It is then rolled on a pill machine and divided into pieces weighing a drachm, which are wrapped in paper. A small piece is bitten or broken off the stick and swallowed for a dose.

II. Sacred Sealed Earth (*Terra Sigillata*)

From about a century before the Christian era until the end of the eighteenth century, Terra Sigillata, or the sacred sealed earth from the island of Lemnos, enjoyed a great reputation, and was renowned throughout Europe for its remarkable medicinal properties. There is no record of its discoverer, but that it was in use in medicine before the time of Dioscorides, A.D. 40, is evident from the allusion to it in his work. " Lemnian earth," he states, " is found in certain caves of the island of Lemnos in some marshy land. The best quality is here selected and then mixed with goat's blood. The inhabitants of the island of Lemnos make the earth into lozenges, which they seal with the impression of a goat and call them goats' seals. It is an antidote against deadly poisons. If it be taken before the poison, it promotes vomiting and expels it. Against stings and bites of all poisonous animals it is also efficacious, and is beneficial in the treatment of dysentery."

Pliny alludes to this medicament about A.D. 100, and remarks on the high esteem in which it was held. He says, " It comes after cinnabar in importance. Both the earth and the island on which it is found were well known in antiquity. As a medicine it is much esteemed.

If rubbed under the eyes it moderates pain and watering from the same, and prevents the flow from the lachrymal ducts. In cases of hæmorrhage it should be administered in vinegar. It is used against complaints of the spleen and kidneys, copious menstruation, also against poisons, and wounds caused by serpents."

Galen, A.D. 131–201, appears to have been greatly interested in the "sealed earth" and its mysterious origin, and records in his work on the virtues of simples that, he visited the isle of Lemnos on two occasions in order to discover the true Lemnian earth, and to learn how it was prepared on the spot. From what he states, even in those early days Terra Sigillata had achieved a wide reputation and a high commercial value, and attempts were made to substitute for it other earths that were similar in appearance. In his time the Greeks, who then held the island, stamped or sealed the earth with a representation of Diana, one of the goddesses associated with healing, and the seal was regarded as sacred. He describes the true Lemnian earth as that which does not stain the hands when touched, as "rubrica." "This earth," he states, "comes from Lemnos, the island otherwise called Stalimenes, and is found close to a town called Hephestias on the top of a red-stained hill, barren of plants and which has the appearance of having been burnt. Three kinds of it are used: the first, that which is called sacred and which nobody but the priestess may touch; the second, that which might really be called 'rubrica' and which is often used by smiths and carpenters; and the third, which has cleansing properties and is used in removing stains from clothes and linen. Having read in Dios-

corides and other authors that Lemnian earth was mixed with goat's blood and that out of the mud that resulted the priestess formed the lozenges called Lemnii, I now ardently desired to see how the earth was mixed and to know the properties of the parts. I was pleased to sail to Lemnos and see the quantity of blood used in that earth. The hill from which the earth is taken has a burnt appearance, not only in colour but also because nothing whatever grows upon it. It was on this hill that during my stay a priestess came one day, and having spread some barley and corn upon the ground and having carried out a few other ceremonies customary in that country, she loaded a cart full of that earth. She carried it into the town and began preparing in the open air those well-famed 'Lemnian seals.' The earth was first treated with water, stirred, and then allowed to settle to free it from impurities. The supernatant liquid was then decanted, and the earth deposited was removed, freed from stones, and dried into a soft mass which was afterwards cut into tablets and stamped with the sacred seal of Diana. The priestess then placed the tablets in the shade, where they were allowed to remain until all moisture had evaporated and they had become hard and dry.

"I thought it right," continues Galen, "to inquire whether anyone recollected that earth ever being mixed with goat's blood. But this question was received with derision. I was given a book written in ancient times by one of that country, in which all the virtues and uses of the Lemnian earth are given. I was pleased to experiment with them and took away with me 20,000 of those seals. The person who gave me the book,

and who was one of the most important men of the island, used the medicament for many purposes, such as old ulcers which were slow in healing, and against bites of snakes and other animals. He advised me to administer the earth after and not before poisons. He stated that he had experimented with Terra Sigillata mixed with juniper as an emetic. I have used this in cases where people have been suspected of having eaten cantharides and sea-hare, and as soon as they had taken the potion composed of Lemnian earth they vomited everything, so that they escaped the consequences of these poisons although they had eaten of both. I do not know whether the potion made of juniper and Terra Sigillata has the same effects against deadly poisons, but that Hephestian affirmed it for a certainty, so much so that he said it cured those bitten by mad dogs, if taken with watered wine, and if applied externally to the wounded part with some very strong vinegar. He used it also for bites of all kinds of animals and applied it to the affected part on a leaf, which has the faculty of resisting putrefaction. We have tried it with success for malignant ulcers and plagues hard to cure. Thus when the ulcers are soft the Lemnian earth must be mixed with very strong vinegar and then applied."

Galen describes the difference between Lemnian earth and Armenian bole, and referring to the latter states :

"During the spread of a very severe and cruel plague some earth of very cleansing properties was brought to me. It came from Armenia, and was called by the person who gave it me *stone* and not earth. It crumbles up as lime does, and like the latter contains no sand."

So great was the demand for the famous Terra Sigillata of Lemnos from the thirteenth to the fourteenth

century that many other earths, for which similar properties were claimed, were exploited and recommended in the books on medicine of that period. Almost every country in Europe strove to find within its boundaries a source of supply of so valuable and profitable a commodity. Some of these rival medicaments acquired a considerable reputation, one of the most celebrated being Terra Sigillata Strigoniensis or Strigian earth, which was found in Silesia and for which remarkable properties were claimed. It was yellow in colour, and when made into tablets was impressed with a seal representing three mountains. It was also known as Axungia Solis, as it was supposed to contain particles of gold, being obtained from a pit in a disused gold mine. The properties of Strigian earth are described in a curious little work by Johannes Montanus printed in 1585, in which he records various tests which were made of its powers first on animals and afterwards on a man who had been made to swallow a considerable quantity of corrosive sublimate. The account of the latter test is so interesting that it may be quoted in detail. It reads as follows in the quaint language of the time :

" We Wolfgangus Earle of Hohenloe, Lorde of Langenburg, &c. Do openlie make knowen unto all men by these my Letters Testimoniall, that there came lately before me at Langenburg, my welbeloved friende Andreas Betholdus of Oschatz, and declared unto mee that he had a most excellent kinde of Terra Sigillata, which was not alonely of great force against sundrie diseases : but also a most undoubted remedy against all manner of venemous poisons, as had beene prooved by sundrie witnesses upon a great number of dogges,

which made me also desirous to see the triall of it. It happened at the same time, that one called Wendel Thumblardt was by our Lieuetenant of Langenburg for certaine fellonies imprisoned, who being examined by our Justices, confessed himself guilty of a great number of robberies: And therefore brought to the barre was condemned to bee hanged. Being yet deteined in prison, and coming to his eare that there was such a medicine, so soveraigne against sundrie sicknesses, and the most deadly poisons, has made humble request as well by his parents, as by other his friends, of which there were present no small number, desiring for the mercie of God, and respect of his poor life, that being thus condemned, hee might have given unto him the most deadly poison that might be devised, whereby a perfit triall might bee had of the worthines of this medicinable earth. And in this respect, not onely for this pittifull request of his: but also for the commoditie and benefite of all Christendome, (if so be the medicine proove answerable to the report) pardoning the offender, we graunted his life upon that condition. Therefore the day of the date of these presents, in the presence of our selfe, and our welbeloved Cosin the Countie George Friderick of Hohenloe, and Lord in Langenburg, and in the presence of all our Nobilitie and Commons, the said patient received a dram and a half of Mercurie Sublimate, mingled with Conserve of Roses, and immediately after it he drank a dram of the Terra Sigillata in olde wine. And albeit the poison did in the judgement of our learned Phisition George Pistor Doctor in Phisicke, and John Lutzen our Apothecarie, who were both by him all the while, extremely torment and vexe him: yet in the end the medicine prevailing overcame it, whereby the poore wretch was delivered, and being restored to his health was committed to his parents. Whereas therefore the foresaid Andrew Berthold, hath

humbly required to have our Letters Testimoniall for his farther credite, wee have thought good for the furtherance and advancement of the truth, to graunt him these our Letters, signed with our seale Manuell. Given at Langenburg the 25. of Januarie, in the yeare of our Lord. 1581."

Another variety of Terra Sigillata emanated from Malta, and was taken from the cave in which, according to tradition, St. Paul sheltered after he was shipwrecked. This was a white earth of a chalky nature which was made into large, thin disks of various shapes bearing the impress of St. Paul and the serpent, as it was considered particularly efficacious in cases of snake-bite. It was exploited by the Grand Masters of the Order of St. John, and cups and bowls made from the clay and impressed with their seal had the reputation of counteracting the effect of poison. Among other earths, mention should be made of Terra Samia from the island of Samos, Terra Sicula from Sicily, Terra Portugallica found in Portugal, which bore the impress of a rose, Terra Chia and Terra Cymolia, which were both white earths and considered of great value, and Terra Lignicensis, which was impressed with an eagle. The latter was also called Axungia Lunæ, as it was excavated in the neighbourhood of a silver mine and was supposed to contain a small proportion of that metal. Earths for which similar properties were claimed were also found in Bohemia, in Griffenstein, Velden, Blois and Laubach, an account of the latter having been left by Geilfus.

An earth excavated in the vicinity of Jerusalem called Terra Sigillata Hierosolymitanæ was also in great demand. It was white and bore the impress of a crucifix, the

symbol of the Jesuit Fathers. Valentin states that he possessed two specimens of these tablets among his rarities, one of which bore the impress of a crucifix and many crosses and was known as "Mary's milk." This earth was found in a cave near Bethlehem in which the Virgin Mary was supposed to have hidden with her child, and these tablets were prescribed in order to promote lacteal secretion.

A Terra Sigillata was prepared also in England, and according to Berlu there were two varieties, a red and a white, but he gives no description of the impress or seal. It is little wonder that Wirtzung, writing in 1598 on the subject, says: "Of more than twentie be things these Trociskes made. Wherefore we do leave them to the apothecaries. They be very much used, for most they be forcible against spitting of blood if the same be given with the water of Knotgrasse. They be also good against the bleeding at the nose if the same be annoynted on the forehead likewise for the bleeding of the pyles."

Although so many varieties of Terra Sigillata were known and used in the sixteenth century, a large number of false earths were also sold, and Thevet, writing in 1554, states: "The Jews adulterate it considerably when they sell it to people who have no knowledge of it."

About the year 1553 Pierre Belon, following the example of Galen, paid a visit to the isle of Lemnos with the express object of obtaining information as to the collection of the famous sacred earth. He states that the hill from which it was taken was in the neighbourhood of Kotchino. Here on the hillside he found two fountains, of which the one on the right side of

the ascent was perennial while that on the left dried up in summer. No trees grew upon it except a carob, an elder, and a willow, which overhung the perennial spring. The earth, he found, was dug from the upper part of the hill, and the ceremony took place on one day of the year only, namely, on the sixth day of August, in the presence of the Turkish governor of the island and a large concourse of people. It commenced with a Mass which was said by the Greek priests and monks in a little chapel at the foot of the hill, and on the conclusion of this they mounted the acclivity, and the soil leading to the particular vein of earth was removed. The entrance was so deep that from fifty to sixty men were required to clear it. When the true medicinal earth was reached the monks filled a number of sacks with it and handed it to the Turkish authorities, after which the soil which had been removed was again replaced. The greater part of the earth was dispatched to the Sultan at Constantinople, but some was sold to merchants on the spot, while those who took part in the digging were allowed to carry off a small quantity for their own private use. In no case, however, was anyone allowed to sell it until it had been sealed. Belon collected eighteen different kinds of tablets, many of which, he states, bore different impressions. This difference he attributed to the fact that each lord of the island of Lemnos was said to have a distinct seal. In addition there was no lack of counterfeiters, who falsified the seal so well that they made it resemble the original. According to the Greeks and Turks of his time the most ancient seal was about the size of the thumb and consisted of four letters. He describes the earth as being made into

small cakes of various shades and colours, the prevailing tone being a dull red. Some were soft and fatty, others were gritty when chewed and slightly bitter to the taste. He mentions one variety which was red in colour but mottled with spots of white earth, also a counterfeit which was coated with Armenian bole and sealed with two letters entwined. Another kind of seal he found in two shops only in Constantinople: this earth was sold for a higher price than the others and possessed an aromatic smell.

The fame of Terra Sigillata appears to have reached its height towards the end of the sixteenth century, when it is recorded that it was in such great request as an antidote to plague, dysentery and other disorders that ambassadors, on returning from Constantinople to their native countries, were accustomed to take supplies of it with them to present to distinguished men.

In the early part of the seventeenth century the island of Lemnos fell into the hands of the Venetians, but was regained for the Turks in 1657 by Mohammed Kiuprili, who regarded it as a victory of such importance that he sent a dispatch to Adrianople to inform the Sultan that he had "won back the island where the sealed earth was found."

An interesting account of Terra Sigillata was written in the seventeenth century by Pomet, who in his "History of Drugs" states: "The earth most esteemed is in little reddish cakes, the least sandy and the most astringent you can get. It is much used in medicine because of its astringent quality. The Lemnian earth is fatty, clayey, dry, soft and friable, yellow, white or reddish, and astringent to the taste. Choose your sealed earth

that is soft to the touch and which will cleave to the tongue. The Turks, who are the present masters of it, mix it with other earths of the same nature and, having kneaded them together with water, make them into little round cakes which they seal with the Grand Signor's seal to make them pay duty."

Valentin, writing a few years later on the sealed earths of Germany, remarks: "They are of a fatty, heavy and clayey nature, and are generally shaped into roundish disks, which have an earthy smell, and are red, yellow, brown or white. Of all the earths Terra Lemnia is the best, and is so highly appreciated that it is considered equivalent to gold." In his time, about 1704, the tablets were stamped with the Turkish emblem—a half-moon with three stars or other Turkish characters. The Sultan considered it of so much importance that they should not be taken out of the country that it was almost impossible to obtain them, excepting through a consul, to whom they were sometimes given. He describes a Terra Sigillata Turcica and a Terra Sigillata Arabica, both of which were impressed with Turkish characters and which were pinkish-grey or white.

Terra Sigillata is quoted in a list of drugs in "The Family Physician," by Gideon Harvey, printed in London in 1678, at 1*s.* 4*d.* per ounce. In a price-list of the State Apothecaries of Basel, printed in 1701, Terra Sigillata Silicia is quoted at 2 florins 6 pfennig per ounce, and Terra Sigillata Turcica at 3 florins 4 pfennig per ounce. According to another price-list of medicines sold by the apothecaries of Florence, dated 1761, Terra Lemnia was sold at 5 lire per ounce.

Having considered the history of this interesting

medicament some account of the extraordinary properties attributed to it may be mentioned. By the Greeks, in ancient times, it appears to have been chiefly used as a remedy for the bites and stings of venomous animals, pain and watering of the eyes, hæmorrhage, dysentery, diseases of the spleen and kidneys, and also as an antidote against deadly poisons. By some writers it is recommended in cases of spotted fever, and it was applied externally to promote the healing and prevent the putrefaction of wounds. By others it was frequently prescribed for scabies, gonorrhœa and dysentery.

Terra Sigillata has often been confused with Armenian bole, but there is evidence from the time of Galen down to that of Belon, that they were two distinct earths, and that the latter was only used as an adulterant of the former.

Terra Sigillata entered into the composition of many important preparations, and formed one of the ingredients in the Treacle of Andromachus. It also formed part of many other preparations, especially the class known as "alexipharmic powders," which were largely used and prescribed for fevers, small-pox, and pestilential diseases in the sixteenth and seventeenth centuries. Hungary powder, a famous preparation used in dysentery, contained Lemnian earth, syrup of quinces and plantain water. An electuary was also made from Terra Sigillata in conjunction with syrup of bearberries and conserve of roses. It entered into the composition of a magisterium, and an oil for application to the eyes which was included in many pharmacopœias. It was included in the "Pharmacopœia of the Royal College of Physicians of London," printed in 1618, among the ingredients in the

Treacle of Andromachus, and throughout the seventeenth and eighteenth centuries appears in most of the official books on medicine in Europe. As late as 1833 it was included in the "Pharmacopœia Universalis" of Jourdan as Terra Sigillata, Terra Lemnia, or Lemnian Bole, and is described as being met with in round, cylindrical or flat cakes, of a pale rose-colour, and bearing the stamp of some seal. It was also official in the pharmacopœias of Spain, Brunswick, Geneva and Wurtemberg. Probably its last appearance in any important work on pharmacy is in Grey's "Supplement to the Pharmacopœia," 1848. He states: "Terra Lemnia, Terra Sigillata, Lemnian Earth, or Sealed Earth, is a kind of bole originally brought from the island of Lemnos, and said to have been obtained from a hill where no plant grew. The Turks, who were formerly the principal dealers in it, made it into little flat, circular cakes, which were stamped with the impression of a seal, and the name Terra Sigillata, Sealed Earth, is applied to it in this state."

The last pilgrim to the "Isle of the Sacred Earth" was Tozer in 1890, who has given an interesting account of his visit to the site of origin of this famous medicament. On arriving at the place where it is obtained near Kotchino, he found the ground everywhere covered with turf, but otherwise devoid of vegetation. He states: "The cavity from which the 'sacred earth' is taken is an insignificant hole about 50 feet in circumference and 10 feet deep, the bottom of which is now entirely filled up with dry stalks of thistles. The 'sacred earth is found at a depth of 3 feet below this.' In the neighbourhood there is, however, another spot which

seems to have been excavated, and it is believed that the vein extends for some distance below the soil. The earth, however, is not the same as that which Galen and Belon describe, for while they speak of it as red in colour, the specimens shown to me resembled ordinary clay. Either the original vein has been exhausted or they no longer dig deep enough to reach it. As in Belon's time, it can only be dug on the 6th day of August, and unless this takes place before sunrise all its efficacy is said to be lost. It is also confidently believed in the island that when the ground is opened, the sacred earth wells up of its own accord, but when I questioned a local authority he replied much in the same way as Galen's auditors did to his inquiries about the admixture of goat's blood in the drug."

The account of the customs observed on the occasion, which continued in practice until five or six years ago, was as follows :

"On the appointed morning the Governor or his representative proceeded to the spot accompanied by the Mohammedan 'khodjas' and the Christian priests, both of whom took part in the ceremony; the former of these offered a lamb as a sacrifice (kourban), of the flesh of which they afterwards partook, while fish was provided for the Christians, who were prohibited from eating meat at that season, owing to its falling in the fast of fourteen days which precedes the festival of the Virgin. According to tradition sometimes two or three thousand people were present, and as much as seven mules' load of the earth was carried away to be sent to Constantinople. It was then made into pieces of the size of tablets of soap and was stamped with the Government seal. The locality I have mentioned is

evidently the same which Belon visited, and probably corresponds to that described by Galen. The resemblance between the ancient and modern customs and beliefs is also very striking. The sacred character attributed to the earth and the religious auspices under which it was removed, the offerings made on the occasion, the guarantee of genuineness provided by the seal, and the confidence which was placed in its efficacy as a medicine, are features common to the earlier and the later accounts and seem to point to an unbroken tradition. To these one more may be added, which is not the least curious I have mentioned, that the ancient authorities agree in regarding it as an antidote to poison. At the present day small bowls are made on the spot of this material, and are bought by Turks, who believe that a vessel made of this clay neutralizes the effect of any poison that is put into it. I purchased several of these from the potter, and each of them is stamped in five places with the Government seal, which bears in Arabic characters the same inscription which Belon mentions as being used in his day, 'tin machtum,' *i.e.* sealed earth. This seal, he informed me, was obtained for him from Constantinople twenty years before by an exiled Pasha, who desired that a number of these bowls might be made for him.

"Notwithstanding the long duration of this time-worn belief, it is evident from the neglect into which it has lately fallen that ere long it will be a thing of the past. For several years the Turkish governor has ceased to attend, and following his example first the 'khodjas' and then the priests absented themselves, and no lamb is now sacrificed. Last year only twelve persons were present. Though the tablets were to be bought in chemists' shops in Kastro at the time of Conze's visit to the island in 1885, I inquired in vain for them, and neither the existing Government nor any

persons of the younger generation have heard of this remedy. In the eastern parts of Lemnos, however, it is still in use for fevers and some other disorders, for the women possess nuts of it which they string like the beads of a rosary. These they grate in cases of illness and take a teaspoonful of the powder in water. Not long ago the proprietor of the hillside applied for leave to plough over the spot and sow it with corn, and though for a time this was not allowed by the Government, yet, when the annual celebration has come to an end, the prohibition will safely be ignored, and from that time forward the locality itself will be forgotten."

A few years ago it was sold in the drug bazaar at Constantinople in the form of small balls, stamped with an official seal.

An analysis of its composition proves that the properties of this slightly astringent and absorbent earth were considerably over-estimated, and this no doubt accounts for its disappearance from the Pharmacopœias of the present day. We must, therefore, conclude that its virtues, like those of many other ancient remedies, were chiefly due to the mystery surrounding its origin and the superstitions connected with its source.

III. Treacle (*Theriaca*)

In the second century before the Christian era, Nicander of Colophon, who was physician to Attalus, King of Bithynia, wrote a work entitled "Theriaca," which dealt with the bites of venomous animals and antidotes to counteract their effects.

The substances he recommended as remedies afterwards became the basis of many extraordinary prepara-

tions which were highly thought of throughout successive centuries.

According to Pliny and Galen, the first formula for a theriaca against the bites of all venomous animals was inscribed on stone in the Temple of Asklepios which stood on the island of Cos, and it contained wild thyme, opoponax, aniseed, fennel and parsley.

A similar preparation celebrated in early times was that originated by Mithridates VI (132–63 B.C.), King of Pontus in Asia Minor, who is said to have lived in constant apprehension of being poisoned by his enemies.

He endeavoured to make himself immune from their effects by taking small doses of poisonous substances daily, in combination with the antidote that he devised.

He carried on warfare with the Romans for many years, but was eventually defeated by Pompey, and to save falling into the hands of his enemies he put an end to his life. After the conquest, Pompey is said to have captured the coveted recipe for the Mithridate, as it came to be called, among the secret papers of the king.

The preparation contained fifty-four ingredients, which included gentian, valerian root, cinnamon and many other spices and herbs.

Needless to state, this elaborate electuary would be quite useless as an antidote to any poisonous substance, but judging from what Pliny tells us of some of the so-called poisons known to Mithridates, such as the blood of a duck found in a certain district of Pontus, which was supposed to live on poisonous food, there is little wonder that he believed in its efficacy. He employed the blood of this duck as an ingredient in the

later modifications of his electuary and states that he did so because he had observed that " these ducks fed on poisonous plants and suffered no harm."

Zopyros, a Greek physician of Alexandria about 80 B.C., was the author of another formula for a theriaca which he called " Ambrosia." It contained frankincense, galbanum, pepper and other aromatic substances made into a conserve with boiled honey.

A more celebrated compound was that originated by Philon of Tarsus, who flourished in the early part of the first century, and who recorded his formula in symbolic Greek verse. As an instance of the fantastic symbolism he employs, he mentions among the ingredients " The red hair of a boy whose blood had been shed on the fields of Mercury," and concludes by directing that the ingredients are to be made into a conserve with " The work of the Daughters of the Bull of Athens," which is supposed to mean Attic honey.

The Theriaca Philonium has an interesting history and survived over 1,700 years. It became included in many of the Pharmacopœias of Europe and remained in the London Pharmacopœia until 1746, the formula consisting of opium, pepper, ginger, caraway, syrup, honey and wine.

Until 1746 it was known as Philonium Romanum, but after that it was called Philonium Londonense, when syrup of poppies was introduced into the formula in place of honey. It is thought probable that this conserve was originally introduced as a remedy for a peculiar form of colic which became epidemic in Rome when Philon flourished there. Philon's formula was the basis of the preparation afterwards known in the London

Pharmacopœia as Confection of Opium, which remained official until 1867.

The Theriaca, however, which eclipsed all others in fame and popularity was that invented by Andromachus, physician to Nero, who lived between A.D. 37 and 68.

Andromachus claimed that his formula was an improvement on that of Mithridates, and so much did the Emperor appreciate his physician's efforts to devise a universal antidote, that he raised him to the dignity of Archiatrus.

Andromachus called his preparation "Galene" and included vipers among the ingredients. He wrote his formula and described its virtues in Greek verse which he dedicated to Nero. He declared that it would "counteract all poisons and bites of venomous animals, and that it would also relieve all pain, weakness of the stomach, asthma, difficulty of breathing, phthisis, colic, jaundice, dropsy, weakness of sight, inflammation of the bladder and kidneys and the plague."

Galen states that he "tested this antidote by giving it to a number of fowls to which he had first administered a poison. Those to which the Theriaca had been given survived, but all the others died."

The original formula of Andromachus contained seventy-three ingredients, including rhubarb, black pepper, cinnamon, ginger, sealed-earth, cardamoms, vipers and opium, and this remarkable preparation continued to be used for centuries.

Another compound which attained considerable popularity was that devised by Damocrates, a Greek physician who lived in Rome about 26 A.D., and who modified the formula of Mithridates.

It was chiefly notable on account of containing valerian root, sweet flag, pennyroyal, skinks and opium.

Other famous formulæ were originated by Nicolaus of Salerno, Amando, Arnauld and Peter of Abano, each of whom added something to the original recipe.

The popularity of these preparations may be said to have reached its zenith in the sixteenth century, when Pietro Andrea Matthiolus, the commentator of Dioscorides, published another formula which contained no less than *two hundred and fifty* ingredients which included vipers, pearls, red coral and emeralds. This Theriaca in a modified form was included in the first London Pharmacopœia in 1618 and continued as an official remedy until 1746.

Several cities became famous for the manufacture of Theriaca, the most celebrated being Venice, Florence, Bologna, Genoa, Constantinople and Cairo.

The Theriaca of Venice, or Venice Treacle as it was popularly called, contained sixty-one ingredients and had a reputation throughout Europe. It is thus alluded to by Evelyn in his Diary, March 23, 1646:

"Having packed up my purchases of books, pictures, casts, treacle, etc., the making and extraordinary ceremony whereof I had been curious to observe, for it is extremely pompous and worth seeing, I departed from Venice."

In many of the cities of Italy, the preparation of this remedy was regarded of such great importance, that it was only carried out on certain occasions with great pomp in the presence of the leading civic authorities.

In Bologna, the mixing was carried out with much

ceremony in the courtyard of the ancient Archiginnasio, where the chief officials of the city, the leading physicians and professors of the medical faculty of the University, attended, to ensure that the preparation was faithfully and properly compounded.

In Montpellier, according to a report by Laurens Catelan, Master Apothecary-in-Ordinary to Monseigneur the Prince of Condé, it was required that, " the Theriaca should be prepared in public in the presence of the very illustrious professors of the famous Faculty of Medicine, so that they might have the opportunity of censuring or approving the ingredients and that the public might therefore be sure of the virtue of these important medicines."

Theriaca has been made at Cairo from an early period and it was customary with the Sultans of Egypt to make gifts of their famous medicine to the heads of other countries. There is a document recording a present of Theriaca to the Doge of Venice.

Prosper Alpinus, the celebrated physician and naturalist of Padua, who travelled in Egypt in 1591, thus alludes to the preparation of Theriaca in Cairo. He states, that " it was only allowed to be made in public, and that the ceremony was performed once a year in the Mosque of Morestan by the chief apothecary of the city, in the presence of all the physicians." He remarks, that in his time, " Italians, Germans, Poles, Flemings, Frenchmen and Englishmen came to Cairo to purchase their Theriaca."

Theriaca was known and used in England as early as the eleventh century, and is recorded in an Anglo-Saxon manuscript of that period as having been recommended

to Alfred the Great, by Helia the Patriarch of Jerusalem. In a Close Roll of King John in 1208 it is also mentioned, and a "Triacle box du pere apelle une Hakette garniz d'or" is enumerated among the precious objects that belonged to King Henry V.

In the fifteenth and sixteenth centuries large quantities of the confection were consumed in England, and this is evidenced by Morgan, Apothecary to Queen Elizabeth, who, in a pamphlet, insists that "a confection he had made had been compared with other 'Theriacle' brought from Constantinople and Venice, and had been commended.

"It is very lamentable to consider," he continues, "that straungers doe dayly send into England a false and naughty kinde of Mithridatium and Treacle in great barrelles, more than a thousand weight in a year, and vtter ye same at a lowe price for 3d and 4d a pound, to ye great hurt of Her Majesties subjects and no small gaine to straungers purses."

In 1612, the Master and Wardens of the Grocers' Company of London called attention to the fact, that "a filthy and unwholesome baggage composition was being brought into this Realm as Tryacle of Genoa, made only of the rotten garble and refuse outcast of all kinds of spices and drugs, hand overhead with a little filthy molasses and tarre to worke it up withal."

On this being communicated to the College of Physicians, they set about not only to devise their own formula but to superintend its manufacture, which they entrusted to one William Besse, an apothecary in the Poultry. Besse was made to take a "corporal oath" before the Lord Mayor, and every year when he pre-

pared the confection he had to show the ingredients and the finished product to the officials of the College. The price was restricted, and it was not to be sold for more than 2*s.* 8*d.* a pound or 2*d.* an ounce.

As late as 1722, it was publicly prepared by the Society of Apothecaries and sold in pots stamped with their seal at their laboratory in Water Lane.

Moses Charas, apothecary to the Duc d'Orleans, is said to have been the first to make theriaca in public in the Garden or Hall of the Guild of Apothecaries of Paris, in 1667. The numerous drugs were first set out for public inspection, and explained to the apprentices and others interested, with much ceremony and solemnity.

It is recorded that in 1684, Matthieu François Geoffroy, Antoine Jossou and Simon Boulduc, who were the leading apothecaries in Paris at the time, took four months to prepare 400 pounds "in great pomp." In 1702, Rouvière made 2,200 pounds in the Great Hall before his assembled colleagues and many other persons. As no jar could be found capable of holding such a quantity, a very handsome one had to be specially made which long stood in the laboratory of the Guild.

Some years ago some gigantic jars were discovered stored away in a remote part of the building inscribed "Theriaca." According to a list dated 1799 the preparation was sold at ten francs a pound.

As time went on, although the preparation still commanded a good sale, the number of the ingredients was diminished, and in the French Codex of 1818, they were reduced to 71 in number; in the 1837 edition there were 69 drugs employed, and in 1866, they were again reduced to 57, including vipers and castoreum. In the

edition of 1884, however, the former, which had hitherto been regarded as one of the most important ingredients, was omitted.

Vipers were highly esteemed in France for their invigorating properties in the seventeenth century, and Madame de Sévigné writing in the year 1685, declared, that it was to vipers she owed her robust health. " They temper, purify and refresh the blood," she states in one of her letters. " But real flesh must be used, not the powder. Ask M. de Boissy to send you ten dozen vipers from Poitou, three or four only in each box so they may travel in comfort, packed in moss and sawdust. Then take a couple every morning, cut off the heads, have them skinned and chopped up and stuffed in a chicken. Do this for a month, and then blame your brother if M. de Grignan does not become as well as we could wish him to be."

Much has been written concerning this ancient and interesting preparation, which has a literature of its own, and has survived to the present day.

In many of the old pharmacies in Italy, large vases of marble capable of holding thirty or forty pounds, labelled " Theriaca " or " Mithridatium," are still to be found. It is also made and sold in Constantinople, where it has been prepared for centuries and is still in frequent demand as a domestic remedy.

CHAPTER V

HISTORIC MEDICINAL PREPARATIONS FROM THE FIRST TO THE TENTH CENTURY—ST. COSMAS AND ST. DAMIAN

FROM an early period the study of drugs appears to have attracted more than one royal personage. Attalus Philometer, the last king of Pergamos (*ca.* 200 B.C.), studied medicine and botany and is said to have attained great skill. He cultivated poisonous plants such as hyoscyamus, aconite, hemlock and hellebore in his garden, and then experimented on the efficacy of antidotes to counteract their poisonous effects.

Nicomedes of Bithynia (278 B.C.) and Antiochus of Syria (280 B.C.) also distinguished themselves in this way. The best known of these medical monarchs was Mithridates VI, King of Pontus (124–64 B.C.), mentioned in the previous chapter, whose botanical attainments have been perpetuated in several plants which have been named after him. Diachylon (lead) plaster, still included in the British Pharmacopœia, was first prescribed by Menecrates, physician to Tiberius, about the year A.D. 34.

To Servilius Damocrates, who lived in the time of Tiberius, is attributed a famous tooth powder, and other pharmaceutical preparations, including an Acopa or embrocation for the relief of pain, together with various electuaries and plasters.

Dioscorides, who has justly been called the "Father of Pharmacy," flourished between the years 40 and 90 A.D. He was the first independent investigator and writer upon drugs employed in his time, and for centuries influenced the art of the apothecary. He enumerated about four hundred plants, and gathered his knowledge in his extensive travels through Italy, Gaul, Spain, Germany and Greece. Many of the drugs he mentions are still used to-day, as, for instance, aloes, ox-gall, cinnamon, mercury, lead, copper sulphate, myrrh, asa-fœtida, gum ammoniacum, opium, squill, wool-fat (now known as lanoline), male-fern, horehound, and others.

After the time of Pliny, medication appears to have developed along two distinct lines. The one originated by Galen, which may be called the scholastic or more scientific side, which was continued by Oribasius, Alexander of Tralles, Paul of Ægina, and so on through the Byzantine period to the compiling of the Anti-dotaria, the forerunners of the pharmacopœias of later times. The other, which may be described as popular medicine, was carried on from the time of Pliny and Scribonius Largus to Apuleius and Sextus Placitus, and developed into the herbals which played a part in the art of the apothecary from the fourteenth to the end of the seventeenth century.

Galen (A.D. 130–201), from whose name we have the word "galenicals," a term applied to vegetable pre-parations for use in medication, influenced the art of the apothecary for centuries after his time. The number of drugs mentioned in his works is very large, and he was a firm believer in those of vegetable origin. Mineral

remedies he rejected, and regarded mercury as a most powerful poison.

He employed fomentations, poultices, gargles, pessaries, catapotias, ointments, oils, cerates, collyria, looches, tablets and inhalations. As an example of the latter, he orders sulphur and asphalt, mixed with hyssop, to be burnt and inhaled for quinsy. His narcotics were poppy-juice, henbane seeds and mandragora, and his purgatives hellebore, elaterium, colocynth and scammony. The effect of drugs he believed to be based upon "the harmony or disagreement of their qualities, with the behaviour in diseases of the elementary qualities. These qualities were cognizable by the senses, and upon them depended the use of remedies. When the character of the disease was known, a remedy was chosen to correspond therewith."

Alexander of Tralles (A.D. 525–605) was the first to mention the use of rhubarb in medicine, and to recommend blisters in the treatment of gout, and mild laxatives in the place of astringents in the treatment of diarrhœa.

During the Byzantine period, reference is made to the pimentarii, who prepared medicines ordered by the physicians, and sold draughts, lozenges and pills to the lower classes. It is an interesting fact that the Anglo-Saxons prepared a drink which they called "piment," afterwards called "pigment" by the Danes. It was made from a mixture of acid wine, honey, sugar and spices. This beverage was drunk to excess in the eighth and ninth centuries, and is said to have formed a fascinating compound similar to a liqueur. The name is supposed to be derived from the pimentarii or apothecaries, who originally prepared it. The most common

varieties of piment were later called hippocras and glarry, both of which are mentioned by Chaucer in his "Canterbury Tales" about 1388.

In the fifth century, the Nestorians, who were banished from the Byzantine Empire, took refuge in the eastern parts of the Empire Khonzistan, and there founded at Dzchonisabour a medical school, where those skilled in medicine of Western Asia met the learned physicians from India on neutral ground. It is stated that in this school about A.D. 765 the apothecary's art was taught as a separate branch of healing, and there is some evidence of this in the "Syraic Book of Medicines,"[1] supposed to have been written about A.D. 500, which throws considerable light on the art of the apothecary at that period in the East. This work, which consists chiefly of a collection of recipes (nearly a thousand in number), mentions a very large number of plants, herbs, roots, seeds and resins, and shows how the materia medica had increased. The whole work is evidently influenced to a large extent by Greek medicine, and was probably written by a physician who had studied in Alexandria, and was an ardent follower of Hippocrates. The chief interest in this book is its bearing on the art of the apothecary and the mention of several new methods of preparing medicines. The form of the recipes is similar to that found in the Egyptian papyri. Beginning with a statement as to what the medicine is intended to effect, there follows a list of ingredients, their quantities, and finally instructions for preparing and administering them.

In cases where the remedy is to be administered in

[1] "Syriac Book of Medicines," translated by Sir E. A. Wallis Budge, London, 1913.

liquid form, it is directed to be given by the spoonful, and solids are to be prepared in the form of pills, tablets or boluses. Pills were to be swallowed or placed under the tongue. Particular directions are given as to the pounding of drugs, their infusion with water, and instructions for preserving them for a time before use. In some cases the drugs were to be preserved by having poured upon them a mixture of boiled oil and honey in equal parts. The whole was then to be stirred well together and kept for six months.

Among the preparations recorded are nasal injections composed of salt and sal ammoniac, and applications with sweet oil as a basis to be applied to the nostrils. Gargles are recommended for throat ailments, and insufflations, consisting of astringents reduced to a fine powder, are directed to be blown into the nostrils or introduced by means of a plug.

A preparation called Pramtikon (stibium) is recommended to be smeared inside and outside the eyelids and placed in the corners of the eyes.

Many formulæ are given for Antidotes, a name applied to remedies for counteracting disease. They consisted of numerous ingredients of animal, vegetable or mineral origin, which are directed to be crushed, then made into a paste with unboiled honey and administered in wine.

The Antidotes became so numerous, they eventually formed a distinct class of preparation, which were afterwards known as Antidotaria.

Some of them were associated with the names of famous persons, such as the "Antidote of Cæsar" or the "Gold Antidote," which contained forty ingredients, including gold and silver, and took a year to prepare.

The dose was a piece the size of a bean, which was to be swallowed in a mixture of wine and water.

The solvent properties of gall were recognized, and the galls of various animals and birds played an important part in preparations for the eyes. One of these applications contained the galls of the raven, partridge, vulture, cock, hyena and goat, equal parts of which were to be made into an ointment with honey and, after being mixed with water, applied to the eyes.

For deafness, goat's gall or ox gall was to be mixed with warm oil and dropped into the ears to dissolve hard wax.

Plasters were prepared by melting various gums and gum-resins in oil, then adding wax to bring them to a proper consistence to be spread on linen. Liniments and embrocations were made by the addition of more oil to the plasters until they were semi-liquid.

Dentrifice powders were used to clean the teeth, and washes were made of astringent roots boiled in wine to rinse the mouth and harden the gums.

The name Linctus was applied to both liquid and semi-solid preparations, which were made by evaporating juices or other liquids mixed with honey until of a sufficiently thick consistence.

Tablets were made of powders mixed with the juice of certain berries and then allowed to dry, and afterwards swallowed with rose-water. Simple infusions of herbs in hot water were frequently employed and poultices are recommended to be applied to the chest for diseases affecting that part. Syrup of poppies was a popular remedy for coughs and inhalations were recommended in cases of lung troubles. Medicated inhalations were carried out as follows :

The ingredients were well crushed and a little white of egg and sesame oil poured upon them, the whole being mixed together and spread on a piece of cotton-wool and dried in the shade. When the inhalation was required, a vessel like a thurible with a cover was used, with a hole in the top and a reed fixed therein. Hot coals were put in the thurible, and a piece of the cotton-wool on which the medicine had been spread was placed on the red cinders. The patient was instructed to take the reed in his mouth and inhale as much of the smoke as he was able to bear, and to carry this out for seven days.

Clysters or enemas are directed to be made from the centaury plant and hot oil, and medicated fomentations are described which were to be made with certain powdered drugs mixed with barley flour, then placed between bandages dipped in hot water and laid upon the affected part. The ingredients for making vegetable extracts are directed to be first infused in vinegar for twenty-four hours, then evaporated to half the quantity. After being pressed, the liquid was mixed with honey and boiled down until it was of a stiff consistence.

Many formulæ are given for medicated wines, which were prepared by reducing the drugs employed to powder, tying them up in a linen cloth and placing it in the wine, which should be in a glass vessel. The vessel being sealed, it was to be allowed to stand for a period of from one to four weeks and then decanted.

Oxymel, a preparation of honey and vinegar used by the physicians of ancient Greece, was well known to the Syrians, who also made an oxymel combined with squill bulbs.

The name Treacle was applied to any thick compound

of which honey was the chief ingredient, and was a popular method of administration.

The term mixture was applied to a semi-solid compound, like a confection, usually consisting of vegetable substances such as roots and seeds, powdered and incorporated with honey.

Suppositories were made by reducing the ingredients to a fine powder, making them into a thick paste with honey that had been boiled to solidity, and then moulding them into a suitable shape. They were apparently made in the shape of acorns similar to that employed to-day, as one formula directs, that "they are to be made into oblong pills about the size of small acorns, and anointed with oil of roses before use." They were employed for constipation, fistulas and diseases of the colon, and the patient is enjoined to "bear them as long as he can."

A curious method of administration, which is said to have been originated by Severianus, was to "make a hole in an egg and insert the powdered drug therein and suck the contents."

In a treatise on medicine, written in Hebrew by a Jew called Donnolo, who was born in Southern Italy in A.D. 913, there are some interesting allusions to the art of the apothecary at that time. The manuscript, of which only a few pages remain, is called the "Precious Book" and has been translated by Leveen, from which the following is extracted:

"This is the book of drugs, potions, powders, plasters, salves and unguents (?), which was composed by Shabbethai the Physician called Donnolo, the son of Abraham, who was driven out of the town Uris (*i.e.* Oria) in order to teach it (*i.e.* the book) to the physicians

of Israel, and to instruct them how to prepare the drugs according to the wisdom of the physicians of Israel and Macedon, and according to the experiments he himself made with his own hands in the science of medicine, probing and plumbing the depths of medicine for forty years, by the command of God.

"It is fitting for wise and skilful physicians to have knowledge first of all the perfumes and gums of healing plants, and of healing oils and herbs, in order to recognize them through the instruction conveyed by teachers and the books of the ancient scholars. By these means they will know and understand whether the perfumes, the juices, the oils and the herbs are pure and clean and free from any adulteration or tampering, for the sellers of these goods are deceitful and adulterate them. It will also be fitting to have knowledge of those balsams and gums which can be pounded in a mortar or sifted with a sieve, and to know what gums may be dissolved by heat, either with honey or with oil. Only then can the physician proceed to prepare such drugs as he desires."

The importance that was attached to honey as a remedial agent is shown in the following detailed process for making depurated honey given by Donnolo:

"If the physician wishes to mix the herb potions with honey, he must do so in this manner: After he has pounded the plants and sifted them through a very fine sieve he should warm the honey in a vessel of clay or a vessel called *Lapio*, over a fire of coals, but not upon the actual flame. He should keep on stirring the honey all the time unceasingly, in order that the honey might not boil over, and when he sees the froth come to the top, he should remove the vessel from the coals until it has cooled down somewhat. He should then remove the froth with a spoon, until all that remains is pure and clear

honey. Then he should put it once again in the vessel over the coals, so that it should get hot again, and thus shed most of its moisture before it hardens and congeals. For if the honey be hard the drugs can keep for years and days without spoiling. But if the honey be moist and thin the drugs soon spoil and cannot be kept long. And after the honey has been heated according to these directions, then all the plants which have been pounded and sifted should be put in the mortar."

Some hundred and twenty names of medicinal plants and minerals occur in the course of this short fragment. Of these only one is definitely Arabic, two are doubtfully so; one is a literal translation of the Arabic; there are a number of Biblical and Talmudic words, and the rest are either Greek or Latin in form.

The following drugs are mentioned: bdellium, frankincense, opium, origanum, liquid pitch, mint, ivy, hyssop, aloes, black hellebore, ammoniac, asphodel, opoponax, cedar, citron, balsam, artemisia, aristolochia, pennyroyal, wild onion, veronica, genista, tragacanth, rose-laurel, zedoary, olive, ginger and sesame.

From the Anglo-Saxon Leechdoms mostly written in the tenth century we get a glimpse of the apothecary's art as practised in England at that period.

Although they invoked their deities, believed in charms and performed incantations in times of sickness, the Anglo-Saxons relied largely on their wort-cunning or knowledge of herbal remedies in the treatment of disease.

They employed henbane, colchicum, chamomile, horehound, rue, fennel, mustard, rosemary, marsh-mallow, coriander, dill, celandine, wormwood, hellebore,

elder, violets, foxglove, hops and other indigenous plants as remedial agents.

From their recipes, it is evident they also knew the properties of aloes, cinnamon, scammony, myrrh, galbanum and other gums and spices which they must have obtained from abroad.

They used wine, beer or vinegar to extract the virtues of their drugs, and employed lard, butter and goat's grease as a basis for their salves and ointments. The decoction was a favourite form of preparation, and was made by boiling the roots or leaves of certain plants in water, beer or wine, then evaporating the liquid down to a third, when it was deemed ready for use.

Pills were made up with goat's grease, and poultices with the leaves of herbs and crumb of bread pounded together. For application to inflamed surfaces they used the juices of fresh plants and afterwards dusted the part with finely powdered seeds.

For pain in the limbs they employed embrocations of goats' grease, and used plasters composed of pig's fat with the crushed leaves of several herbs. They dropped the juice of henbane, after being warmed, into the ears to cure earache, employed fumigations in fevers, and used baths, medicated with spearmint and pepper, for rheumatism and lumbago. For coughs and colds they placed great faith in a mixture of horehound and honey, a favourite domestic remedy for the same ailment in many parts of the country to-day.

From about the seventh century, Cosmas and Damian have been the tutelary saints associated with medicine. St. Cosmas is usually represented as the physician holding a urine flask, while his brother martyr is variously depicted,

either carrying a portable medicine chest, an ointment jar or a spatula, so may be rightly appropriated to the apothecary.

The twin brothers Cosmas and Damian, whose feast is celebrated on September 27th, were born in Arabia and practised the art of healing at Ægea, now Ayash (Ajass) in Cilicia, Asia Minor, with great success. They refused to accept payment for their services to the sick and suffering, but, as Christians, are said to have converted many to the faith.

ST. DAMIAN

When the Diocletian persecution began, the Prefect Lysias had them arrested and commanded them to recant. Several times they were put to the torture but received no injury, and in the end were beheaded with the sword.

At a later period, many legends grew up concerning the miracles they had wrought, and their remains were buried in the city of Cyrus in Syria.

The Emperor Justinian I (527–565) restored the city in their honour, and rebuilt and adorned their church at Constantinople. At Rome, Pope Felix IV (526–530) erected a church in their honour to which their relics

were conveyed, and lavishly decorated it with most beautiful mosaics. Several churches were dedicated to the saints in England, including one still existing in the Forest of Blean in Kent.

Their miracles and scenes from their lives were painted by several of the great Italian masters, including Botticelli, Fra Filippo Lippi, Michael Angelo, Tintoretto, Titian and Fra Angelico. The latter painter's rendering of one of the legends connected with the saints is regarded as a masterpiece. The story which the artist depicts is as follows :

A certain man who was suffering from a malignant growth on his leg went to pray in the church dedicated to the saints in Rome. After his devotions, he fell asleep and had a vision, in which he beheld the saints standing by his side.

One said, " What shall we do to replace this diseased leg when we have cut it off ? " The other replied, " A Moor has been buried in San Pietro Vincole. Let us take his leg for the purpose."

Then they brought the dead black man's leg, and after amputating the diseased leg of the sick man, they replaced it with the leg of the Moor, and thus he miraculously recovered the use of his limb.

In Fra Angelico's picture one saint is depicted supporting the sick man's shoulders, while the other is adjusting the black leg to his body.

CHAPTER VI

THE ART OF THE APOTHECARY AMONG THE ARABS

AFTER the decline of the Byzantine Empire, the Arabian school, which exercised such an important influence on the apothecary's art in Europe, came into prominence.

Among the Arabs, from the eighth to the twelfth century, pharmacy reached a high state of culture, owing to the careful study they gave to the many valuable drugs their country produced. Arabia was the habitat of the trees and shrubs that supplied the then known world with aromatic gums and valuable spices, such as olibanum, myrrh, cinnamon and cassia, and Arabia Felix commanded the main trade route of the spice merchants from east to west, which also brought them in touch with the Orient.

They also cultivated the study of chemistry, which they brought to bear on their knowledge of plants and herbs.

As early as 754, a school for the study of medicine was established by the Caliph Abu Dschaffer al Mansur at Bagdad, and an apothecary's shop was established there. This was followed by dispensaries, which were attached to their hospitals, where students were taught the apothecary's art, and obtained a practical acquaintance with the preparation of medicines under the direction of trained instructors.

AN EASTERN APOTHECARIES SHOP

From an engraving 1505

The Arabs regarded a special training necessary for the compounding and mixing of drugs, and the apothecaries were held responsible to the authorities for keeping their stocks in proper condition, their shops in order, and for the purity of the medicines they sold.

The first apothecary's shop in Bagdad was kept by Abu Coreisch Isa el Szandalani, who, it is said, opened it at the instigation of the Caliph himself. The shops were open-fronted, no doubt similar to those in the bazaars of Eastern cities to-day, and were characterized by the pots and jars of many-coloured earthenware or glass, placed on shelves over and around. On a table or counter across the front stood the scales, mortars and other implements of the craft.

It is probable, that from this custom of exhibiting their drugs in glass jars, the druggists of Western Europe afterwards came to employ the carboys of coloured water as a common symbol of their calling.

Being a nomad race, the Arabs soon spread westwards from the Persian Gulf along the northern coast of Africa, across the Mediterranean into Spain, carrying with them their arts and customs.

Abd-er-Rahman I, formed Spain into an independent Caliphate, and, in the eighth century, Cordova became the centre for the teaching of science, and was made the Moorish capital.

In the time of Abd-er-Rahman III the city contained two hundred thousand houses, and nine hundred public baths. It carried on a good trade in cochineal, ambergris, antimony, sulphur, saffron, ginger and spices from the East brought to the Mediterranean ports, and was the

headquarters of many of the great Arabian apothecaries, such as Moses Maimonides, who was born at Cordova in 1139.

Thus the turbaned hosts of Mahomet carried their all-victorious banner into Western Europe, and their arrival was soon followed by the establishment of their arts in the countries in which they settled. They introduced the systematic study of drugs into Toledo, Seville, Granada, and other large cities which came under their dominion, and founded universities, and established shops for the preparation of medicines prior to the twelfth century.

The Arab apothecaries were divided into two classes, viz. those who sold simple medicines and non-magistral preparations according to a stated tariff, and the compounders, whose work consisted in scrupulously dispensing the prescriptions of the physicians. According to law, every physician was required to give information against any apothecary who sold impure or unsatisfactory drugs.

Among the Arabs the practice of the apothecary's art was distinct from that of the physician, and Avicenna is recorded to have taken refuge with an apothecary at Hamadan, and there wrote some of his famous works on medicine. The Arabs introduced drugs of milder action in place of the more drastic ones used in earlier times; thus, senna, rhubarb, tamarinds, musk, cassia, camphor, nutmegs, cloves, saffron, fennel, liquorice and many other vegetable remedies came into use among the nations of the West. They originated the practice of coating pills with gold or silver leaf, and were the first to distil rose-water. To them we owe the introduction

of nux vomica into Europe in the eleventh century, and many words still used in pharmacy, such as alcohol, alkali, syrup, naphtha, and bezoar, were originated by the Arabs. In chemistry, also, they made a considerable advance, and our knowledge of potassium nitrate, sulphuric acid, corrosive sublimate, nitric acid, arsenious acid, mercuric chloride, silver nitrate and lead acetate, is due to these early workers in the science of chemistry.

In their medical schools the chief text-books appear to have been Syrian translations of Hippocrates and Galen.

Literature received some valuable additions from Serapion (802–849), who wrote on the art of preparing medicines, Jabir Ibn Hayyān (Geber), the famous alchemist who laid the foundations of modern chemistry, and from Mesué (780–857), one of the most eminent Arabian physicians, and adviser to Haroun Al Raschid, the great Caliph of Bagdad, who strongly opposed the use of violent purgatives, so common among the Greeks and Romans. He recognized the aperient properties of senna, cassia, tamarinds and myrobalans and his knowledge of the apothecary's art was considerable.

Bagdad at that time was a large and populous city containing nearly a million inhabitants, and its university is said to have been attended by six thousand students. It is recorded that the Caliph Haroun Al Raschid sent emissaries to Charlemagne in A.D. 807 with presents of balms, spikenard, unguents, drugs and medicaments in great quantities.

The practice of the apothecary was even organized in their army, and there is record that Afschin, the Commander-in-Chief, inspected the military dispensaries to assure himself that all necessary drugs were included.

This golden age of Moorish medicine lasted several centuries, and produced many great men, among whom were Rhazi, who wrote the first book on small-pox, Avicenna, called the " Prince of Physicians," Albucasis, the surgeon, Avenzoar, who wrote on syrups, electuaries, and the preparation of drugs, and Averroës, who recorded the history of Theriaca.

Avicenna (Abú Ali Husayn ibn Abdu'llah ibn Síná) was a Persian by birth and was born at Bokhara in 980. From an early age he was a keen student of botany, and when sixteen is said to have been practising physic, in which he became famous before he was twenty. His great book "Canon," an encyclopædic work on drugs and simples, diseases and compound medicines, perpetuates his memory.

The greatest Arab botanist was Ibnu'l Baytár, who was born at Malaga, and who travelled through Greece, Asia Minor and Egypt in search of medicinal plants. He became director of the medical school of Cairo, and there compiled his great Arabic Herbal, in which he describes nearly eight hundred plants and drugs. He died at Damascus in 1248.

CHAPTER VII

THE APOTHECARY IN ENGLAND FROM THE TWELFTH TO THE SIXTEENTH CENTURY—COURT APOTHECARIES

THE term apothecary, derived from the Greek *Αποθήκη*, signified a storehouse, and Galen uses the word to denote the repository where he kept his medicines.

In Rome, as previously stated, the apotheca was the place where herbs were stored, and apothecarius was the name applied to the keeper. Thus the term afterwards came to be employed for one who prepared the drugs and spices for medicinal purposes, and so passed into modern languages, with its special meaning as the English apothecary, the French apothicaire and the German apotheke.

The mystery or secrets of the art of the apothecary consisted in the various methods of preparing drugs for administration to the sick. The *mystery* actually meant the *secrets* of the art, to learn which, a long apprenticeship was necessary. Thus the formula, art and mystery came to be used in the indentures by which an apprentice was bound to learn his craft, and in the fifteenth century members of a trade guild were still described as "men of the same mysterie."

The earliest record at present known in which an apothecary is specially mentioned in England, is a

Pipe Roll of Henry II in 1180, where an apothecary is stated to have accompanied the King on a journey to Ireland. The next who is mentioned by name is John le Spicer, Aut Apotecarius, who Bardsley states was "Mayor of York in 1273," and in 1292 there is record of an apothecary's shop in the same city where Master Otto of Germany, a physician of repute, had his medicines prepared.

In the fourteenth century or earlier the apothecaries were associated with the Pepperers, an influential body or guild mentioned in the Pipe Rolls of 1179–1180. They were a company of traders or merchants, who imported and regulated the sale of drugs and various spices that came from the shores of the Red Sea, Arabia and Eastern ports. It is thought that their connection came about through the methods of weighing, as for those traders who used the "aver-depoys" the Pepperers were the official custodians of the statern (steelyard) and the balancia (scales), and were the keepers of the great beam.

For trade convenience, as well as for mutual protection and support, members of the same guild or trade often settled in one locality, and so the Pepperers gathered about St. Antolin's Church at the junction of Soper's Lane (now Queen Street) with Watling Street, and Budge Row in St. Thomas Apostle. This localization of trades took place in other cities, and in Oxford as early as 1297 there was a district near St. Mary's called the Spiceries or Apothecaria, where those who sold and dealt in apothecaries' wares had their stalls or booths.

In 1328 the Pepperers adopted the name Grossarii

(grocers), and received official recognition as the body that had the regulating of weighing in the City.

In 1329 there is record that one Roger de Frowicke, an apothecary, " was by gild of the Apothecaries, a body associated with the Pepperers."

Some years later they amalgamated with another body called the Spicers, who traded in similar wares, but they ultimately came into difficulties, and in 1345 a new fraternity was founded which was known as the Pepperers or Easterlings of Soper's Lane and the Spicers of the Ward of Chepe. It was in this district they had their stalls or shops where they sold perfumes, spices and drugs, and they paid a toll to the King in kind, consisting of a certain quantity of pepper. Their patron saint was St. Anthony, and until the year 1373 they bore the title of the " Fraternity of St. Anthony."

Many of the Spicers were Italians, while the Easterlings were chiefly Germans from the Baltic coast and the Hanse towns who had brought produce from the East to sell it in London to the Pepperers and Spicers, who thus became the distributors.

The Guild was apparently a progressive body, and is said to have introduced improvements in the coinage. There is a record that in 1221, Andrew Bokerell, a pepperer, was appointed keeper of the King's Exchange, whose duty it was to receive the old coining irons and deliver new ones to all the Mints in England.

According to an ordinance in 1376, " no one of other mistery shall be admitted into the company without the common consent."

A spirit of jealousy, however, gradually grew up between the various branches of the guild, and as years

went on, the breach became wider and the brotherly love and unity of the promoters became a dead letter. The title of "Fraternity of St. Anthony" was dropped and that of the Company of Grocers substituted. This came to be officially recognized, and in 1428 the Company received its first charter from King Henry VI.

It is obvious, from these historical records, that the Pepperers, Spicers and Apothecaries were originally branches of the same guild, the latter dealing more in drugs for medicinal use, while the former traded in the spices and condiments employed for domestic purposes. This is corroborated by the particulars of their stocks which are still on record.

In addition to drugs, the apothecaries kept the rarer kinds of aromatic gums exported from the East through Italy, and also sold pepper, sugar and wax candles. In 1366, Maundeville alludes to the "Marchauntis and apotecaries" as being distinct traders, and Chaucer, in the "Physician's Tale," says, "Ful redy hadde he hise apothecaries to send him drogges."

There is an interesting entry in the Great Wardrobe Book concerning Queen Eleanor, who, when travelling through Lincolnshire to meet the King, was seized with an "autumnal fever" at Hardeby near Grantham. The illness was a lingering one, and it was not until her condition was regarded as serious that the King was informed of the fact. Henry Montpellier, one of her apothecaries, was at once despatched, and was paid "13*s.* 4*d.* for syrup and other medicines bought at Lincoln on October 28th, 1290, for the Queen at Hardeby."

From this account it is evident that an apothecary held

a Court appointment at the period which was distinct from that of the physician, for there is a statement, later, that Master Leopardo, the Household Physician, was in attendance on the Queen, in addition to a leech in the service of the King of Aragon. Henry Montpellier was probably a Frenchman who had studied his art at the ancient centre of learning of that name and had been sent to England in the entourage of the Queen.

In 1308 there is mention of an apothecary in a deed found among the Dering Papers, which states that at "Pluckley, Kent, a grant of right of way was made by one John de Sellinge, Eppecer of London, to John, son of Malmayns of Waldershall, also of a quit claim of the same, wherein Sellinge is termed 'Apothecarius,'" and in a later deed, dated 1317, the same person is called a "citizen and Apothecary."

In the Wardrobe Rolls of 1313 there is record of one Odin the Spicer, an official at the Court of Edward II, who received 7½*d.* a day as Apothecary to the Queen; also in a later entry of 1313–1314, there is mention of Peter de Mount, a "pedler's apothecary," who was probably one of the itinerant dealers in drugs who travelled about the country to sell his wares.

There is further mention of an apothecary called "John" in the Scottish Exchequer Rolls of 1329, to whom payments were made for materials for embalming the body of the famous Robert the Bruce.

In a State Record dated September 3rd, 1330, in the third year of the reign of Edward III, there is an interesting entry concerning an ordinance of the Treasurers and Barons of the Exchequer, directing the payment of "5*s.* 6*d.* to Master Peter de Montpellers (Montpellier)

the King's Apothecary, who was then staying with Gilbert Talebot and Master Pancius de Controne, the King's Physician, at the Manor of Hoxme, who were then sick; and to two grooms and one horse of Peter's, their necessaries during their stay."

"A like order of an allowance of £7 2*s*. 8½*d*. to be paid to Master Pancius de Controne, who was then ill; to John Luca (Apothecary) then staying with Pancius, and to two men and two horses of the said John, their necessaries during the time of their stay."

The Master Peter de Montpellers was probably the same person as Pierre de Montpellier, who, according to Freind in his "History of Physicke" (1725), was Apothecary to Edward III in 1360. It is also possible that the "John Luca, Apothecary," mentioned, was identical with J. Falcand de Luca, who, the same author states, "was the first apothecary to sell medicines in England in 1357."

Rymer, who was appointed by William III to compile his records from the Official State Papers in 1704, tells us, that "a pension of 6*d*. a day was granted to Coursus de Gangeland, an apothecary of London in 1345, in recognition of his services to the King during his illness in Scotland." Rymer's records are generally regarded as accurate, though there is no confirmation of the statement in the State Records of the time.

The costume or robe of the physician and apothecary attached to the Royal Household in the fifteenth century is alluded to in an entry in the Great Wardrobe Papers on February 27th, 1428, when, by a writ of Privy Seal in the reign of Henry VI, the "King's physicians were paid Forty pounds a year each, also a livery (uniform)

with fur and lining as other Royal physicians have had yearly at the Great Wardrobe, by the hands of the Keeper thereof." That the robe was of green cloth trimmed with miniver, with which a cap of miniver was also worn, we know from a later entry in 1454, and this custom probably dates back to a much earlier period.

In that year an interesting account is given of an illness of a serious character from which Henry VI suffered. When he was first taken unwell, a commission of five physicians and surgeons was appointed by the Duke of York and his Council on April 6th, 1454, to attend to the person of the King and to watch over his health.

This commission empowered " those beloved Masters, John Arundel, John Faceby and William Hacliff, physicians, and Robert Warreyn and William Marshall, surgeons, to administer to the King, at their discretion, Electuaries, Potions, Syrups, Confections and Laxative medicines in any form that may be thought best; also Baths, Fomentations, Embrocations, Unctions, Plasters, Shavings of the head, Scarifications and a variety of other inflictions in the way of medical treatment."

The enumeration of preparations is interesting as showing those usually employed by the apothecaries of the time.

John Faceby was the favourite physician of Henry VI and attended the King during his lifetime, and on the occasion of his marriage with Margaret of Anjou he was granted a pension of a hundred pounds as a reward for his faithful services.

Similar awards were made to the Court apothecaries,

for, according to an entry in 1455, a grant for life was made to William Godfrey, the King's Serjeant, who combined the office of Yeoman of the Chamber with that of Apothecary to the King's person, and was also porter of Exeter Castle, Co. Devon, " to hold himself or by deputy with the usual wages, fees and profits."

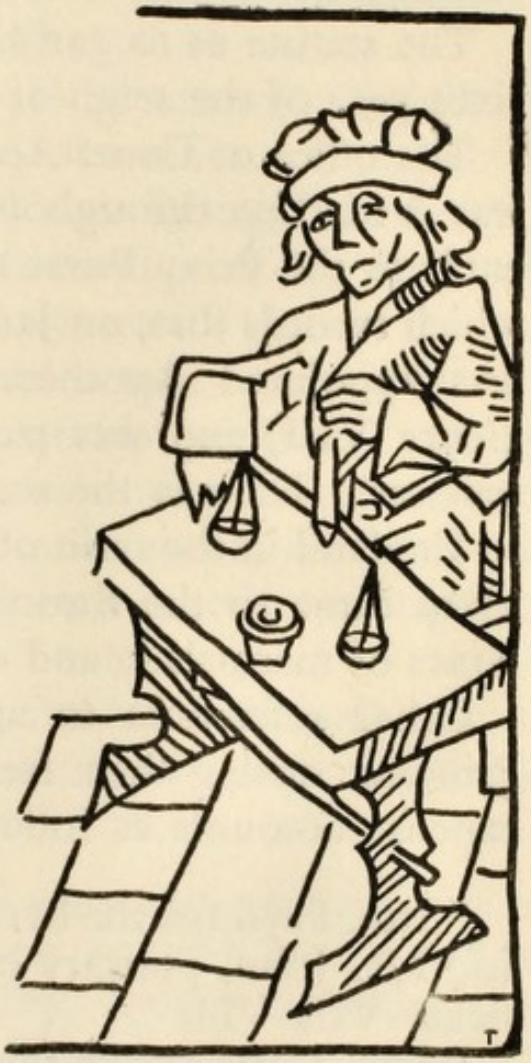
In the following year there is record of another grant being made to him as " garbler of all spices and drugs, and all merchandise which ought to be garbled in London, Southampton and Sandwich, to hold himself or by deputy; taking such fees as were wont to be taken in London heretofore on account of the office; so that no merchant expose for sale such spices, drugs and merchandise in the said city and towns, until the same are garbled, under pain of forfeiture thereof."

The office of Garbler in relation to the Apothecary is interesting and originated as follows:

Dissensions had arisen between the apothecaries, the spicers and grocers, at that time members of the same guild, which were probably due to the competition between them in the sale of similar wares. About the middle of the fourteenth century, the apothecaries accused the spicers and grocers of adulterating their goods while, on the other hand, the latter charged the apothecaries with similar malpractices.

In order to put an end to these disputes, in 1423, the Rector of the Grocers' Company and two apothecaries associated with him, were empowered to search the shops of suspected persons for adulterated drugs. When such drugs were found to be bad or adulterated, the apothecary or spicer was liable to be brought before the Mayor, and the drugs thrown into the street and trampled underfoot.

But evidently this did not put an end to the trouble, and with a view to detecting the adulteration before the goods reached the hands of the distributor, in the reign of Henry VI, letters patent were granted to the Wardens of the Grocers' Company giving them the exclusive right of Garbling, which meant the cleansing, separating and examining of the spices and drugs, in order to detect and prevent adulteration.



AN APOTHECARY WEIGHING
(From a woodcut, 1473.)

Certain drugs were required to be "officially garbled" before they could be exposed for sale, and this was generally carried out by the Garbler at the ports where they were landed.

The first record of this regulation being enforced occurs in the minutes of the Grocers' Company in 1456, when it is recorded, that a fine was imposed on one John Ashfeld, "for makynge of untrewe powder of gynger, cynamon and sawnders."

In 1561, the Wardens also record in their books that "bags and remantes of certain evil naghte pepper syrnamed gynger were to be burned," and many other entries show how the official Garbler carried out his duties. In one of the later accounts it is stated that

Mr. Lownes, Apothecary to Prince Charles in 1612, complained to the Company, that Michael Eason, a grocer-apothecary, "had supplied him with divers defective apothecaries wares," and the offender was in consequence committed to the Poultry Comptoir.

The statute as to garbling remained in force until the sixth year of the reign of Queen Anne.

The office of Court Apothecary is an ancient one and was carried on throughout Tudor times, as shown in an entry in the Privy Purse expenses of the Princess Mary, which records that, on January 29th, 1537, John de Sodo was appointed Apothecary to the Princess by King Henry VIII, and was paid forty marks a year for his services. He was the son of John de Sodo, who came to England in the train of Katherine of Aragon. When Mary came to the throne, he presented her with "six boxes of marmalade and cordials as a New Year's gift."

Other references to apothecaries who attended the Princess during her frequent illnesses occur in the expense accounts as follows:

"Itm. Payd for the hyre of a Barge for Doct^{r} Mychaell and Mr. John, poticary comyng to my ladys gce beyng sicke. VIIs VId.

"Itm. Geun to Mr John poticary XVs."

These no doubt referred to John de Sodo.

Another entry referring to a Court apothecary in the Privy Seals records of the fifteenth century is one dated February 16th, 1462. It states that "John Clerc, apothecary of the City of London, was appointed for life by King Edward IV to be the King's Apothecary, receiving 8*d.* daily for his fee from the issues of the

county of Devon, and a robe of the King's vesture yearly at Christmas at the Great Wardrobe."

Hugh Morgan, who called himself "Pharmacopœus," was appointed apothecary to Queen Elizabeth, and there is record of a bill rendered by him for a quarter's supply of drugs amounting to £83 7*s*. 6*d*.

The items include a "Royal sweetmeat 16 pence, Rose water for the French Ambassador 12 pence, a conserve of barbarries for Sir Walter Raleigh 6 shillings, and scent to be used at the christening of Sir Richard Knightley's son 2 shillings and sixpence."

In 1562, when the Apothecaries were freemen of the Grocers' Company, they were strictly enjoined "not to use or exercise any drugs, simples or compounds or any other kynde or sortes of poticarie wares, but such as shall be pure and perfyt good," an injunction which was probably very necessary.

James VI of Scotland, with fatherly solicitude of his subjects, granted a charter to the city of Glasgow in 1599 in which it was provided that :

"Na manir of personis sell onie droggis within the citie of Glasgow, except the same be sichit be the said is visitouris, and be William Spang, apothecar. under the pane of confiscatoune of the droggis.

"Nane sell retoun poison, asenick or sublemate, under the pane of ane hundred merkis, except onlie the apothecaries quha sall be bund to take cautioun of the byaris, for coist, skaith and damage."

These visitors were further empowered to inflict punishment on those who disregarded these regulations. This charter embodies the earliest known restrictions on the sale of poisons in Great Britain, and these powers

were confirmed by "Charles, King of Great Britain, France and Ireland."

Coming to the time of the Stuarts, we find that James I appointed several Court apothecaries, the first of whom was Adrian Metcalfe, who held the appointment in Scotland and came south with his royal master. John Parkinson, the author of the "Theater of Plants and Herball" and "The Garden of Plants," was made "Herbal Apothecary to the King," and Gideon de Laune, afterwards one of the founders of the Society of Apothecaries, held the office of "special apothecary to his Majesty."

Among the apothecaries to the Court of Charles I was Francis Metcalfe, a son of Adrian Metcalfe who had been apothecary to James I. He was made an honorary burgher of Aberdeen at the same time as Dr. William Harvey, on August 30th, 1641.

A story is told that once when travelling in the country with Dr. James Chalmers, a brother Scot, who was a Court physician, they stopped at a village inn and made loud complaints of the poor accommodation offered. Another traveller who rode up, heard them and remarked to Chalmers, "Sir, when travelling in your country I have been unable to find any accommodation for three days either for myself or my horse." Considering this observation an insult to Scotland, to which he and the King belonged, Chalmers arraigned the traveller before the Court of Star Chamber, but the result of the proceedings is not recorded.

Charles I appointed three other Court apothecaries. The first was George Shires, who was "apothecary to the King," and the second Isaac Wolfe, who was made

"apothecary to the Queen's household." They both received £60 a year for their services, but Wolfe was also allowed his diet and an allowance of six shillings and eightpence a day. According to the State Papers, on November 6th, 1627, payment was ordered to be made to him for "physical and odoriferous drugs supplied to the King." The third apothecary appointed to the King's household was Stephen Chace, and his wife held the curious post of "Rocker of the cradle" to the Royal children.

Charles II not only had his Court apothecaries but also a chemist and a herbalist.

After the Restoration, reference is again made in the State Papers to Francis Metcalfe, described as apothecary-in-ordinary to the Household. He petitioned that "he might continue in the office to which he had been sworn eighteen years previously." He stated that "he had lost his wagon of medicines at Naseby and had his office plundered at Whitehall. Not having ten pounds left in the world, he was forced to compromise his liberty and his livelihood, but had ever remained loyal."

But there was a rival in the field, for we find that George Solby, at the same date, petitioned for "confirmation of the position as apothecary to the Household, to which he was appointed in Brussels on February 20th, but from which one Metcalfe tried to displace him and had offered him £200 to relinquish his right."

Apparently Metcalfe was suspended for a time, as the dispute was not settled until August 1661, when he was re-sworn.

A little later he petitioned for arrears of salary amounting to £2,000, stating that he was originally appointed

in 1639 by King Charles I, and that his father, Sir Francis Metcalfe, had suffered in the late war.

Solby was also reappointed on January 24th, 1662, and the King requested the Barber-Surgeons' Company to supply him with an outfit.

Stephen Chace, who had been apothecary to Charles I, was also reappointed after the Restoration, and in 1666 his son John was appointed apothecary at a salary of £115 a year, and the reversion of the post to his son James.

Three years later we find John Chace applying for arrears of salary and £4 19*s.* 6*d.* a month for " laboratory fuel."

John Chace is mentioned in the Draycot Manuscript, which gives a vivid account of the last illness and death of Charles II.[1] His son James remained Court apothecary until 1727.

Another Court apothecary of the time was John Jones, who received a salary of £60 a year and £12 for board wages. In June 1667 he petitioned that his son should succeed him as in the case of Stephen Chace, and this was granted. Jones was a candidate for the Mastership of the Society of Apothecaries in 1673, but was not elected. He afterwards presented the Company with a portrait of King Charles I.

On May 12th, 1671, Dr. Christian Harrell was appointed apothecary to the Household with a salary of £40 a year. He had been sworn in on April 6th, 1669, as " apothecary and operator " in place of Dr. Lefèvre, and also as " Professor of Chemistry to the King," with a salary of £15 a year, which was increased on May 12th, 1671, to

[1] See " Mysteries of History," C. J. S. Thompson, p. 130.

£40 a year. Harrell became a Fellow of the College of Physicians in 1685, and attended Nell Gwynne in her last illness, for which "he received from Mr. Child, the banker, a cheque for £109."

Lefèvre, a French chemist who instructed the King in chemistry, also held the appointment of apothecary. He was made an Honorary Fellow of the College of Physicians, where he gave a course of lectures on chemistry, which Evelyn in his Diary tells us he attended in 1646.

Robert Morison was appointed Botanical physician and chief Herbalist to the King in May 1660 in place of John Parkinson. He had charge of the Physic Garden in St. James's Park, and was also Overseer Director and Gardener of Hampton Court and the Privy Gardens at St. James's, for which he received a salary of £200 a year.

Evelyn in his Diary, July 11th, 1675, states that he went to the Physic Garden to hear a lecture given by Dr. Morison.

A new Court appointment was created by Charles II for Thomas Williams, who according to the State Papers, in 1660, was made "Chemical Physician to the King."

The warrant creating his office states, that "it was awarded through His Majesty wishing to encourage so important an art, after hearing of the extraordinary power and skill which Dr. Williams had shown in compounding and inventing medicines, some of which have been prepared in the Royal presence." He was further given leave to make all experiments in His Majesty's Royal Laboratory.

Williams received a salary of twenty marks a year and was granted the degree of Doctor of Medicine at Cambridge. He is probably the Dr. Williams to whom

Pepys refers in his Diary, September 11th, 1661, who had a wonderful dog that killed the cats that worried the birds.

There is record of two other apothecaries who held appointments at the Court of Charles II, viz. Archibald Graham in 1662 and Alexander Hay in 1681.

James St. Armand held the office of Court apothecary to James II. He was present at the birth of the Prince of Wales, and it was he who probably made the "black cherry water to which Sir Thomas Witherley added the two drops of the child's blood." He was elected Master of the Society of Apothecaries in 1687.

The first appointment of a Royal chymist, as far as is known, was that of Mr. Townshend, who early in 1686 was gazetted " Chymist to the King."

In the time of Queen Anne, James Chace and Daniel Maltus held appointments as apothecaries to the Queen's person from 1707 to 1715, at a joint salary of £275 13*s.* 4*d.* a year.

William Jones, who succeeded his father John, also held the post of apothecary to the Household, for which he received £200 a year, and in 1718, Graham was appointed in place of Maltus.

When Richard Walker was appointed King's Apothecary to George IV in 1820, he claimed, in accordance with an ancient right, a seat upon the Court of Assistants of the Society of Apothecaries. The claim was challenged, but was eventually proved to be well founded and he was allowed to take his seat.

On his death, a Mr. Nussey was appointed to the post in 1825, and he was succeeded by Mr. Edmeades, who attended the Princess of Wales when she resided at Montague House, Blackheath.

CHAPTER VIII

THE ART OF THE APOTHECARY IN EUROPE IN THE MIDDLE AGES

THERE is evidence that apothecaries' shops for the sale and compounding of drugs existed in Italy as early as 1140, and in France there is a charter of a church at Cahors dated 1178, in which apothecarii are mentioned. In the thirteenth century, John of Garlande alludes to "appotecarii" who sold confections, electuaries, roots, herbs, ginger, pepper, cummin and other spices, wax, sugar and liquorice.

In Bruges in Belgium, a corporate body including the apothecaries and vendors of drugs, which had its own hall, seal and statutes, was founded in 1297. A chapel was attached to the hall where service was daily celebrated, and new members were admitted and sworn in. The apothecaries of this body had the exclusive sale of drugs as well as other commodities.

There were smaller or what may be called sectional guilds at even an earlier period, for in the ninth century, the ointment-makers of Constantinople had become organized and were under government control. There were fixed penalties for fraud, for using unstamped and unlawful measures, and for the infringement of the coinage laws. The penalties for these offences included

expulsion from the guild, corporal punishment, banishment from the city or shaving of the hair.

In the thirteenth century, a course of instruction was laid down for the apothecaries of Montpellier by their guild, which framed its own laws and kept a careful watch to see that the rights of its members were not encroached upon.

Frederick II, the Holy Roman Emperor and King of Sicily, who was one of the chief promoters of the medical school of Salerno, promulgated laws to regulate the practice of the apothecaries' art in 1224. According to these regulations, the apothecaries were enjoined to keep their drugs at their own cost, and in the prescribed method, which fact had to be certified by the physicians and confirmed by oath. Contravention of this law was punished by sequestration of goods and, in serious cases, by death.

Apothecaries' shops could only be kept at places designated by the authorities throughout the kingdom, and the prices charged for drugs were regulated.

For such drugs and simples as were preserved for not more than one year from the day of purchase, the apothecary might demand about ninepence an ounce, but for such as were preserved more than a year he could demand about four shillings and eightpence an ounce.

That the physician and the apothecary carried on their practices separately, is evidenced from the oath that the school of Salerno required its graduates to swear, which forbade the former to enter into partnership with an apothecary, or himself to keep an apothecary's shop.

Inspectors were appointed to supervise the preparation of medicines and to attest their satisfactory character by

certificates, while the apothecaries were directed to prepare the recipes or prescriptions of the physicians at a stated price.

In Paris in the fourteenth century, apothecaries were required to swear the following oath before they were allowed to practice :

"I swear and promise before God, Author and Creator of all things, one in essence and distinguished in three persons, everlastingly blessed; that I will observe on every point all the following articles. And first, I promise to live and die in the Christian Faith; to love and honour my parents to the best of my ability; to honour, respect and serve, as far as in me lies, not only the doctors of medicine who have instructed me in the knowledge and precepts of the art, but also the teachers and the master-apothecaries under whom I have learnt my business; not to speak ill of my former doctors, master-apothecaries, or any one else.

"To do all I can for the honour, glory and adornment of medicine, not to teach its secrets and curiosities to idiots and ungrateful persons, to do nothing rashly without the advice of Physicians and only in the hope of gain. To give no medicament or purge to those labouring under any disease, without first taking counsel of some learned doctor; not in any way to touch the shameful and forbidden parts of women, unless in case of urgent necessity, that is to say when some remedy has to be applied to them. To disclose to no one any secret entrusted to me, never to give anyone any kind of poison to drink, nor to advise anyone to give such a potion even to his greatest enemies; never to give any abortive potion; never in any way to attempt to induce the expulsion of the fœtus from the belly of the mother, unless acting on the advice of the doctor. To dispense

exactly, without adding or leaving out anything in the prescriptions of the doctors, as far as they are in accordance with the rules of the art. To use no succedaneum or substitute without taking counsel of someone of greater knowledge than myself; to repudiate and avoid like the plague, the scandalous and utterly pernicious methods of practice now employed by empirical charlatans and alchemists, to the great shame of the magistrates who tolerate them; to give help and succour alike to all who shall employ me, and lastly to keep no bad or old drug in my shop.

"May the Lord bless me always, as I shall observe these things."

There is record of apothecaries' shops at Wetzler in Germany in 1233, at Schwernitz in 1248, at Würzburg in 1276, at Augsburg in 1285, at Esslingen in 1300 and at Frankfort-on-Main in 1343. In the archives of the city of Augsburg, mention is made of one "Suitfred, Apotheker," as being resident there in 1285, and also "Hans, Apotheker," as being city chamberlain in 1317. As similar names occur in the early annals of other German towns, it is possible that, if these persons were not actually apothecaries themselves, they had derived the appellation from a member of their family who had practised the art.

It is not, however, until the beginning of the fifteenth century that there is conclusive evidence that apothecaries' shops were established in several cities in Germany at the public expense.

These State apothecaries, as they were called, were exempted from all parochial duties, and furnished with a house and a certain annual quantity of wine and corn, for which they were in some instances bound to supply the

magistrates with a specified portion of confectionery at their public meetings.

From an ordinance among the police regulations governing the city of Basle in 1440, it appears that the apothecaries dispensed the ordinary medicines to the public, free, either in consideration of their salary or at the expense of the State.

In the same year it was also decreed that a physician should be established in every Imperial city, with the allowance of an ecclesiastical benefice, in order that he might give advice without fee, and that "such costly articles as persons might choose to have from the apothecary's shop they should pay for."

These shops, however, were so few that it was not until 1488 that one was opened in Berlin. In that year it is recorded that the magistrates granted to one Hans Zekender the hereditary right to practise there, together with the privileges and allowances already mentioned, and an engagement that no other apothecary should be allowed to reside in the city. Hanover had no apothecary's shop until 1560, nor the Court of Dresden until 1581, and it is remarkable that both of these were established and supported by women; the first by the reigning Duchess and the other by the Electress Ann.

A knowledge of medicine formed indeed a part of the accomplishments of the great ladies of the period, and a woman was appointed public apothecary at Augsburg in 1485.

In Holland, there is record of one Theodorius, an apothecary in 1320, and also of a State Apothecary at Zwolle in 1341, while at Dordrecht and Gröningen there were apothecaries' shops about 1360.

In Italy, there were several laws enacted regulating the practice of the apothecary in the fourteenth century. The earliest known is a Statute of Florence dated 1313–1349 which stipulates, that in medicines in which honey is prescribed, sugar must not be used as a substitute.

In Brescia, examinations were demanded from those who desired to practise as apothecaries as early as 1453, and in Sienna it was enacted, in 1365, that no one who had not passed an examination should keep an open shop

AN APOTHECARY DISTILLING IN HIS LABORATORY
(From a woodcut, 1530.)

for the sale of medicines. The same statute also restricted the sale of arsenic sulphide and corrosive sublimate (perchloride of mercury) to the principal or responsible person in charge of an apothecary's shop. Such poisons were not allowed to be handed to any slave, whether freed or otherwise, nor to any servant, child or youth under twenty years of age, but only to adults who were well known to the vendor.

In 1378, according to a Statute passed in Perugia, no poisons could be sold without the express permission of a physician or veterinary surgeon, and the permit must state the purpose for which the poison was to be used.

A law was passed in Mantua in 1401, prohibiting the substitution of one drug for another, and a similar Statute was enacted in Genoa in 1438, demanding that no medicament should be substituted for another without the physician's permission. The apothecary was further enjoined to be careful that " honey was not substituted for sugar and to see that the latter should not serve as a cover for the former, also that he should put neither rice nor starch in anything composed of sugar in whole or in part."

In Palermo there was a law passed in 1513, prohibiting poisons being sold to persons unworthy of trust, and the Faculty of Medicine demanded an apprenticeship of six years, to be followed by an examination, to all who wished to practise as apothecaries.

While the fierce struggle of centuries was still being carried on in Spain between the Moors and the Christians, special guilds were being formed in the large cities, and among them the apothecaries figured. In Cordova, where the Arabs had established apothecaries' shops early in the thirteenth century, the laws regulating their practice were probably similar to those enacted at Salerno.

There was a guild of Apothecaries and Grocers in Barcelona about the same period, and in 1327 Don Alfonso gave the boticarios or apothecaries of Valencia the right to examine and to receive or refuse all those wishing to practise the apothecary's art throughout the kingdom.

In the Charter of Don Martin in 1407 it is mentioned that no apothecary or grocer was to make syrups or mixtures without being examined, and that the examiners

were to include physicians, together with two master apothecaries or grocers.

According to a decree made by Alfonso X, apothecaries who dispensed scammony or " strong medicine " without a physician's prescription were liable to be tried for homicide if fatal results followed.

There was a curious work published in Salamanca in 1498, written by Francisco Lopez de Villalobos, in which he describes the action of various drugs and preparations in verse, and in it he mentions decoctions, ointments, plasters and electuaries, and shows the position to which the art of the apothecary had attained in Spain in the fifteenth century.

The monks, who did much to keep the torch of science alight during the Dark Ages, also played an important part in the development of the art of the apothecary. Their work in tending the sick and infirm naturally led them to the practice of medicine and, in the monasteries, the healing of the body was linked with the healing of the soul. The brethren of some of the orders included many of the greatest scholars of the time, and they studied the works of the early writers on medicine from the manuscripts in their libraries, to which they were continually making addition. Their scribes copied the works of masters borrowed from other libraries, and manuscripts were acquired from Greece, Italy, Salerno and Arabia. At times, some erudite man from the outer world would enter the order and bring with him his love for science which had become a second nature to him, and thus the influence of his knowledge was felt in the monastery. Many instances might be given of the monks associated with science and medicine, such as

Roger Bacon, Gilbert, and Bernard Gordon, whose names will ever be remembered.

In the fourteenth century, nearly every monastery of any size in Europe had its physician and pharmacy, together with a hospital or infirmary for tending the sick and infirm. If an epidemic broke out, the people sought the monks for aid and treatment, and they were practically the only source of relief in most parts of the country.

Acting under the direction of the monk-physician was the apothecary or pigmentarium, in whose care was placed the armarium pigmentarium, or the cupboard in which the drugs and spices were stored. Saladin of Asculo, physician to the Prince of Taranto, called the monk-apothecaries, aromantarii. It was the function of the apothecary to prepare the medicines and administer them to the sick under the supervision of the monk-physician; together they had charge of the hospital and infirmary of the monastery and gave aid to the sick and injured who came to their doors.

As time went on and greater demands were made on their healing services, the armarium pigmentarium used for storing the drugs became too small to hold the constantly increasing number of remedies which had to be employed, and so the monastic pharmacy came to be established, with its drugs jars and vessels of beautiful pottery, often made by the most famous potters, and decorated by artists of high repute.

An adjacent room was sometimes equipped as a laboratory, where the stills were erected for the distillation of aromatic and cordial waters for which many of the monasteries became famous. It was in such a labor-

atory the monks of the Benedictine order distilled their famous liqueur and the waters of melissa and mint, which are still made to-day at the Abbey of Fécamp.

The materia medica of the monastic apothecary was mainly drawn from the vegetable kingdom, and, at first,

APOTHECARY DISTILLING AROMATIC WATERS
(From a woodcut, 1531.)

the neighbouring woods and fields furnished most of the herbs and simples he employed, but, later, the monks began to cultivate the plants which had been proved from experience to be most effective, in their own physic gardens. Here they grew rosemary, rue, sage, marsh-mallow, savine, fever-few, peppermint and other herbs,

the medicinal properties of which they knew and favoured. In a Capitulary of a monastery of the thirteenth century, in addition to these, mention is made of aniseed, caraway, cummin, coriander, fennel, laurel and mustard, all of which they cultivated and utilised in making their remedies.

The preparations chiefly employed by the monk-apothecaries were the simple infusion or tisane, or the potion, while the collyria, plasters and ointments were used as external applications.

When a certain formula was found to be specially efficacious, they guarded it carefully as a precious secret, and even the compounding of it was surrounded with great mystery.

Prayers were sometimes repeated before administering the medicines and certain saints were invoked for their aid in healing. Thus patron saints came to be connected with various diseases, and to them special supplications were addressed. St. Hilary was besought while attending to a fracture of the arm, and those suffering from stone craved the aid of St. Liborius. St. Louis was invoked for diseases of the ear, St. Clare for ailments of the eye, St. Geneviève in cases of fever, St. Blaise in throat trouble, St. Antony for erysipelas, St. Benedict in cases of inflammation, St. Roch for the plague, and other saints became associated with certain diseases.

From the eleventh to the thirteenth century, some of the bishops practised medicine with considerable success, and owing to their special knowledge were allowed to exercise the right of granting diplomas to practise, a custom carried on by the Archbishops of Canterbury down to recent times.

Close to the pharmacy in some monasteries, a small room was set apart for the "cupping" brother or minutor, where he might carry on his operations. In certain orders, the bleeding of the whole monastic community was enjoined five times a year, which, together with the numerous lay patients who applied for similar attention, caused the minutor's office to be no sinecure.

CHAPTER IX

METHODS OF ADMINISTRATION FROM PAST TO PRESENT

OF the various methods of administering drugs which have been employed throughout the ages, as might be expected, some are now completely obsolete and their meaning is forgotten, while others, like the pill, the ointment and the plaster, have survived and remain with us to-day.

The pill of all other methods devised for preparing medicines for internal use has apparently ever been the most popular. Although not the earliest form of preparation known, it is of considerable antiquity, and can be traced back over a period of 1,500 years before the Christian era.

Pills appear to have had their origin in the electuary, a mixture of certain drugs in powder, combined with honey and brought to the consistence of a soft paste.

The Papyrus Ebers contains several formulæ for electuaries, usually directed to be taken in small pieces, the size of a lentil. It is quite probable that such fragments may have been rolled between the fingers into a spherical form to aid deglutition.

Electuaries appear to have been a favourite method of preparing drugs with the early Greeks. As these preparations were so nauseous to take, it apparently

became the custom to roll a small quantity into a little ball which was swallowed whole, and the instructions generally given were to take a piece the size of a bean.

A form of medication called Catapotia by the Romans, and described by Celsus (A.D. 50) was of the same consistence as an electuary, and in the directions given for their administration he states :—" The size of a lentil is sufficient to be taken." " Take a piece the size of an Egyptian bean." " The dose is as much as may be taken up upon the point of the finger."

The Egyptian bean seems to have been taken as a standard, although Galen later on alludes to a dose being taken " the size of a dried pea," and other writers record the " size of an almond, an Egyptian bean and coccus, or lentil bean."

By this time a name had been given to the fragments which represented a dose of the medicament, and we find the names Globulus and Glomeramus, taking the place of Catapotia. Pliny (*ca.* A.D. 50) was probably the first to use the word Pilula, to which he refers in the passage " Pharmaca illa in globulos conformata vulgo pilulæ meminamus."

In the Syriac Book of Medicines, a number of formulæ for pills are included, and the instructions for making some of them are interesting.

Some pills prescribed for shortness of breath and asthma, which contained sulphur, absinthe, incense and other substances, are directed to be " pounded and worked up with vinegar and made into pills the size of beans." Another direction is to make the mass into pills about the size of peppercorns, while in other cases pills the weight of two drachms are ordered.

Among the formulæ for pills, which number twenty, in the Syriac manuscripts, one of the most curious is that for Lambs' Tongue Pills, the ingredients of which were not so innocent as the name would imply. They were composed of burnt pepper, burnt copper, verdigris, smelter's dross, tincture of arsenic, unslaked lime, crocus and opium. These ingredients are directed to be thoroughly

AN APOTHECARY AND HIS APPRENTICE PREPARING DRUGS

crushed and mixed with extract of lambs' tongue, and made into pills, each containing four drachms.

The name Pill Cocchia, which is still applied to pills of colocynth and aloes, was originated by the Greco-Roman physicians.

Another ancient formula is that for Pil. Rufi, which is now known as the pill of myrrh and aloes. It was originally a Hiera, that is, a mixture of drugs in powder,

usually containing aloes, or colocynth, like the Hiera Picra. It is said to have been invented by Rufus of Ephesus, who lived in the reign of Trajan. The Hiera of Rufus was first prepared in the form of pills by the Arabs, and was called by Avicenna, Pilulæ Pestilentiales.

Writing in the thirteenth century, Actuarius states, "What the Greeks called Catapotia, the Romans know as Pilulæ."

Only four formulæ for pills are given in the "Antidotarium" of Nicolas the Salernitan, written in the fourteenth century, but in the "Dispensarium" by Nicolas Prepositus, which was first printed in 1490, there are sixty-one formulæ for pills, some of which contain a large number of ingredients. Among these are the Pill Agregator, which contains twenty-eight different drugs.

In the first official Pharmacopœia, the Nuovo Receptario Compostum, published in Florence in 1498, there are fifty-one different formulæ for pills. As time went on the pill appears to have become still more popular, until we find in the edition of "Pharmacopœia Universalis," printed in 1833, no less than 234 different formulæ are given.

The earliest mention of pills in English literature is in Caxton's "Fable of Poge," which was printed at Westminster in 1484. In this work he alludes to a "phisycyen who had a seruaunt whiche made pylles." During the fifteenth and sixteenth centuries in English literature, the word is variously spelt pylle, pille, pyll, pil and piele.

Concerning the dosage of pills Francesco Manetti says:—"It has been observed by physicians in the fifteenth century and earlier, that uneven numbers such

as 5 or 7, given in pills or potions, are more efficacious than even numbers, in the treatment of their patients." This ancient tradition concerning the number 7, which was regarded as sacred, can be traced back to the early incantations used in connection with the treatment of disease over a thousand years before the Christian era.

In the fifteenth and sixteenth centuries the method of working drugs into a pill mass was usually by manipulation with a spatula on a slab or piece of marble.

The mass was then rolled and cut into pieces and moulded in the fingers according to the size required. In the seventeenth century, the London apothecaries used a pill tile or slab for this purpose, which was either square, octagonal or heart-shaped. These tiles, known as apothecaries' pill tiles, were made of London delf, and usually bore the arms of the Apothecaries' Society in blue or polychrome.

The pill tile survived until the middle of the nineteenth century, when some were made with a graduated scale on the surface indicating the divisions for cutting the rolled mass into six or twelve 5-grain pills.

As drugs of a more powerful nature came to be employed in medicine, it became necessary to secure greater accuracy in dividing, than by mere guessing with the eye. Pills were made smaller and from the size of a bean were reduced to five grains or less in weight.

The graduated pill divider came into use at the end of the seventeenth century, and was made of a flat piece of brass or steel with a dentated edge on both sides, by means of which the rolled mass could be marked for cutting into pills of the required size.

About the middle of the eighteenth century a combined

pill-cutter and divider was introduced. This had a blade about 7 inches long, the upper part of which was slightly curved and sharp on one side for cutting, while the lower part of the blade was divided into grooves for marking the divisions of the rolled mass before cutting. This implement had a wooden handle. A later type of pill-cutter consisted of a piece of wood about 9 inches long, in the centre of which twelve brass blades were fixed, and placed at equal distances for cutting the rolled mass.

The pill machine now employed was originally made entirely of wood, and appears to have come into use in the latter part of the eighteenth century, and with slight improvements has survived to the present day.

Some curious names are given to certain pills included in the Pharmacopœias of the sixteenth and seventeenth centuries. Among these may be mentioned the "Angelic Pill," which contained aloes, chicory, endive, fumitory, damask roses, rhubarb, agaric and cinnamon.

There were also the "Golden Pills," which did not contain the precious metal, as might be supposed, but were composed of aloes, scammony, rose petals, smallage, fennel, anise, mastic, saffron, Alhandel lozenges and spirit. These pills were celebrated for their reputed property of preserving the eyesight.

"Amber pills" was the name given to another famous formula consisting of amber, birthwort, mastic, ambergris and aloes.

Perhaps the most curious of all was the "Everlasting Pill," which is mentioned in Gray's Supplement to the Pharmacopœia as late as 1848. It consisted of a small globule of metallic antimony, which was believed to have the property of purging as often as it was swallowed.

Paris says, "We have heard of a lady who having swallowed one of these pills became seriously alarmed at its non-recovery. 'Madam,' said her physician, 'fear not. It has already passed through a hundred patients without any difficulty.'"

A mysterious pill was mentioned in the *North China Herald* some years ago. The account stated that rumours were being circulated that the Emperor of China was ill, and it was said that his illness was due to a certain Red Pill, which had been given to him by one of his ministers. This Red Pill was invented in the Ming dynasty, and whoever swallowed it became subservient to the will of the giver.

The greatest pill-taker on record appears to have been one Jessup, a worthy grazier of Hickington, who died in Lincoln in 1814 at the age of sixty-five. For twenty-one years he took pills at the rate of twenty-nine a day, which number he increased to seventy-eight towards the latter part of his life. In twenty-one years he is stated to have swallowed 226,934 pills and drank 40,000 bottles of mixture, which were all supplied by an apothecary of Bottesford, who sued Jessup for the bill at the Lincoln Assizes shortly before he died.

The fashion of taking Dinner Pills became common in the late eighteenth and early nineteenth centuries. Dinner Pills were generally composed of aloes, mastic, extract of wormwood and other ingredients. Many of the fashionable physicians of the period had their special formulæ for these pills, which they prescribed for their lady patients. The latter were apparently so pleased with their action and efficacy, that they recommended them broadcast to their friends, and so the pills became

associated with the name of the ladies for whom they had been originally prescribed. Thus we have the pills of Lady Webster, Lady Hesketh, Lady Crespigny and many others.

The coating of pills with gold or silver leaf is said to have been originated by the Arabs in the time of Avicenna and is thought by some to have been done not so much to

AN APOTHECARY AND HIS ASSISTANT PREPARING HERBS
(From a woodcut, 1538.)

render them tasteless, as for the medicinal properties of these precious metals. Pill coating with sugar does not appear to have been originated until the latter half of the nineteenth century, and this was followed by coating with gelatine or with French chalk. From that time, pill coating has developed into quite an art, and has practically become an industry.

Among the methods of administration now almost obsolete, some are interesting on account of their derivation and antiquity. Of these the lohoch, which is vari-

ously termed in early manuscripts on medicine as looch, loch, lohoth, looth or lohot, and which is derived from the Arabic *la'aka*, to lick, may be mentioned. It was a thick semi-liquid of a consistency between that of a syrup and an electuary, which was to be licked with the tongue from a spoon. In the eighteenth century this preparation was sometimes called a linctus, and is a form of preparation still employed in Holland.

Another preparation was the rob, which was usually composed of the juice of some ripe fruit mixed with honey.

Acopon was the name given to a stimulating anodyne liniment, a little thinner than an ointment, while the apozem, a form of medication still employed in Switzerland, was a strong decoction or infusion of a vegetable drug in water.

Cerates were applications similar to ointments, but made harder by the addition of wax, and Collutories were preparations about the consistency of honey, for application to the gums and mouth. The name collution was also sometimes applied to a liquid mouth-wash.

A Conserve consisted of one drug only incorporated with sugar, while an Eclegma was a thick syrup given in conjunction with a stick of liquorice to suck, with the object of relieving a cough.

Juleps were liquid preparations, generally sweetened, which were popular in the seventeenth century, and Marmalades were medicinal conserves of various fruits the pulps of which were preserved in sugar. Suffuments were mixtures of aromatic gums and other substances, which were to be slowly burned and the fumes inhaled, while Species consisted of a mixture of drugs in powder

which were kept ready for incorporation with honey or treacle and so made into a bolus or electuary when required.

The Bolus was prepared of a stiffer consistence than the Electuary, and was swallowed in pieces about the size of a pea, while Siefi were preparations of drugs ready to be mixed with water for application to the eyes.

CHAPTER X

THE BOOKS OF THE EARLY APOTHECARIES

THERE were two classes of works which influenced the art of the apothecary and to which he looked for knowledge and guidance in the early centuries of the Christian era. In the first group may be placed the Antidotaria, which were mainly collections of recipes or lists of the drugs employed in healing, and were the forerunners of the pharmacopœias. The earliest compilations of the kind were the "Commentarium Medicinale" of Benedictus Crispus of Milan (735), the "Hortulus" of Walafrid Strabus (807–849), and the works of Isidore of Seville of the sixth century. But others of greater importance emanated later from the famous medical school of Salerno.

The first of these, the "Regimen Sanitatis," was written about the end of the eleventh century, and remained a popular guide to health for over six hundred years. It chiefly consisted of regulations for the preservation of health by means of diet and rules of living, and tended rather to discourage the use of drugs than otherwise, as expressed in the last line of the work:

"God graunte that physicke you may never neede."

The remedies mentioned in it, with the exception of three or four, were prepared from the following herbs

and simples: sage, fennel, marsh-mallow, primrose, lavender, green-willow, rue, hyssop, cinque-foil, penny-royal, the root of elecampane, mustard seed, black pepper and saffron.

Of the few remedies recommended which included mineral substances, there is one for fistula, the formula for which consists of arsenic and sulphur mixed with lime and soap. A recipe of interest is one mentioned under the head of " De Salice " (concerning the willow), in which it is stated that " this bark treated with hot vinegar dissolves warts."

It is only within recent years that salicylic acid derived from the willow, when mixed with collodion, has again come into use as an eradicator of warts or corns, and its properties rediscovered after a period of nine hundred years.

The " Antidotarium " written by Nicolas of Salerno about 1140, was another work dealing with drugs and the substances then used in medicine.

In a manuscript copy of this work written about 1300, only five methods of administration are mentioned, viz. electuaries, fumigations, plasters, syrups, and ointments, but in a copy of about a century later, recipes for confections, oxymels, potions, lozenges and emetics are included. It also contains prescriptions useful for various diseases, a short treatise on wines, formulæ for the oil of roses and oil of mandragora, together with three recipes for making Hiera Picra.

Nicolaus Myrepsus, who was born at Nicæa about 1250, and who also studied at Salerno, was the author of an " Antidotarium " which contained 2,666 formulæ. This work was a popular text-book with all who studied

medicine in the fourteenth and fifteenth centuries, and among the chemicals mentioned in it are sodium chloride, mercury and sal ammoniac.

It was not printed until 1541, after which it passed through several editions and was included in the collection of his works by Leonardo Fuch, printed in 1549 under the title of "Medicamentorium Opus."

"Liber de Simplici Medicina" of Joannes Platearius, which was written about the twelfth century and generally known as "Circa instans," was also a vade mecum of the apothecaries and remained in use for centuries. It was printed in 1517.

Besides these works there were the "Antidotarius" of Johannes Damascenus, the "Antidotarium" of Guinarius which was first printed in Louvain in 1473, and the "Antidotarium" of Petrus Montagnana about 1476, all of which were highly esteemed throughout Europe.

The "Compendium of Medicine" written by Gilbert Anglicanus, a monk of the thirteenth century, gives particulars of the preparation of oil of tartar per deliquium and mentions solution of ammonium acetate, thus anticipating Mindererus by some four centuries.

He describes at length the manner of extinguishing mercury to make an ointment, and recommends the addition of some mustard seed to facilitate the process. Some of Gilbert's formulæ survived several centuries and were included in the first London Pharmacopœia.

John of Gaddesden, physician to Edward II and Professor of Medicine at Merton College, Oxford, deals very largely with drugs in his work "Rosa Anglica," probably written between 1310 and 1320. His formulæ

chiefly consist of animal and vegetable substances practically destitute of medicinal properties, and serve only to show the low condition to which the art of healing had sunk in this country in the fourteenth century.

Another well-known work, probably written about 1307, was the " Lilium Medicinæ " by Bernard Gordon; it is, however, mainly a compilation of the early Arab writers and shows little or no originality.

A work of greater interest is the " Brevarium Bartholomei " which was written by John Mirfield in the latter part of the fourteenth century. He was resident in the Convent of St. Bartholomew of Smithfield, the Priory established in the reign of Henry I by Rahere, who also founded St. Bartholomew's Hospital.

The " Brevarium Bartholomei " is his greatest work, which has been described in detail by Sir D'Arcy Power, and is interesting as being the first book on medicine connected with the oldest hospital in London. In it he deals with fevers, affections of the head, neck and throat, and describes both simple and compound medicines.

He observes that a person may be preserved from plague infection by smelling and swallowing musk, aloes wood, storax, calamint, amber and other aromatics. He issues warnings against over-feeding and drinking, and recommends syrup of vinegar to be taken in the morning and syrup of violets at midday, mixed with cold water.

Brother John Helme, probably one of the brethren of St. Bartholomew's, recommended, against plague, a mixture of aloes and myrrh to be taken in warm wine. Warm bread is also recommended, as a few morsels of it are said to prevail against pestilential air.

If there is any uncertainty about the patient being alive

or dead, Mirfield directs the application of a little burnt lard to the nostrils. "If alive," he says he finds the patient thereupon will scratch his nose.

Many of his remedies, as might be expected, are a curious mixture of medicine and religion. Thus, for rheumatism, he recommends the affected part to be rubbed with olive oil. This was to be put into a clean vessel, whilst the apothecary made the sign of the cross and said two prayers over it, and when the vessel was put on the fire, the Psalm "Quare fremuerunt gentes" was to be said as far as the verse "Postula a me dabo tibi." The *Gloria* and two prayers were then to be said, and the whole repeated seven times.

There was a reason for this, as it should be remembered that in Mirfield's day, clocks were scarce and watches unknown; the time was therefore measured by the minutes required for repeating prayers or verses. It has been ascertained that this particular formula required fifteen minutes to complete.

An important work by Master Querico de Augustis de Terthona, who is said to have been a physician of Vercelli, although Philippe calls him Quiricus de Augustis de Tortona of Milan, was written in the fourteenth century. It is largely compiled from manuscripts of an earlier period and must have been a work of great usefulness to the apothecary. The first dated edition of this book, which is entitled "Lumen Apothicario," was printed in Turin in 1492.

It is notable for the many methods of preparing the drugs described which include confections, electuaries, solutions, lozenges, powders, lochs, syrups, ointments, plasters, oils and pills. From the number of formulæ

he gives for pills, twenty-eight in all, it is evident that the pill had become a favourite form of administering medicine in the fourteenth century.

Terthona appears to be the first to mention "mixtures" in liquid form, and he gives formulæ for a "pectoral" and a "cordial mixture." He also describes the preparation of syrups, honeys, oxymels and juleps, and records the formulæ for twenty-three ointments and thirty-one different lozenges, including one of the earliest known recipes for making marzipan.

The book must have achieved considerable popularity, as it passed through seven editions before 1500.

Another work which was held in high esteem by the apothecaries at this period was the "Dispensarium Magistri Nicolai Prepositi ad aromatarios nuper diligentissime Recognitum," well known as the Dispensatory of Nicolas Prepositus or Privost of Tours. It also was largely compiled from manuscripts written by earlier authors and was first printed about 1490. Another edition was printed at Lyons in 1517 to which the "De Simplici Medicina" of Platearius was added, with other matter by Michaelem de Capella.

Prepositus divides his work into three books, in which he describes the preparation of vinegars, cerates, confections, clysters, conserves, electuaries, plasters, juleps, loothes (afterwards called looches) honeys, mucilages, oxymels, pills, potions, powders, robs, syrups, solutions, juices, suppositories, pomanders, treacles, lozenges, wines, ointments and sugars. This work is a serious endeavour to epitomize the knowledge of the apothecary in the fifteenth century and shows a great advance on other books of the period.

About the middle of the fifteenth century another work of considerable interest, but perhaps not so well known, was written by Saladinus, a graduate of the school of Salerno and physician to Giovanni Antonio de Balzo Ursino, Grand Constable of Naples.

It is entitled the " Compendium Aromatariorum " and throws a fresh light on the apothecary's art at the time. It was first printed at Bologna in 1488 and afterwards passed through several editions; the last, to which a commentary on the works of Mesué was added, was printed at Venice in 1559.

Saladinus, who evidently possessed an intimate knowledge of the art of the apothecary, first deals with the education and duties it was necessary to learn, and then gives instructions on the methods of collecting, preserving and manipulating drugs.

He furnishes an interesting list of the works which, he states, the apothecary should have in his library, and mentions " De Simplicibus " of Avicenna and Serapion, the Antidotarium of Nicolas, the " Circa Instans " of Platearius and the works of Dioscorides. He suggests the preparations that the apothecary should keep in stock, and mentions sixteen kinds of fats, seven varieties of gall, fifty-nine electuaries, forty-six waters, thirty-six formulæ for pills, twenty-seven for lozenges, twenty-seven oils, six conserves made with sugar and twelve prepared with honey.

He describes the proper kind of containers in which the apothecary's drugs and preparations should be kept, and recommends that they should be made of glass, lead, tin, iron, silver, gold or horn. He observes that, " they should have straight necks and be closed by

tying over the mouths with pieces of parchment, and sealing with pitch and wax."

He describes in detail the method of making pills, and says they should be made small and round, and warns the apothecary not to dispense them until they have become hard.

The pill mass is recommended to be kept in the form of a roll and not fashioned into pilular form until required; this was necessary in order that they should not readily lose their moisture.

DIOSCORIDES
(From a woodcut, 1538.)

In the second group of works associated with the art of the apothecary, mention must be made of the early manuscripts on botany which later developed into the herbals that became the popular books on domestic remedies.

The most important of these was the "Materia Medica" (things fit for medicine) of Pedacius Dioscorides, who flourished between the years 40 and 90 A.D. This remarkable work, which has already been mentioned, formed the basis of the majority of the herbals and books on materia medica for at least a thousand years.

There are very few manuscript copies of the works of Dioscorides in existence. The earliest and most beautiful is the Byzantine MS. now in the Imperial Library in Vienna. It is believed to date from the year 500 A.D. by the record it contains of its having been written and illuminated for the Princess Juliana Anicia, the daughter

of Flavius Anicius Olybrius, who was Emperor for part of the year 472, and his wife, Galla Placidia. The Princess Juliana Anicia died in 527 A.D.

The remarkable drawings in colour illustrating this manuscript were partly engraved in the reign of the Empress Maria Theresa, under the inspection of Jacquin. It is stated that only two impressions were ever taken from the plates, one of which was sent to Linnæus, with notes by Jacquin, and the other is in the Bodleian Library. The original manuscript has since been reproduced in facsimile.

Another manuscript of the work of Dioscorides, known as the Neapolitan, is quarto in size, and is stated to be even more ancient than the Byzantine manuscript.

The Bodleian Library contains several manuscripts of the works of Dioscorides, including a version in Arabic, and there is also another codex in the British Museum.

The works of Dioscorides were first translated into Latin and printed in 1478 by John Allemanns, which edition consisted of 102 pages, folio, but it was very imperfect. The next edition, copies of which are now extremely rare, emanated from the famous Aldine press of Venice in 1499. It contained the works of Dioscorides, together with Nicander's Theriaca and Alexipharmica, in Greek. The text of Dioscorides occupies 129 pages, and that of Nicander thirty-eight pages. But even this noble edition did not give a complete rendering of the work of the great early botanist, and in 1518 Aldus again printed an edition which contained many corrections and omissions from the former issue, and consisted in all of 235 pages.

It was not, however, until 1529 that the first complete edition of the work was printed in Greek and Latin by John Soter, a printer of Cologne. This book contains 753 pages of text, and is now rare. During the fifteenth and sixteenth centuries the work became the standard authority on medicinal substances, and edition after edition followed one another in rapid succession. It was translated into French and printed in Lyons in 1559.

A popular commentary on the work of Dioscorides was written by Matthiolus, which superseded all others. It was first printed in Venice in 1554, and was profusely illustrated with cuts of plants and animals. Further editions were published in Venice in 1558, 1565, 1569, and 1583, the best being that of 1565, in which the wood cuts are excellent. It passed through seventeen editions in all, and it has been estimated that 32,000 copies were sold before the year 1583. Another French translation was published in Basle, which was also well illustrated, in 1580, and it was again reissued in 1598 and 1680, the latter edition being edited by Binet, who added a considerable number of remedies.

Some editions, indeed, were mere compilations extracted from the book, and so errors of every description were repeated from one work to another for a considerable period. The early authors did not take the trouble to verify the statements made by the pioneers of botany, but apparently accepted them as inspired truths. Nevertheless, Dioscorides did a great work in compiling his historic "Materia Medica." He commanded a universal audience, he had a single aim, and his plan was as simple as a catalogue. His chief object was to bring before his fellow-physicians various substances of

the vegetable and animal kingdom which they might use as remedial agents, to which he added his own experiences thereon. Besides this enumeration of the substances used in materia medica, he gives a collection of synonyms from various languages with which he had become acquainted in his extensive travels in Italy, Spain, Gaul, Dacia and Africa.

It was from this enumeration that a vocabulary of plant names was formed, which became accessible to the civilized world, and to Dioscorides, therefore, we must attribute the foundation of a universal nomenclature. "With him," says Earle, "botany first became extra-national, surmounted local barriers, and furnished material for a world-wide science."

Another early work on botany is that of Apuleius Barbarus or Platonicus, entitled "De herbis sive de nominibus et virtutibus herbarum," a copy of which, in Latin, said to have been written in the tenth century, is in the Bibliothèque Nationale in Paris.

Of the author practically nothing is known, but he is supposed to have lived about the fourth century. The work is a compendium of plant knowledge of the period, without much claim to originality, being mainly compiled from the works of Dioscorides and Pliny. For centuries this was one of the most popular works on botany in Europe, and was translated into Anglo-Saxon.

One of the earliest English writers on botany, after the Conquest, was Henry, Archdeacon of Huntingdon, who lived during the time of Stephen and Henry II. He was the author of a codex entitled "De Herbes de Aromatibus et de Geminis," which is divided into eight books, a copy of which is in the Bodleian Library.

Henry Arvill is believed to have been the author of a work called " De Botanica sive Stirpium varia historia," which is supposed to have been written about the year 1280.

Following him came John Bray, a physician and botanist, who received a pension from Richard II for his knowledge and skill. He is the author of a work called " Synonyma de Nominibus herbarum," which is illustrated with drawings in outline and is apparently founded on the work of Dioscorides. He enumerates 221 plants, and gives their names in Greek, Latin, Egyptian and other languages, together with an account of their medicinal properties.

From the eleventh to the end of the fourteenth century there were many other manuscripts written on plants and herbs, the authors of which are unknown. Several of the earliest were translated into Anglo-Saxon, and of these, two, written about the twelfth century, are in the Bodleian Library and the library of Christ Church, Canterbury.

There are also two lists consisting of the names of plants and their medicinal properties called respectively, " Herbarium Saxonice," and " Tractatus qui ab Anglo-Saxonibus dicebatur liber medicinalis," in the Harleian Collection at the British Museum.

Henry Daniel, a Dominican friar of the fourteenth century, who was renowned for his knowledge in physic and philosophy, was the author of a work entitled " De re herbaria, de arboribus, fructibus," which treats of the use of herbs, trees and fruits, etc. The first part of this work is devoted to plants and the second to trees, fruits, stones, minerals, animals and other substances used in medicine.

Henry Calcoens, a prior of the Benedictine order, who also lived in the fourteenth century, was the author of a work called "Synopsis Herbaria," and there are two other botanical manuscripts of the same period extant, attributed to Nicholas Bollar of Oxford, entitled respectively "De Arborum Plantatione," and "De generatione Arborum et modo generandi et plantani." The British Museum possesses a manuscript on botany called "Manipulus Florum" by Thomas Hibernicus which contains 404 folios, but is without illustrations.

Another early work which enjoyed a large share of popularity during the Middle Ages is that known as "Macer's Herbal," which is written in Leonine verse. It is supposed to have been the work of Æmilius Macer, a Latin poet who lived about the year 24 B.C., but it seems more probable that it was written by Odo or Odobonus, a French physician of the ninth century. It was first translated into English by John Lelamar, Master of Hereford School, about the year 1373. A later translation was made by William Linacre, the famous physician to Henry VIII, which was published about 1530, under the title of "Macer's Herbal practysed by Dr. Lynacro, translated out of Latin into Englysshe."

These are but a few of the manuscripts and books from which the apothecaries of the Middle Ages culled their knowledge of the medicinal properties of the plants, herbs and other substances they used in the practice of their art.

CHAPTER XI

THE STORY OF THE PHARMACOPŒIAS

A PHARMACOPŒIA may be defined as a collection of formulæ for medicinal preparations issued under the authority of some publicly recognized body. It embodied a list of approved drugs and described the various methods of preparing them for administration or use, together with the proper weights and measures to be employed for accurate compounding. One of the chief objects of such an official publication was to ensure uniformity in the composition of the preparations and the purity of the substances used. It was in fact the apothecary's "Bible," to which he was enjoined to conform in preparing the medicines which might be prescribed by the physician.

The first of these books published by authority, which may therefore be called official, takes us back to the early days of printing, and was entitled "Nuovo Receptario Composto dal Famossismo Chollegio Degli Eximi Doctori della Arte et Medicina della Inclita Cipta di Firenze."

It was printed in Florence in 1498 and is a small folio volume measuring 29 × 22 cm. It has no pagination and consists of eighty-eight leaves.

Following the title is the preface, which states that "the learned doctors of medicine of the College of Florence, in order to prevent errors and to preserve

constancy in the preparations employed in their practice, sought to collect the most important formulæ from the works of Mesué, Nicholas, Avicenna, Galen and other authors."

A list is then given of the classified preparations and a table of contents, alphabetically arranged.

After recording the names of the approved herbs and drugs to be employed, certain preparations are described which may be taken as typical of those used by physicians of the period. They consist of 9 Confections, 17 Collyria, 7 Decoctions, 29 Plasters, 12 Locch (looch or lochs), 8 Honeys, 5 Oxymels, 10 Powders, 51 Pills, 11 Robs, 23 Syrups, 4 Species, 35 Ointments, 25 Siefi (preparations to be mixed with water and used for the eyes), 7 Treacles, 2 Juleps, 1 Infusion, 31 Lozenges, 2 Waters and 5 Suffusions (for fumigation).

Directions are given for the quantity of wax to be put into ointments to make them of proper consistency and also for the purification of honey.

It was not until 1535 that the next historic Pharmacopœia, called the "Dispensatorium," was compiled by Valerius Cordus, a young German physician, at the age of twenty-seven; and was published in Nuremberg under the sanction of the Senate of that city.

It consisted largely of formulæ taken from the Antidotarium of Nicholas and other early writers already mentioned, and was enjoined by the several authorities of Nuremberg, to be used under penalty by the apothecaries who dispensed medicines.

Cordus enumerates 246 herbs and plants and mentions opium, aloes, aconite, elaterium and scammony. Among the mineral substances, antimony, cream of tartar,

sulphur, mercury and arsenic are included. The preparations employed were cerates, confections, conserves, electuaries, infusions, lohochs, oils, oxymels, pills, powders, robs, syrups, lozenges, suppositories, treacles and ointments. Valerius Cordus is said to have discovered sulphuric ether, which he called Oleum Vitrioli Dulce, but it seems more probable that the product he obtained was that which was known later as the sweet oil of wine, and not that which we now call sulphuric ether.

The "Dispensatorium" of Cordus passed through many editions and was the forerunner of the national pharmacopœias which began to be published a few years later.

At this period, Germany was divided into a number of States and Principalities, many of which had various medical bodies of their own; thus as early as 1538, the physicians of Augsburg compiled a pharmacopœia which came to be generally adopted in that city. Augsburg had a considerable trade at that time with Italy, and it is probable that the regulations connected with the practice of medicine were introduced from that country.

The Augsburg Pharmacopœia, which is notable for the minute and paternal directions given to the apothecaries by the compiler and the State Council under whose authority it was published, was not, however, printed until 1601.

The duties of the apothecary are laid down by the City authorities and Medical College in detail, and he is directed not only how to keep his drugs but also how to carry on his practice. They state that "he should blush to do in secret what he would not do publicly, and he should do nothing in his profession negligently

or rashly, and not for fear of banishment but from love of virtue." His shop also should be in a healthy locality, remote from dust and smell. Without a prescription or permission from the magistracy he was not to sell love-potions or abortifacients. The authorities further prohibited "quacks of all kinds in the town, or others under the description of strollers, empirics, charlatans, Jews, fortune-tellers, sleight-of-hand men, old women and bombastic doctors."

The edition of the Augsburg Pharmacopœia printed in 1613 is notable for its beautiful title-page engraved by Lucas Kilian, on which are represented three female figures, one holding a drug vase, another stirring a confection in a pot, and a third holding a spatula and a case of instruments. The figure of Solomon stands on the right side and that of Mithridates on the left, while below is a panel with a view of the ancient city of Augsburg.

The preface was written by Raymond Mindererus, and is followed by a list of poisons and their antidotes, which appears to be the first of its kind included in a pharmacopœia. The list includes bryony, cantharides, the brain of a cat, hemlock, euphorbium, fungus, hellebore, sea-hare, mandragora, nux vomica, opium and scammony. Regulations are laid down for physicians, surgeons and apothecaries and the measures to be used for solids and liquids.

In 1512, Suardis, an apothecary of Bergamot, wrote a work called "Thesaurus Aromatiorum" which was printed at Milan, and was published together with the "Luminare Majus" of Manilius Bosco, both of which were used by the apothecaries. Another book, although

not official, entitled "Modus Faciendi," by Bernardino Laredo, one of the Franciscan lay-brothers at the Convent of Valverde near Seville, was printed in 1542 and had an influence on the art of the apothecary at that time. The preparations he mentions as then being in use were pills, powders, plasters, troches, syrups, decoctions, ointments, confections, dried conserves and collyres, which he describes as being a solid medicament about the form and size of a date or prune.

The next work of importance was the "Compendium Pharmacopœia" of Johannes Placatomi, printed in Lyons in 1561, which was followed by the Pharmacopœia of Cologne in 1565, the "Pharmacopœia in Compendium Redacta" by Bretschneider, printed in Antwerp in 1560, the Pharmacopœia of Foe, printed in Basle in 1561, and the "Pharmacorum Omnium" of Collado, printed in Valencia in 1561. A work greatly esteemed by the apothecaries was the "Pharmacorum Omnium" of Fuch, printed in Paris in 1569, while the "Pharmacopœia Bergamensis" of Maselli, printed in 1580, Nuck's "Pharmacopœia," published in Amsterdam in the same year, and Bauderon's "Paraphrase sur la Pharmacopée," printed in Lyons in 1588, also had a wide circulation.

The "Formulæ Remediorum," a collection of formulæ made by Petrus Gorræus and printed in 1562, shows a great advance on the earlier works of the kind and several new methods of administering drugs are mentioned. He includes twenty-one different modes of preparing drugs, including juleps, potions, boluses, pills, apozems, emulsions, powders, electuaries, conserves, lohochs or eclegma, suppositories, nodules, pessaries,

clysters, syrups, baths, plasters, ointments, liniments, suffusions and collyria.

During the latter half of the sixteenth century many new drugs which have since proved of great value, were introduced from America and overseas. Among them may be mentioned balsam of tolu, which was brought to Europe by Monardes, a Spanish physician, in 1574, sassafras in 1562, jalap and copaiba by the Portuguese in 1570, and ipecacuanha, which was introduced into Europe about the same time.

In the early part of the seventeenth century, the medical Colleges and other bodies dealing with the practice of medicine in Western Europe began to realize, that the ancient formulæ that had been in use for centuries, which often consisted of inert substances, were sometimes quite useless and frequently incompatible. The perpetual fear of poisons during the Middle Ages, and the search for antidotes against them, had brought together and perpetuated a mass of formulæ, many of which were without any real value.

This led to the revision of many of these recipes and the conservation of those which were thought to have proved useful from experience.

The leading medical faculties in various countries, after much deliberation, then began the issue of official pharmacopœias as guides to the physicians and apothecaries in the preparation of medicines, and between the years 1600 and 1700 over twenty-five of these books were published.

In England, the publication of a pharmacopœia came under the consideration of the College of Physicians of London as early as 1585, but nothing definite was

accomplished. Committees were appointed and the matter was again brought forward in 1617, soon after King James I had granted the apothecaries their separate charter of incorporation. This time it bore fruit, for in May 1618, mainly through the influence of Sir Theodore Mayerne, the King's physician, who wrote a dedication of the work to his Royal master, the first London Pharmacopœia appeared.

The book was published by the printer on May 7th, 1618, " surreptitiously and prematurely " according to an official account, and before it had been properly corrected and approved. The printer, E. Griffin at the sign of the " White Lily," was therefore admonished, and the publication being taken out of his hands, it was reissued on December 7th of the same year with the errors corrected, by John Marriott at his shop in Fleet Street.

It contained His Majesty's Proclamation dated April 26th, 1618, requiring " all the apothecaries in the realm to obey this Pharmacopœia and this only."

The second issue is noteworthy for its fine title-page from a plate engraved by R. Elstra. It consists of a panel of architectural design supported by pillars, on the top of which rests the Royal Arms. On the right and left of a tablet bearing the title, are full-length figures of Hippocrates and Galen, and below are representations of Mesué and Avicenna with their hands resting on the mantling of the arms of the College of Physicians.

This work, a quarto volume of 204 pages, shows a great advance on previous pharmacopœias and was reprinted in 1627, 1632 and 1639.

It enumerates 1,028 simples and 932 preparations and

TITLE-PAGE OF THE LONDON PHARMACOPŒIA

Third issue of first edition, 1632

compounds. It includes cerates, confections, conserves, decoctions, electuaries, plasters, extracts, juleps, liniments, lohochs, honeys, oils, pills, powders, robs, siefs, juices, syrups, lozenges, wines, ointments, and medicated waters.

To some of the formulæ the names of the originators are appended, and many curious substances enter into their composition. Thus we find precious stones, oil of ants, worms, swallows, vipers, foxes' lungs, crabs' eyes and woodlice included among the materia medica.

In the second edition, printed in 1650, several new formulæ and preparations are added and others deleted, although human skull, and the moss which grew on it, were still retained among the remedies.

The third edition of 1677 is notable for the introduction of usquebaugh or aqua vitæ, now commonly known as Irish whisky, and Peruvian bark (cinchona), which a few years previously had become known in this country as a remedy for ague.

In 1721, a fourth edition was published, supervised by Sir Hans Sloane, which was a distinct improvement on its predecessors and for the first time the botanical names of the plants were included.

In the fifth edition, the College express their desire to eliminate the "antidotes superstitiously and doatingly derived from oracles, dreams and astrological fancies" from the book; but, in spite of this laudable wish, human fat, mummy and the bone of a stag's heart still remained in the official book of medicines.

It was not until the sixth edition, in 1788, that Mithridatium, Theriaca, Bezoar stones and other relics of the Middle Ages were deleted. Between 1618 and 1851

over twenty-seven editions and reprints of the London Pharmacopœia were issued.

The next national pharmacopœia of importance was that of Amsterdam, published in 1636, and which passed through five editions before 1800.

In France, as in this country, the publication of an official work was delayed, and it was not until 1639 that the first Parisian Codex or Pharmacopœia of France was published, in compliance with a new order from Louis XIII. As early as 1590, the French Parliament had decreed, with a view to the public good, that "the Faculty of Medicine should select a committee of their body for the purpose of preparing a dispensary which the apothecaries of Paris ought to keep in their shops." The decree, however, remained unexecuted until 1597, when Parliament again named twelve members of the Faculty who were enjoined to prepare such a dispensary and, after further injunctions, the Codex was produced after a period of forty-two years.

In Spain, the first pharmacopœia was printed in Valencia in 1651; in Antwerp another was published in 1661, and this was followed by the Pharmacopœia of Brussels in 1671, which also has an interesting title-page from a plate engraved by Troyen.

The upper part represents an apothecary's shop, on either side of which are figures of Hippocrates and Galen, while in the centre is Apollo; Andromachus, holding in his hand a vase labelled "Theriaca," is on the left, and a figure of Dioscorides on the right.

In a panel at the base is a view of Brussels, at that time a walled city, in which the cathedral of St. Gudule stands prominent.

An innovation in this work is an appendix containing a price-list of some drugs and preparations. In it, Essence of Amber and Oil of Cinnamon are quoted at 3 florins a drachm, Magistery of Pearls at 6 florins a drachm, Oil of Scorpions at 4 florins an ounce, and Wolfs' Liver and Foxes' Lungs at 1·4 florins an ounce. Among the drugs Kinkinna, also known as Febrium Lignum (cinchona), is described as "a new tree from Peru," and the formulæ include one for Orvietan (an electuary of great repute in Italy as an antidote to all poisons), which mainly consisted of the Treacle of Andromachus, Mithridatum Lozenges, together with several aromatic gums and roots.

In Switzerland, the "Pharmacopœia Regia, Galenica et Chimica," was published in 1684, the "Pharmacopœia Helvetia" in 1771 and that of Geneva in 1780. In Sweden, the "Pharmacopœia Holmiensis" was published in Stockholm in 1686, but the first national work was not issued until 1775. In the fifth edition of this book, printed in 1817, the section dealing with vegetable drugs was prepared by the famous botanist Swartz, and Berzelius, the celebrated chemist, was responsible for that describing the chemicals.

The "Pharmacopœia Catalana" was printed in 1686, but the Pharmacopœia of Madrid, which came into general use in Spain, was not published until 1729. In the second edition of this work, printed in 1739, a class of preparations called "laudanums" is included, among which are Laudanum Cinnabarinum, Liquidum, Simplex and Opiatum. The Laudanum Liquidum contained opium, saffron, cinnamon and cloves, digested in white wine, and is probably taken from the formula originated

by Sydenham. Laudanum Simplex was made by extracting opium with hot water to form an aqueous tincture, while the Laudanum Opiatum or Nepenthe contained extract of opium, saffron, pearls, hyacinth, coral, terra sigillata, Bezoar stone and the horns of the unicorn and hart in powder. Recipes are also given for tooth-powders or medicated dentifrices, one of which contains powdered pumice-stone, cuttle-fish, cream of tartar, dragon's blood, red coral and orris root, and an Anti-Scorbutic Dentifrice consisting of powdered pyrethrum, Winter's bark, mace, burnt alum and catechu.

The " Pharmacopœia Lillensis," printed in 1694, which has an engraved title-page representing Apollo and Æsculapius, together with the figure of Poseidon and an apothecary's shop, is interesting on account of the directions given for the recognition, collection and storage of the official herbs and an explanation of words used in chemistry.

The first Edinburgh Pharmacopœia was published in 1699, and was compiled by the Royal College of Physicians of that city. This body had by charter the right of inspecting the apothecaries' shops in Edinburgh and Leith, and of destroying such drugs as were not of good quality. By virtue of this, it appears that the College was able to impose its Pharmacopœia on the apothecaries in the surrounding districts, and it soon became authoritative throughout Scotland. It included about 900 drugs and preparations, among which were a formula for Pulvis Contra Vermes consisting of santonica and rhubarb, and an Aqua Styptica containing alum. The first Dublin Pharmacopœia was published in 1807,

although in 1794 a "Specimen Pharmacopœia" had been circulated among the members of the College and it was last issued in 1850.

The early part of the eighteenth century saw the advent of many new editions of the national pharmacopœias, all of which show a distinct advance on their predecessors. Chemical substances increased in number with the advancing knowledge of that science, drugs of animal origin began to disappear, and so gradually the electuaries, confections and other preparations of a past age were replaced by the more simple infusions or decoctions of herbs, extracts and tinctures; while medicated waters and syrups were greatly augmented.

In 1711, the "Pharmacopœia Lusitana" was published in Portugal, which was followed, in 1718, by the "Pharmacopœia of Leyden," printed partly in Dutch and partly in Latin. The latter has a finely engraved title-page on which Æsculapius is represented standing in the foreground with a spacious apothecary's shop at his back. In Holland, also, the "Pharmacopœia of The Hague" was published in 1738, and another in Liége in 1741 which became official in Flanders.

In 1608, a pharmacopœia entitled "Dispensatorium Brandenburgicum s. norma juxta quam in provinciis Marchionatus Brandenburgici medicamenta officinis familiaria dispensanda, etc." was published in Germany, which was followed by the "Dispensatorium regium et electorale Borusso-Brandenburgicum" in 1713. On the last edition of this work in 1781 the "Pharmacopœia Borussica" was founded.

The first official Russian Pharmacopœia was published in 1836, although there had been previous works of the

kind printed without authority, and a separate pharmacopœia for Finland was published at Aboe in 1819, and one for Denmark in 1772.

A pharmacopœia for Greece, approved by the College of Medicine, was published in 1837 and an official work for Poland was printed at Warsaw in 1817.

A pharmacopœia for the United States of America was first published in 1820, under the authority of the National Medical Convention, and was entitled, " The Pharmacopœia of the United States of America, by authority of the Medical Societies and Colleges," Boston, 1820. A revised edition appeared in 1830 and regulations were then made for publishing a new edition every ten years.

In Great Britain, the Medical Act of 1858 authorized the fusion of the pharmacopœias of the three kingdoms, which hitherto had been published independently, and the work was assigned to the General Medical Council. This resulted in the publication of the " British Pharmacopœia " in 1864, which has since passed through many editions and is the standard and official formulary of medicine in this country and throughout the Empire.

Besides these official works published under the authority and sanction of the laws of their respective countries, there were many books on medicine, usually called " Dispensatories," of value to the apothecary which had considerable circulation.

They resembled the pharmacopœias in their general objects, but were the work of individual authors, and consisted of collections of formulæ and commentaries on the properties of drugs.

Of these, mention should be made of Quercetan's Pharmacopœia, first published in 1603, and the "Dispensatorium Medicum" of Renodoeus, one of the best works of the time, which deals with pharmaceutical operations, materia medica, preparations and compounds, each of the latter being followed by a commentary.

Mindererus published a work on "Military Medicine" in 1621, and the "Pharmacopœia Spagirica," written by Poterius, appeared about the same time. Schroeder's "Pharmacopœia Medico-Chymica," printed at Ulm in 1641, was a work of some merit which became popular throughout Europe. The edition of 1672 printed at Leyden contains the materia medica in Latin, French, English and Dutch.

Glauber's works, which added much to the knowledge of chemistry at the time, were also in demand, especially his "Novum Lumen Chimicum and Pharmacopœia Spagirica," published between 1646 and 1668, the year in which he died.

About this time Nicholas Culpeper, who acquired notoriety by his criticisms of the College of Physicians and their first pharmacopœia, published several works on medicine, and translated the London Pharmacopœia into English in 1653, which brought him into trouble with the authorities.

In 1676, Charas published his "Pharmacopœia Royale, Galenique et Chimique," which had a considerable circulation in France and which was translated into English in 1678. Contemporary with him was Pomet, chief pharmacist to Louis XIV, whose "Histoire des Drogues," printed in 1694, was likewise translated

into English, and Lemery, also, whose "Pharmacopée Universelle" was published in 1697.

In 1688, James Shipton, an apothecary of London, published a collection of formulæ said to have been prescribed by Dr. George Bate, a well-known physician in the time of Charles II, which was known as the "Pharmacopœia Bateana." It was much used by the apothecaries, and editions were published by Fuller in 1691 and by Salmon in 1694, both of which remained as works of reference down to the end of the eighteenth century. Fuller also published a pharmacopœia entitled "Pharmacopœia Extemporanea" in 1714, and Quincy's "Pharmacopœia Officinalis et Extemporanea, or Complete English Dispensatory," which first appeared in 1718, passed through six editions and was translated into French in 1745.

Another useful work, James's "Pharmacopœia Universalis," which embodied formulæ from the chief continental works on drugs, was first published in 1747, and later, in 1754, came Brooke's "General Dispensatory" and Lewis' "New Dispensatory," containing commentaries on the London and Edinburgh Pharmacopœias.

CHAPTER XII

THE VALUE OF DRUGS IN THE FOURTEENTH AND FIFTEENTH CENTURIES—SYMBOLS FOR APOTHECARIES' WEIGHTS AND THEIR ORIGIN

AN interesting comparison may be made between the value and prices obtained for certain drugs in early times and those of a later period.

Our knowledge of drug values is derived from certain manuscripts containing lists and inventories that still exist among State papers and other official records.

The earliest of these at present known is a list of medicines recorded by the King's physician, one Nicholas de Tyngewyke, in 1307. King Edward I was taken ill at Carlisle, and the cost of conveying the drugs and preparations required, from London to the north, amounted to £159 11*s.* 10*d.*, while his apothecary's bill for the medicines was £134 16*s.* 4*d.*

In a calendar of documents relating to Scotland in the time of Edward II is an account for drugs supplied to the King's surgeon in August 1322, which gives us an idea of the medicines employed in the Army at that period. It is headed:

"Medicinalia provided by Master Stephen of Paris, the King's Surgeon, in the 16th year, for the Scottish war.

"Sum total, including carriage from London £9 3*s.* 9*d.*"

The "drogeries, implastra, etc.," mentioned in the account include the following:

"3 lb. Oxerocrosin at 2*s*. per lb." This was a plaster employed for wounds, containing saffron and vinegar.

"3 lb. Dyatarascos at 2*s*. per lb." An electuary containing gentian, germander and aristolochia.

"6 lb. Apostolicon at 2*s*. per lb. 12 lb. Dyacaulon at 4*d*. per lb. 12 lb. Terbentyn at 7*d*. per lb. 6 lb. Agrippa at 8*d*. per lb. 12 lb. White Ointment at 8*d*. per lb. 12 lb. Dark (fuscum) Ointment at 12*d*. per lb. 4 lb. Gracia Dei at 2*s*. per lb." (This was a plaster composed of resin, yellow wax and turpentine.) "1 lb. Apoponak at 3*s*. per lb. 2 lb. Mastyk at 2*s*. per lb. 2 lb. Sanguis Draconis at 2*s*. 6*d*. per lb. 1 lb. Mirre at 3*s*. per lb. 4 lb. Calamine at 4*d*. per lb. 2 lb. Tutie at 16*d*. per lb. 4 lb. Litargie at 4*d*. per lb. 3 great 'paniers,' 6*d*.

"Carriage from London to Edinburgh and from thence to Halyeland 38*s*."

They were transported from London to Newcastle by land and thence to Edinburgh "in Scocia" by water, and "back from thence to Halyeland and delivered to the King's camera there at the sight of Sir Thomas de Usflete, the King's private clerk, by the King's precept."

Another list of drugs and prices is recorded in a manuscript in the British Museum dated "in the year of Edward II, 1328, and inscribed by Ambrosis de Spencers." It includes the following:

"Sal Potii lb. XII*s*. Sal Armon. lb. VI*s*. Sal Nytre lb. II*s*. Sal Alamb. lb. II*s*. Amonaci lb. XX*s*. Alos lb. XL*s*. Alos Lign. lb. XII*d*. Bdellum lb. VIII*s*.

Galbanum lb. VI*s*. Opoponak lb. VI*s*. Gum Olibanum lb. XII*d*. Bol Armen lb. VIII*d*. Vitrioli lb. II*s*. Storax lb. XX*d*. Asafodida lb. VII*s*. Euforbin lb. V*s*."

In a list of preparations made by a Silesian apothecary in the latter part of the fourteenth century, the following are quoted :

Rosi Syr. Simp, Syr.	i lb.	1½ marks.
Aurea Alexandrina Theriaca	I oz.	2 marks.
Ol. Rosati	1lb.	2 marks.
Pil. Aromat.	No. 15	1 groschen.
Ol. Benedicti	1 lb.	10 marks.

A list dated 1460 contains the following items :

" Sal Pott lb. XII*d*. Sal Ammon. lb. VI*s*. Alos lb. XL*d*. Alum lb. VIII*d*. Bdellum lb. VIII*s*. Galbanum lb. VI*s*. Opoponax lb. VI*s*. Mastich lb. XVI*d*. Olibanum lb. XII*d*. Bol. Armon. lb. VIII*d*. Euphorbii lb. V*s*. Cascarilla lb. II*s*. Storax lb. XX*d*. Asafodida lb. VIII*s*. Sagypyn. lb. VI*s*."

In another list, dating from about 1545, the following drugs and prices are recorded :

" Asafetida ½ oz. = 4*d*. Aloes ½ oz. = 8*d*. Galbanum I oz. = 4*d*. Lapis Calam. I lb. = 3*d*. Mastich I oz. = 4*d*. Arabian Gum ½ oz. = 4*d*. Camfer ½ lb. = 3*sh*. Labdam, ½ lb. = 4*d*. Olibanum I oz. = 3*d*. Argent Viv. 6 oz. = 6*d*. Sem. Coriand I lb. = 16*d*."

Taking into consideration the difference in the value of money at these periods, the difficulty and cost of

transport in those days, especially in the drugs imported from Arabia and the East, the prices recorded appear to be very moderate.

It is interesting to compare the foregoing prices with those quoted in a list of drugs of the seventeenth century.

It is headed "Rates and prices currant of drugs and other commodities belonging to physick, as they are commonly sold at the Apothecaries and Druggists in London, 1685."

Mother of Pearl 6*d.* per oz. Crab's Eyes 5*s.* 4*d.* per lb. Crab's Claws 1*s.* 6*d.* per lb. Fox's lungs 2*s.* lb. Mummy 5*s.* 4*d.* lb. Bone of Stag's heart 1*s.* 6*d.* lb. Borax 4*s.* lb. Saltpetre 10*d.* lb. Jalap 3*s.* 4*d.* lb. Rhubarb 14*s.* lb. A Boar's tooth 1*s.* each. A dead man's skull (according to size) 8*s.* to 11*s.* each. Musk 5*s.* a drachm. Bloodstone 2*s.* 6*d.* lb. Opium 12*s.* lb. Elaterium 36*s.* an ounce. Lac Sulphur 3*s.* an ounce. Red Coral 4*s.* a lb. Oleum Copaibae 2*s.* an ounce. Gum Acacia 10*s.* lb. Turmerick 8*d.* a lb. Elicampane 1*s.* 4*d.* a lb. Galingal 4*s.* a lb. Gentian 8*d.* a lb. Spanish Liquorice 6*d.* a lb. Hellebore, white, 1*s.* a lb. Hellebore, black, 1*s.* a lb. Pyrethrum 1*s.* a lb. Sarsaparil, according to its goodness, from 4*s.* to 5*s.* a lb. Squills 6*d.* a lb. Winter's bark 2*s.* a lb. Lig. Aloes 9*d.* an oz. Lig. Guaici 2*d.* a lb. Senna Alex. best 4*s.* a lb. Cubebs 2*s.* 4*d.* a lb. Nucis Vomicæ 1*s.* 4*d.* a lb. Cardamom 4*s.* a lb. Aloes Soccot. according to its goodness, 4*s.* to 6*s.* a lb. Scammony 12*s.* a lb. Cantharides 4*s.* a lb. Civet 5*s.* 6*d.* a drachm. Ising-glass 5*s.* 4*d.* a lb. Sea-horse tooth 4*d.* an oz. Sea-horse pizzle 4*d.* an oz. Skinck, a piece 1*s.* 4*d.* Spermaceti 3*s.* an oz. Stag's pizzle 6*d.* an oz. Elk's claw 2*s.* a piece. White wax 2*s.* lb. Yellow wax 1*s.* 4*d.* a lb. Cinnabar 3*s.* an oz. Mercury sublimate 5*s.* 8*d.* or 6*s.*

per lb. Seed pearls 4*s*. to 8*s*. per lb. Mithridate 6*s*.
per lb. Aqua Fortis 5*s*. 4*d*. a lb. Ol. Cinnamon 32*s*.
per oz. Ol. Vitrioli 5*s*. 4*d*. per lb.

The origin of the symbols used for the scruple, drachm and ounce of the apothecaries' weight, which are still employed by physicians when writing prescriptions, have often been discussed and various theories have been advanced as to their source.

Evidence of their antiquity is given in a manuscript written in the twelfth century entitled, "De Mensuris Medicinalibus," in which an account is recorded of the weights and measures employed at that period.

The writer states that "symbols were first employed by the Chaldeans and Babylonians, but that the Alexandrians were the first to use the scruple, and the Greeks and Romans the obolus and dragma."

A list is given of the weights and their corresponding symbols employed in the twelfth century, which is interesting as being the earliest of its kind known. Several of the symbols closely resemble some of those employed at the present time, as, for example, the symbol for the scruple. The symbol representing the drachm used to-day is similar to the one shown in the manuscript for sercans. This record shows that these symbols were employed as early as the twelfth century.

In a later manuscript written about the close of the fourteenth century there is another list of weights and their symbols, from which it will be seen that the symbols for the scruple, the drachm and the ounce are the same as those used to-day, also that the same contraction is still employed for the pound.

A further light is thrown on the origin of the symbols in a manuscript of the fifteenth century now in the British Museum. In this work the symbols for the scruple, drachm and ounce are exactly the same as those

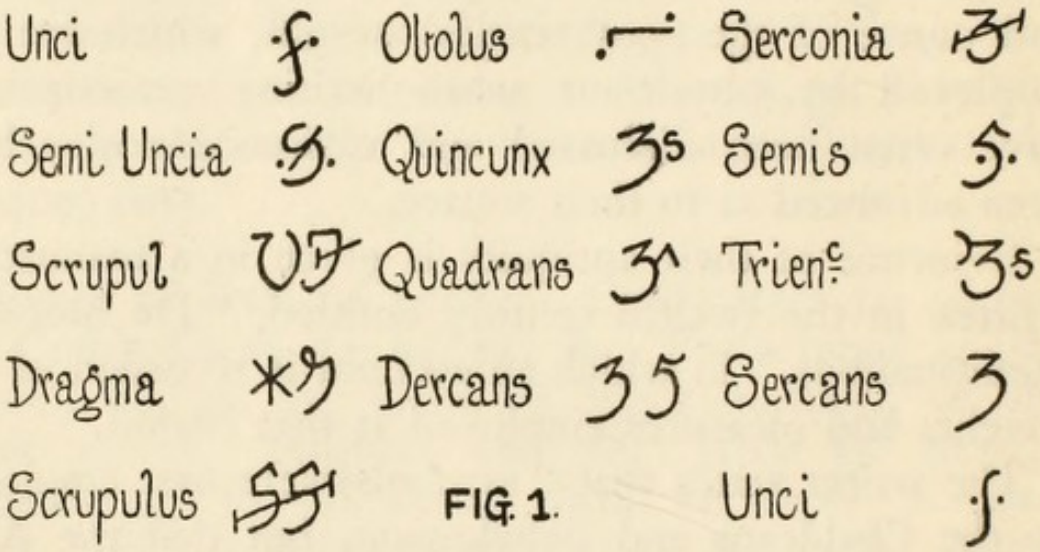


FIG. 1.

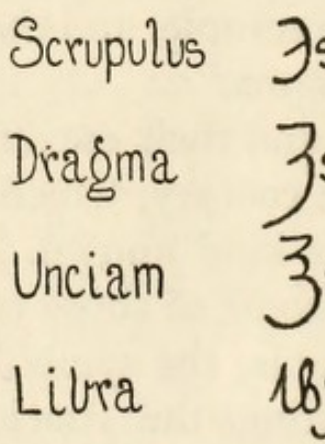


FIG. 2.

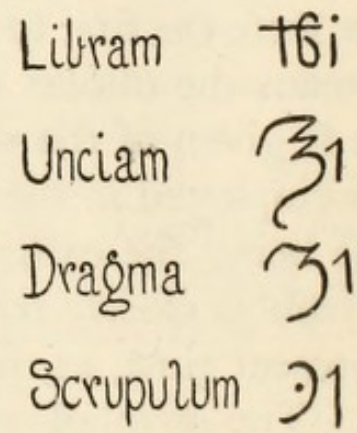


FIG. 3.

FIG. 1.—SYMBOLS FOR WEIGHTS USED FOR DRUGS IN THE XII CENTURY
FIG. 2.—SYMBOLS FOR WEIGHTS USED FOR DRUGS IN THE XIV CENTURY
FIG. 3.—SYMBOLS FOR WEIGHTS USED FOR DRUGS IN THE XVI CENTURY

used by physicians when writing prescriptions at the present time.

It is asserted by some writers that these symbols were originated by the Arabs, but an examination of early Arab manuscripts on medicine, many of which are

extant to-day, fail to reveal any confirmation of this statement. The weights and measures mentioned by Rhazes and other Arab writers are generally those which were employed by the Greeks and Romans.

Our system is said to have been derived from the same source. The Romans applied the term uncia to the twelfth part of various magnitudes of weight, volume, length, money and time. Our inch is the "uncia or twelfth part of a foot." The grain weight did not apparently come into use until the thirteenth century, as before that period, directions for taking small quantities of drugs are generally given as "a piece the size of a corn," or "a pinch," should the substance be in powder.

In Collier's translation of the works of Celsus, printed in 1831, he gives a table of weights and measures with their symbols, which it is believed he culled from various codices from the Roman period, although no references are given. In this table several symbols are employed for the same weight, and the symbol at present used for the drachm occurs for several different dimensions.

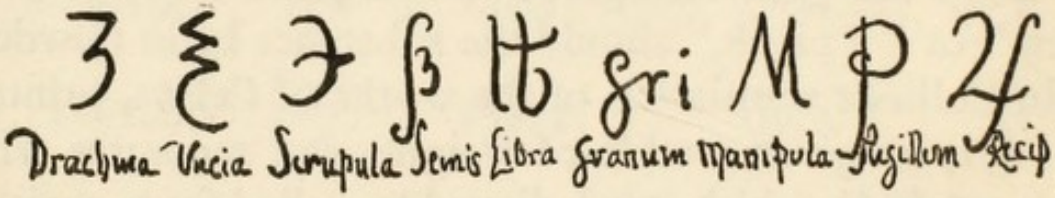
In 1790, Paucton published a series of symbols representing Greek and Roman weights and measures, but the present symbol for the scruple does not occur among them.

Bartholomew Glanville, in "De Proprietatibus Rerum," written in 1360, gives his view of the origin of the symbols for the drachm and the scruple. He states, "the Scrupulus weigheth six huoles and is called dragma in Greek, and this name Scrupus is a diminutive of Scrupulus = a little stone. Now Scrupulus is called Denarius, and is accounted for 10*d.* and the original symbol was X.

" The dragma is the eighth part of uncia and weigheth 3 pence of silver. The symbol for the scruple is the Greek ϑ and the sign for the dragma is 3 pence of silver = 3."

Glanville's explanation is certainly ingenious, and points to the symbols being of Greek origin.

The symbol for the drachm 3 has been employed, with slight variations, throughout Europe from about the fourteenth century. Examples are to be found in the MS. " Constantine Brevarius " of the fourteenth century in the University library, Cambridge, and in



SYMBOLS USED FOR APOTHECARIES' WEIGHTS IN 1587

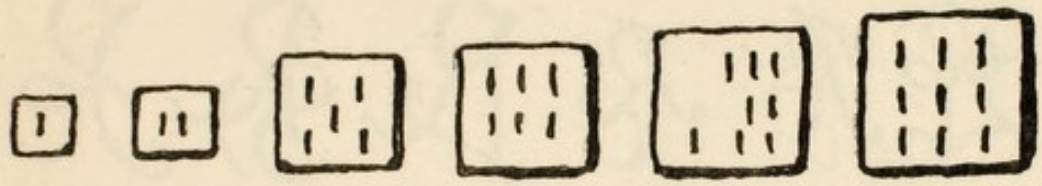
the MS. of William of Saliceto of the fifteenth century in the Bodleian Library, Oxford. It was also a symbol frequently employed by alchemists at the same period and was used to denote cinnabar, iron and also an alembic.

The symbol still in use for the ounce, which is the same as the drachm with the addition of another line, thus ℥, is to be found in manuscripts from the fifteenth century and is thought probably to have been derived from a Greek source. There are similar signs to be found in some of the Egyptian medical papyri, but they have no apparent connection with weights.

There is an interesting set of Roman weights in the British Museum which are said to have been used by an apothecary. They were discovered at Lyons and con-

sist of six flat small square pieces of metal. They range from one to nine scruples and are marked thus ı, which is repeated by nine similar signs. The unit is the scruple ($\frac{1}{24}$th part of the ounce), which weighs about $17\frac{1}{2}$ grains, corresponding to the present scruple of 20 grains.

Rice believed the scruple symbol to be a modified form of the Greek gamma and associates the drachm symbol with that of the Greek X, while Wall suggests that the Greeks adopted the latter symbol to represent the half of the Egyptian medicinal weight unit, which is said to have been equivalent to a double drachm.



SET OF ROMAN APOTHECARIES' WEIGHTS FOUND AT LYONS

Judging from the evidence before us and the various opinions advanced, it seems most probable that the symbols are of Greek origin.

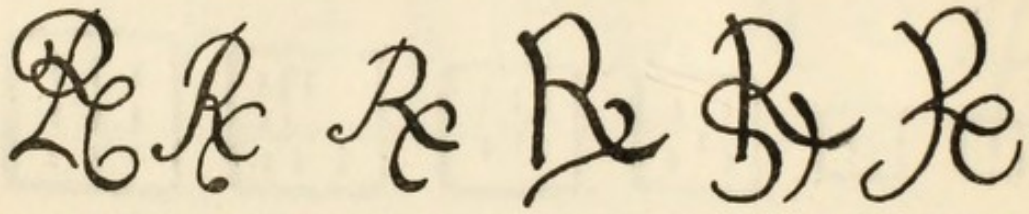
Another interesting symbol, the origin of which is obscure and has long been a subject of controversy, is that still employed by physicians to head their prescriptions.

Since Roman times, a symbol variously written ℞ or ℔ has been used to prefix the formula in a prescription. It is believed by some to be an abbreviation of the Latin word "Recipe," and by others to represent the astronomical sign of the planet Jupiter.

The first suggestion of the latter origin of the symbol appears to have come from Dr. Paris, who in his "Phar-

macologia" (1820) states, "such was the supposed importance of planetary influence, that it was usual to prefix a symbol of the planet under whose reign the ingredients were to be collected; and it is not perhaps generally known that the character which we at this day place at the head of our prescriptions, and which is understood and supposed to mean 'Recipe,' is a relic of the astrological symbol of Jupiter."

There is, however, no evidence to support this suggestion, and as each plant or drug according to astrological beliefs, would be influenced by a different planet, it is impossible to conceive that Jupiter alone



VARIOUS STYLES OF WRITING THE CONTRACTION FOR "RECIPE" FROM PRESCRIPTIONS IN THE XV AND XVI CENTURIES

would be chosen. It is true that the Jupiter symbol is sometimes used to head formulæ both in manuscripts of the fifteenth century and in printed books of the sixteenth century, but as regards the latter it is probable that the printer may have used the sign as the nearest approach he had in type to the abbreviated sign for recipe. The symbol for the planet Jupiter was used for other purposes besides that of astronomical significance and was also employed as the alchemical symbol for tin. Flammarion believed that the sign for Jupiter was the barred letter Z or an abbreviation of the word Zeus. In botany it was used as an abbreviation to indicate that a plant is intermediate between annuals and perennials in duration of life.

Gilbert states his belief that the confusion between the two symbols is due to a mere typographical coincidence; ℞ represents both the barred lower-case letter r, short for recipe, and the barred letter Z short for the planet Jupiter originally, and, by extension, also short for its use in other ways.

A careful examination of the various styles of writing the symbol, taken from manuscripts from the fifteenth to the seventeenth century, clearly shows that the sign was originally adopted as an abbreviation of the word "Recipe."

CHAPTER XIII

THE APOTHECARY AND HIS SHOP IN THE SIXTEENTH CENTURY

IT was not until the time of the Tudors that the status of the apothecary became more clearly defined.

William Bullein, physician, botanist and rector of Blaxall, Suffolk, in his book called the " Government of Health " printed in 1558, has left us an admirable picture of the apothecary of his time, and refers to his duties and functions, also the place in which he carried on his art. He aptly reminds him that his office is to be the " physician's cooke."

He observes:

" He must fyrst serve God, forsee the end, be clenly, pity the poor. Must not be suborned for money to hurt mankynde.

" His place of dwelling and shop to be clenly, to please the sences withal.

" His garden must be at hand with plenty of herbs, seeds and roots.

" To sow and gather, preserve and kepe them in due tyme.

" To read Dioscorides, to know the nature of plants and herbes.

" To invent medicines, to choose colours, taste, odour, figure, etc.

" To have his morters, stilles, pottes, filters, glasses, boxes, cleane and sweete.

" To have charcoles at hand to make decoctions, syrupes, etc.

" To keep his cleane ware closse and cast away the baggage.

" To have two places in his shop; one must be cleane for the physik and a baser place for the chirurgie stuff.

" That he neither increase nor diminish the Phisician's bill and kepe it for his discharge.

" That he neither buy nor sell rotten drugges.

" That he peruse often his wares that they corrupt not.

" That he put not 'quid pro quo' without advysement.

" That he may open well a vein for to help pleuresy.

" That he meddle only with his vocation.

" That he delyte to reede Nicholas Myrepsus, Valerius Cordus, Johannes Placaton, the Lubik, etc.

" That he do remember that his office is only to be ye physician's cooke.

" That he use true measure and weight,

" And lastly,

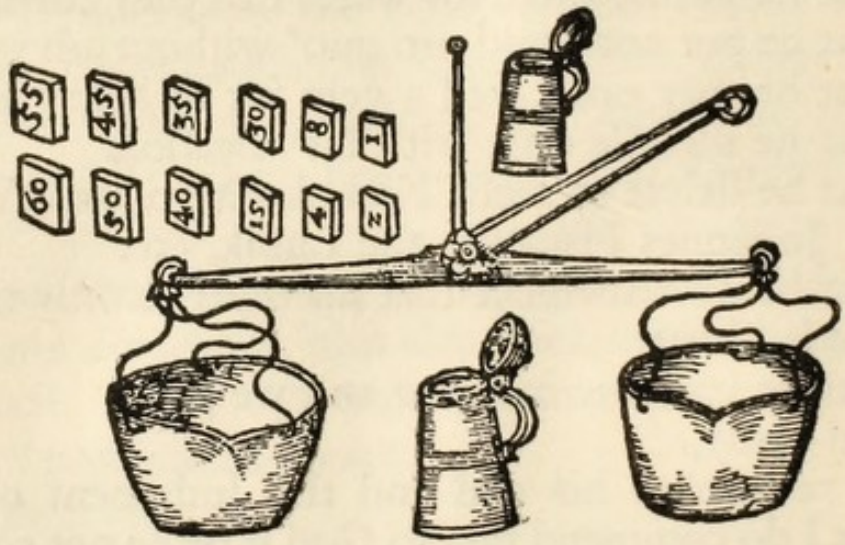
" To remember his end and the Judgment of God, and thus I do commend him to God if he be not covetous or crafty, seeking his own lucre before other men's help, succour and comfort."

The apothecary who carried out these excellent aphorisms would no doubt become a credit to his calling, as beyond the physicians, the barber-surgeons and the apothecaries, there were none who had any real training in the art of healing in the early part of the sixteenth century.

The physicians sometimes kept an open shop and like the apothecary sold plasters and pills over the counter to their patients.

Some idea of the apothecary's shop and what it contained in Tudor times may be gleaned from a contemporary record that has come down to us concerning the shop of one Thomas Brydon who lived in Cambridge in 1589.

The interior is described as containing "the great counters and two settles," and on the shelves lining the walls "stood 32 gallipots, 25 great boxes, 36 glasses, 7 oyle potts, two nests of boxes containing seeds, 8 rounde standing boxes and 34 other boxes." On a rack against



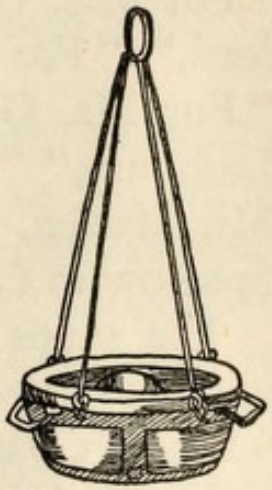
APOTHECARIES' SCALES, WEIGHTS AND MEASURES
(From a woodcut of the XVI century.)

the wall there were 4 pestles weighing 20 pounds, and standing on their blocks, "4 brazen mortars weighing ninescore and ten pounds, a marble mortar, a marble grynding stone and a muller." On the back counter stood 7 pairs of scales, and close by, 3 half-hundred weights of lead and 19 lbs. of brazen weights. Other furnishings were, "one bolsteringe, one hanging candlestick, 7 great standing pots," and probably in the back shop, "2 styllatories of lead and another styllatory of lead."

Judging from the inventory, conserves, confections and spices formed the greater part of his stock, which consisted of " 9 lbs. of conserves of barberries, conserve of cherries and roses, together with angelica, carraways, cummin seed, pepper, cloves, cinnamon and other spices; prunes and raisons."

Among the drugs mentioned are " stavesacre seeds, wormwood, calamine powder, red and yellow wax, spermaceti, oil of roses and diachylon plaster."

He also kept Emplastrum Gratia Dei, or the Plaster of the Grace of God, a preparation much in demand at the time for pains in the limbs. This plaster was composed of the juices of betony, verbena and pimpernel leaves mixed with frankincense, wax and sheep's suet, and received its curious name from the legend that " an angel brought it down from heaven to King Alexander for the people of his land, when they were all near lost with deadly woundes of spear, dart, and dagger, and with many other maladyes as the surgeons have long since fayned."



AN APPLIANCE FOR MIXING OINTMENTS (XVII century.)

The apothecary's great book with vellum covers, in which he copied the prescriptions or bills of the physician, stood on a raised desk or table. One of these books that belonged to an apothecary who practised in the city of London between 1588 and 1590 is still preserved in the Ashmolean Collection.

Each prescription is headed with the name of the patient for whom it was written; and, at the side, the name of the prescriber is also recorded.

Among the entries in 1588 is the following:

"My Ladye Ramsey

℞

	Aquæ Celestis Mathioli		℥iii
per	Syr. Cortibus Cervi		℥i
Dr. Volpe	Aq. Buglosi et		
	Aq. Aurantii	aa	℥iss
	Misce fiat potio."		

Others are inscribed, "For one in the Old Baylie," "For Mrs. Cole in Bred Stret," "For my Ladye Stafford," "For a merchant in Bred Stret, Mr. Curtis," "For Mr. Gorge at West^{mstr}," "For Mr. Webb ibn Lothbury," "For Mr. Stokes in Turnbull Stret," "For Mr. Marten, My Lord Mayor's man," and "For Mrs. Sparrow in Cheapside."

The shops at this period are described as having a window-frame over which canvas was stretched, but when this was rolled up they were open to the street.

In another description of an apothecary's shop in 1587, it is stated on the counter stood several pairs of scales and a pestle and mortar, while in front was a settle, presumably for the patients or customers who might be waiting to sit. Among other items recorded in this shop are "two crystal stones," no doubt for the purpose of foretelling or "skrying," as many apothecaries at this time practised astrology and the occult arts.

In contrast with the apothecary's shop, an interesting account is recorded of the contents of a surgeon's house and shop in 1545. It is said "to have been one of three stories and stood in a row with smaller houses." It contained eight rooms, including the surgeon's shop and two cellars. Only three of the rooms were furnished—the

hall, the shop and the chamber over it. The furniture seems to have been very sparse, for all that is mentioned are " one table, two joyned stools, an easy chair, and in the corner, a cupboard with four legs and a locked chest. The walls were covered with two old pieces of tapestry and the stone floor was laid with rushes."

Another room contained " an old wainscot chair, a buffet stool, a round table and a red-backed cushion." His chemical apparatus included " one latten (bronze) and two brazen mortars, a metal melting pan, a dial of troy weights, and things (pots) of pewter with which to box salve."

The shop of a physician, who evidently made his own preparations, is also described in an inventory dated 1551. In it there were " 2 fair counters with locks and keys. The drugs in pots were ranged on 21 shelves which were hung with painted valances in yellow and red. There were also 19 syrup pots, 33 great gallipots, 20 pottle glasses and many smaller glasses or bottles. There were also large bottles of waters distilled from rose leaves, dill seed and other aromatics, 9 dozen phials, 9 pairs of scales, 9 spatulas for making ointments, and a styllatory with a pewter head." This physician apparently carried on business the same as an apothecary.

These are not imaginary descriptions of the shops of the period, but have been extracted from authentic contemporary records.

CHAPTER XIV

KING HENRY VIII AS AN APOTHECARY

AMONG the accomplishments, doubtful and otherwise, usually attributed to Henry VIII, historians appear to have overlooked his special interest in the art of the apothecary.

That the first Act regulating the practice of medicine was passed during his reign shows, that he was not neglectful of the progress of the art; but that he had a practical knowledge of compounding drugs and devising preparations is perhaps not so well known.

There is evidence of this in a contemporary manuscript, now in the British Museum, which formerly belonged to Sir Hans Sloane. It is entitled, " A Booke of plaisters, spasmadraps, ointments, pulthes, etc. devysed by the King's Majestie, Dr. Butts, Dr. Chambre, Dr. Cromer and Dr. Augustin."

It is a large thin quarto volume consisting of 94 folios, the majority of which are still in good condition and the writing legible. It contains 130 prescriptions, comprising 39 plasters, 4 spasmadraps, 50 ointments, 5 balms, 12 waters, lotions and decoctions and 8 pulthes (poultices or cataplasms), many of which are inscribed " devysed by the King's Majestie," while others are attributed to the four physicians named.

Sir William Butts was an M.D. of Cambridge and

Principal of St. Mary's Hostel. Henry VIII had the greatest confidence in him as a physician, and he also acted in the same capacity to the Princess Mary. He was a friend of Wolsey, Cranmer and Latimer. He appears in Holbein's famous picture in the Barber-Surgeons' Hall and was introduced by Shakespeare into the play of *Henry VIII.*

Dr. John Chambre was a native of Northumberland and became a fellow of Merton College, Oxford. He took his M.D. at Padua and on his return to England was appointed physician to the King. He was made Dean of St. Stephen's, Westminster, and a Canon of Windsor.

Of Dr. Walter Cromer little is known. He was admitted a fellow of the College of Physicians in 1530 and was sent by the King to Esher to attend Cardinal Wolsey. He probably received his appointment at Court shortly afterwards.

Dr. Augustin or Augustinus was a Venetian by birth, who settled in England and eventually became domestic physician to Cardinal Wolsey, by whom he was doubtless introduced to the King. He became a fellow of the College of Physicians in 1536.

It is notable that the majority of the prescriptions are for external application and were probably used by the King in his later years, when he became very stout and suffered from various affections of the legs. Thus we have a "plaister to resolve humoures where there is swellynge in the legges"; "a plaister to resolve and cease payne"; "a plaster to take awaye inflamacons and cease payne and heale excoracons"; and another "to ease the payne and swellyng about the ancles," also one

for "waterish humoures in the legges," indicating that Henry suffered from dropsy.

Many of the prescriptions are of great length, some containing as many as seventy ingredients, so only the more interesting, such as those devised by the King himself, need be recapitulated. The first is entitled

The King's Majestie's Own Plaster.

Take the rootes of marshe mallowes, washe and pike them cleane; then slytte them and take out the inner pythe and cast it awaye and take the other parte that is faire and white and cutt them in small peces and bruyse them a lyttle in a mortar and take of them half a pounde and put them in a newe erthen panne. Then put thereto of linsede and fenugrec of eche two unces, a little bruysed in a mortar, then take malvesie (malmsey wine) and white wyne of eche a pynte and styrre all these together and lett them stand infuse two or three dayes. Then sett them over a softe fyre and styrre it well till it waxe thicke and lyke a slyme, then take it from the fyre and strayne it through newe canvas. Then you have your muscellage redye to make the plaister with. Then take of fyne oyle of roses a quarte, and washe it well with rose water and white wyne, then take the oyle cleane awaye from the wyne and the water, and sett it over the fyre in a brasse panne, alwayes styrring it, and put thereto the powder of lytherge of golde, and of silver, of eche of them viij unces, ceruse vj unces, redde corall, ij unces, bole armeniac, sanguinis draconis of eche of them i unce, and in any wyse lett them be fynely powdered and cersed. Then putt them into the oyle over the fyre, alwayes styrring, and lett not the fyre be to bigge for burnyng of the stuff. And when it begynneth to waxe thicke then put in vj unces of the said muscellage by a lyttle at ones, or ellse it will boyle over the panne.

When it has boyled ynough, which you shall perceave by the hardnese or softenese thereof when you droppe a lyttle of it on the bottome of a dyshe or sawcer, or on a colde stonne. Then take it from the fyre, and when it is newe colde make it in rolles and wrappe them in parchement and kepe them for your use. This plaister resolves humoures where there is swellynge in the legges.

A plaster devysed by the King's Majestie to heale ulcers without payne made with perle and the woode of ligni guaiaci.

Take the juce of night-shade, mallowes, mellilotte flowers, consolid [daisy] maior, media, and minor, sage and plantayne, of eche two unces, of rose water and water of honey-suckle flowers of eche two unces, and then take a pynte of fyne oyle of roses and take long wormes slytte and well washed in white wyne two unces, putt the wormes in the waters and add them to the oyle and boyle them together over a softe fyre, still styrring it untyll you do perceave the juces and waters be consumed, then strayne them and putt to the oyle. Then add the folowyng fynely powdered and preparated. Take lytherge of golde and ceruse of eche iiij unces, of redde corall and the typpes of hartes horns burned, one unce of eche, purely powdered, then take of perles, fynely powdered, half an unce. Boyle them all together on a softe fyre, evermore styrring tyll it be plaster wise, and in the boyling put in lyttle by lyttle ii unces of the decoction of ligni guaiaci boyled strongly in two partes of white wyne and one parte of rose water. And last of all in the coolyng, putt in the powder of chamomell flowers and powder of redde damaske rose leaves of each half an unce, and make it up in rolles and kepe it to your use.

The "lytharge of gold" mentioned was the oxide of lead.

A blacke plaster devysed by the King's Hieghness.

Take gummi armoniaci ℥ iv, oloi ompharmi ℥ iii, fyne therebintyne ℥ vi, gumi elemi ℥ j, resini pini ℥ viij. Boyle together on a softe fyre of coale in a faire earthen basin, styrring alwayes untyll it be plaster wyse and so make it in rolles and kepe it for your use.

A plaster devysed by the King's Majestie to resolve and cease payne and to mollifie being made without oyle with the fatte of capons and the marie of a calf.

Take of cincquefoil, of violett leaves, of eche halfe an unce, of the flowers of water lillie 1 unce, of greate reysynes without stones ℥ ss. Boyle these together in rose water and the water of honyesuckle flowers as much as shall suffyse, then take and strayne it and with the decoction drawe the muscellage of the rootes of marshe mallowes and of quinsede and of linsede of each i unce. Then take the suett of hennes ℥ iiii the marie (marrow) of the thieghe bone of a calf, cleane and clarified with rose water and the water of honye suckle flowers more than luke warme. Then take lytherge of golde fynely powdered and preparated before, then putt it to the suett and boyle them together over a softe fyre evermore styrring and feding it with the muscellage a lyttle and lyttle till it be plaster wyse.

The notes attached to some of the prescriptions form an interesting record of the places where the King stayed; thus the following plaster was "devysed at Grenewyche."

A plaster devysed by the King's Majestie at Grenewyche, and made at Westminster, to take awaye inflamacons and cease payne and heale excoracons.

Take of plantayne leaves, violett leaves, honye suckle leaves, consolid [daisy] maior and minor, of eche a handful. Beate all these together and strayne them.

Take the fatte of capons or hennes ℥ viij, boyle them with the juces untyll the juces be consumed, then strayne it, and putte in these things folowyng, litherge of silver ℥ viij, redde corall ℥ ii, cornu cervi usti ℥ j, cornu unicorni ℥ ii, margaritaris ℥ ss. preparate and powdre all these fynely and putt them in your potte and boyle them alltogether over a softe fyre still styrring it untyll yt [. . .] then putt thereto these muscellages folowing, take of quinsede, of linsede ana ℥ i, draw the muscellage of them with rose water and white wyne wherein therebintyne has been lying four dayes infuse being oftymes moved ones or ii in an houre and take of it ℥ ii and put thereto the others and make a plaster.

This recipe is notable for the use of the horn of the unicorn which was so highly esteemed and valued as a remedial agent in the sixteenth century.

"*A plaster of the King's to heale and drye made at St. James.*"

Take oyle of rosys washed with plantaiyne water ℥ vi and lytherge of golde washed wyth white wyne and water of chamomell, fynely powdered ℥ iii, the juces of prevett, consolid minor, hartesease, lactuce, of eche ℥ ii. Boyle your juces with your oyle to the consumption, then strayne it and putt your lytherge to your oyle and boyle them guether over a softe fyre, stirring, putting therto the muscellage of the pulpe of IIII dates . . . drawen with the wyne of nightshade, and when it be bodyed to a plaster take it from the fyre, and in the cooling putt therto fynely powdered . . . boone combusted ℥ ii farine avenarum ℥ iss et fiat emplastrum.

Another "*Plaster that healeth devysed by the King's Majestie and made at Westminster.*"

Take oyle of rosys washed in water of Gardyn lillies ℥ x, the juce of prevett, consolid minor, hartes ease that

groweth on the wall, lactuce, of eche ℥ ii. Boyle them in your oyle to the consumption of the juces, long wormes slytte and washed with white wyne, boyle also wyth the oyle ℥ vi, then strayne your oyle into a faire vessell and putt therto of lytherge of golde washed with white wyne and water of Chamomell ℥ ii, tutie, redde corall combusted and fynely powdered ana ℥ ii. Boyle them to guether over a softe fyre, evermore styrring, putting therto by a lyttle and a lyttle muscellaginis seminis psilii [fleabane] ℥ iss., the pulpe of dates, drawe the muscellage with the water of night shade and when it is almost plaster lyke putt therto white wax ℥ i. Boyle all toguether untyll they be well bodied, then take them from the fyre styll styrring, and in the coolyng putt thereto farine avenarum ℥ iss. et fiat emplastrum; augmente into the same receipte to the juces iii. unces of the juce of the lyver worte and ii. unces of the muscellage of the mydle rynde of the elme tree drawen with the saide water with which the other foresaide muscellages be, et fiat emplastrum.

Blacke plaster of John de Vigo secundum Dr. Butts.

Take oyle of rosys iiii. unces, calfe suett one unce, the juce of plantaiyne, the juce of knott grasse of eche one unce, rose water half an unce, sett the oyle and the suett over a softe fyre and putt therto the juces and lett them boyle together tyll the lycors be consumed allwayes styrring it. Then take lytherge of golde and of silver of eche ℥ vi, tutie preparate, minii (red lead), of eache one dramme, ceruse v drames, all these in fyne powdre putt into the oyle alwayes styrring it and lett it boyle tyll yt loke blacke, And when yt is ynough sett it from the fyre and in the cooling putt therto vi drames of therebintyne washed with . . . water and one drame of white waxe and make upp in rolles. This plastre is goode for to heale and drye upp olde ulcers in the legges.

John of Vigo, who originated this plaster, flourished between 1460 and 1519, and was surgeon and physician to Pope Julius II. The recipe survived him and was in general use in Europe for at least three hundred years as a sparadrap to apply to syphilitic eruptions. Ambroise Paré gives a formula for it which contains earth-worms and frogs, macerated in white wine with golden litharge and with the fats of the pig, calf and vipers.

The following is an example of the prescriptions for spasmadraps or dipped plasters, of which four are given.

A Spasmadrap or dypped plaster, devised by Dr. Butts.

Take oyle of rosys and white waxe of eche one pounde, white lead one pounde and a half, set the oyle and waxe over a softe fyre tyll the waxe be relented with the oyle and put in the white leade by a lyttle and a lyttle finely powdered, alwayes stirring it tyll it waxe blacke and thicke lyke a plaster, then take it from the fyre and dyppe therein fyne peces of lynen clothe and hange them on a faire smothe staff tyll they be colde, and sleeke them on a sleke stone, and make them smothe on bothe sydes, and cutt them according to the broadeth of the ulcer, and peyck them full of smalle hoolys. One plastere will sve (serve) v or vi tymes yf yo torn at everye dressing the contrarye syde. This is veray goode to heale ulcers in the legges.

Spasmadraps were melted plasters into which strips of linen were dipped, and when cool were smoothed out with a stone or a spatula before being applied.

Sometimes the plaster was melted and made liquid with olive oil and the linen then dipped into the mixture.

A simple spasmadrap was made with white wax, almond oil and turpentine melted together and then spread on coarse linen or paper.

Of the prescriptions for ointments the following is an example:

"*Devysed by the King's Majestie at Cawoode to drye excoriacons and comforte the membres, called the Swete Ointment.*

"Take oyle of rosys well washed with warme white wyne VIII unces, redde leade one unce, redde corale III unces, margarits I unce, cornu unicorn II unce. Boyle all your metalls and oyle together tyll it be unguentlyke, then put in these juces folowing of eche one unce and a halfe, beside the fyre, evermore styrring tyll they be wrought all in, woode byne, mallowes, plantayne, the tendre leaves of the aple tree, and solatro, and last of all the powdre of chamomell flowres, violett leaves, rose leaves and iris, of eche VI unces et fiat unguentum."

"*The King's Majestie's ointmente to restrayne, devysed at ffoderingaye and made at Hampthill.*"

Take of oyle of rosys VIII unces, take the muscellages of quynsede and seminis psilii (fleabane) of eche of them one unce, then take lyherge of golde iiii. unces, redde corall ʒ vj. Boyle your oyle and your metalls and the muscellages together over a softe fyre evermore stirring tyll it be unguent like. Drawe the muscellages with white wyne, wherin the barke of the slooe tree hath been boyled a goode quantitie and last of all putt in fynely pouldered these thinges folowing, the flowres of pomegranate, rose leaves, the case of pomegranate seede, sumach and redde sawnders, of eche ʒ ii., and worke them all to guether with a quantitie of white wyne to give penetracon et fiat unguent.

Most of the prescriptions for balms are too long for quotation, as some contain as many as sixty-eight ingredients.

The simplest is

A balme for palseyes and aches.

Recipe: Therebintine clarissime ℥ viij. Thuris, masticis, ana. ℥ ii. Take also aloes, sandarac, castor, offis dactilorum, radicis diptany, consolid minor ana ℥ i. Stille these together in a limbike of glasse and stoppe it veray cesse and so kepe it to youre use.

Of the liquid preparations, some of the lotions are interesting, such as the following devised by the King:

A decoction devysed by the King's Majestie to restrayne humors.

Take the leaves of centgrene, the leaves of nightshade, the leaves of roses, ana one lb., the flowers of pomegranates, of sumach, hipocistidos, galles, ana ℥ i, the barke of the barberrie, the barke of the slooe ana ℥ ii. Set them in faire water and white wyne, and make thereof a decoction.

A Lotion to Drye Up All Waterishe Humors in the Legges.

Take a dishfull of ashes of the wood of the oke alone, and as much of the ashes of the cuttyngs of vynes. Then take two galons of faire water and a handful of rosemarye and a handfull of sage, another of plantayne, seethe these herbs in your water, then strayne them and make a lee of them and your ashes, and strayne yt thorough a canvas clothe three or iiii. tymes till your lee be stronge, and then warme it, and with sponges make fomentacons therewith evenynge and mornynge.

Of the poultices, one example devised by Dr. Butts will suffice in which nightshade as an anodyne is again employed.

A pulthes to cease payne devised by Dr. Butts.

Take a fatte pece of veale or ellse a fatte capon and boyle it in water or ellse white wyne and strayne it from the fleshe, and sett the saide lycor over the fyre agayn, and put therto these thinges folowing, of mallowes ii. unces, of violett leaves, of night shade ana ℥ i. lett them boyle untyll they be very softe and tendre, and powre awaye the licor from them, and putt therto barley water as much as shall suffise to make it a pulthes.

Other recipes are stated to have been made for the King while staying at Dover, Canterbury and at Knolle.

It may be gathered from the prescriptions quoted that Henry VIII had more than a superficial knowledge of the art of the apothecary.

CHAPTER XV

THE SOCIETY OF APOTHECARIES AND ITS HISTORY

AT the beginning of the seventeenth century, the apothecaries were incorporated by a charter granted by James I, on April 9th, 1606, although they were still united with the grocers.

The dissensions and disputes which had been carried on between them for many years now became acute and resulted in a crisis, which led to the complete separation of the two bodies.

In 1615, the apothecaries petitioned the King to grant them a separate incorporation, and their cause was taken up and championed by Theodore de Mayerne and Henry Atkins, who were both physicians to James I and men of considerable influence. They were supported and doubtless advised as to the condition of affairs by Gideon de Laune, who was born in 1562, and came from a Hugenot family that had settled in London. He had been apothecary to Queen Anne of Denmark and afterwards came to the city. He lived in Blackfriars and called himself a "Pharmacopœius," which probably meant, that he was also an importer of drugs. He died a wealthy man, leaving £80,000, and was buried in St. Anne's Church, Blackfriars, in 1640.

On the representations of Mayerne and his colleagues, King James, who had remained a good friend to the

apothecaries, granted them a new charter on December 6th, 1617, which formed them into a separate Company or Guild from the grocers, under the name of the Master, Wardens and Society of the Art and Mystery of the Apothecaries of the City of London.

This charter conferred upon them the monopoly of keeping an apothecary's shop, and rendered it unlawful for the grocers or any persons "to make or sell, to compound, prepare, give, apply or administer any medicines or medicinable compositions, viz. Distilled Waters, Compounds or Olea Chimica, Apozemata, Sirrups, Conserves, Eclegmata, Electuaria, Condita, Medicinalia, Pillulas, Pulveres, Troches, Olea, Unguenta, Emplastra, or by any other way to use or exercise the Art, Faculty, or Mystery of an Apothecary or any part thereof, within the City of London and the Suburbs or within seven miles of the City."

This charter of separation was strongly opposed and resented by the grocers, and it is stated that "Eight of the Grocers were even mad against the Apothecaries for separating from them, with whom they were one Company, before the Grocers appropriated to themselves the whole buying and selling of drugs, and the distillation and selling of all waters within the City of London and seven miles thereabouts, to the Impoverishing of many persons and their families."

But King James for once belied his character and stuck by his charter, and in reply to these complaints stated: "I myself did devise that Corporation" (the Apothecaries) "and do allow it. The Grocers who complain of it are but traders. The Mystery of these Apothecaries were belonging to the Apothecaries wherein

the Grocers are unskilful, and therefore I think it fitting they should be a Corporation to themselves. They" (the traders) "bring home rotten wares from the Indies, Persia and Greece, and here with their mysteries make waters and sell such as belonging to the Apothecaries and think no man must control them because they are not Apothecaries." The reason for the separation is thus referred to in the Charter: "In these latter years, very many Empiricks and unskilful and Ignorant men and unexperienced, do inhabit and abide in our City of London and the Suburbs and are not well instructed in the Art and Mystery of the Apothecaries, but are therein unskilful and rude, and do make and compound many unwholesome, hurtful, deceitful, corrupt and dangerous medicines, to the great peril and daily hazard of the lives of our subjects."

The division of the Apothecaries from the Grocers appears to have been part of a general movement at that period to separate all those callings which bordered on professions from those which were trades, and an attempt was made by the Surgeons to separate from the Barbers; but they were unable to carry this out until 1745.

The Charter empowered the Master and Wardens to enter any shop where the Mystery and Art of the apothecary was exercised, to examine and try all persons professing the Art as to their knowledge and skill, and to examine their drugs and preparations and burn all they deemed corrupt or unwholesome before the offenders' doors.

The first Master of the Art and Mystery of the Society was Edmond Phillips, and Stephen Higgins and Thomas Fownes were appointed Wardens.

To uphold the dignity of the newly formed Society, Livery gowns, "faced with sattin and welted with velvet," were ordered to be provided by the assistants for the meeting on 6th of May, 1618."

In September 1618, the Society began to function, and searchers were appointed to carry out the duty of visiting the shops, to seek for defective and bad medicines in London, Westminster and Southwark. The general Search Day was fixed for the Thursday after Whitsun week, when the Searchers met at St. Paul's at five o'clock in the morning.

Several persons were soon summoned, and among them was one Hanck, a weaver, who, with a person called Pelwell, was ordered " thereafter neither to make nor sell any more medicines."

On June 28th, 1619, it was ordered that all the Company should have the new Dispensatorie Troy Weights, which were afterwards known as Apothecaries' weights, and which have since remained in use for the dispensing of medicines.

It was not until April 6th, 1620, that the Society, which is the only Livery or Company bearing that title, received a grant of arms, which consists of a figure of Apollo astride a dragon in a shield, with unicorns as supporters. A rhinoceros forms the crest, evidently chosen on account of its traditional use as an antidote to poison, and the motto is "Opiferque per orbem dicor."

To become an apothecary it was first necessary to take up the freedom of the Company, and no apprentices could be received without undergoing an examination in the rudiments of Latin before the Master and Wardens. It

was also found necessary to ascertain if the apprentices could decipher the very illegible script in which the physicians wrote their bills.

The apprentice, who had to serve eight years to his master, was required to take the following oath on beginning his term, which was ordered "to be administered by the Master and Wardens of the Apothecaries unto every apprentice of the Company," in 1670:

"You shall swear to be good and true to our Sovereign Lord the King's Majesty, His Heirs and Successors, and well and truly you shall serve your master for the term of your apprenticehood and in lawful and honest causes you shall be obedient unto him and unto the Masters, Wardens and Assistants of this Company and have them in reverence. The lawful secrets of the said Fellowship you shall keep, and give no information or instruction thereof to any person but the said Fellowship.

"In all these things you shall well and truly behave you and surely keep your Oath to your Power.

"So help you God.

"And if it fortune you to depart from your Master his service, you shall not serve any person out of the said Fellowship without licence of the Master and Wardens for the time being, upon pain to forfeit and pay to the use of the Company such penalty as shall be assessed upon you by the Master, Wardens and Assistants for the time being.

"God save the King."

The instructions given to apprentices show the fatherly interest manifested in the text of the indentures, that survived until the eighteenth century. The apprentice lived with the family in the house of his master, who

thus stood *in loco parentis* to him, and the Company further instructed him as follows as to his behaviour:

"You shall constantly and devoutly on your knees every day serve God, morning and evening, and make conscience in due hearing of Divine Service and the word preached, and endeavour the right practice thereof in your life and conversation.

"You shall do diligent and faithful service to your Master for the time of your apprenticeship and deal truly in what you shall be trusted with. You shall often read your indentures and see and endeavour yourself to perform the same to the utmost of your power.

"You shall avoid Conventicles, Unlawful meetings and all Evil company, and all occasions which may tend or draw you to the same, and make speedy return when you shall be sent of your Masters or Mistresses errands.

"You shall avoid all idleness and be ever employed either in God's service or about your Master's business.

"You shall be of fair, gentle and lowly speech and behaviour to all men and especially to your Governours. And according to your carriage, expect your Reward for good or ill from God and your Friends."

A practical knowledge of herbs and simples was soon found necessary for the apprentices and others studying the apothecary's art, and botanical excursions, or herborizings, were organized in the summer of 1627. On June 21st of that year there is record that the meeting-place for the first of these gatherings was at "Graies Inne in holborne at 5 o'clock in the morning."

Stewards were appointed to arrange and manage these "Simpling days," as they were called, and the search for medicinal plants was solemnly conducted by the Master and Wardens. Great importance was attached to these

excursions, which were carefully arranged, and fines were imposed for non-attendance at the "Simpling." The herborizings eventually led to the decision to plant a physic garden, and, in 1673, land at Chelsea was leased to the Company for a period of sixty-one years by Charles Cheyne, the Lord of the Manor.

The land now occupied by the Physic Garden was originally selected by the Society as a suitable site near the river for building a barge house and, as the whole of it was not required for that purpose, they decided to utilize the remainder for growing medicinal herbs and plants.

There was a quaint and curious custom with the apothecaries on taking up their freedom of the Company, to present a silver-gilt spoon, and in their annals a record was kept of these gifts. In an entry dated November 1629, the number of spoons presented that year amounted to 186 ounces 2 drachms in weight, and, with the exception of three score and ten, these were ordered to be sold.

There are some other interesting records in the annals about this time worthy of notice. On May 25th, 1630, at a Court, the "pretended Bezar stones (Bezoar) sent by the Lord Mayor to be viewed were found to be false and counterfeit and fitt to be destroyed, and the whole table (court) certified the same to the Lord Mayor."

Bezoar stones, which were considered to be of great value at that time as antidotes to poison, were regarded as Royal gifts.

Apparently the Lord Mayor was not satisfied with the judgment of the Company, for shortly afterwards "a jury composed partly of druggists and partly of apothecaries was impanelled, solemnly, at the Guildhall before

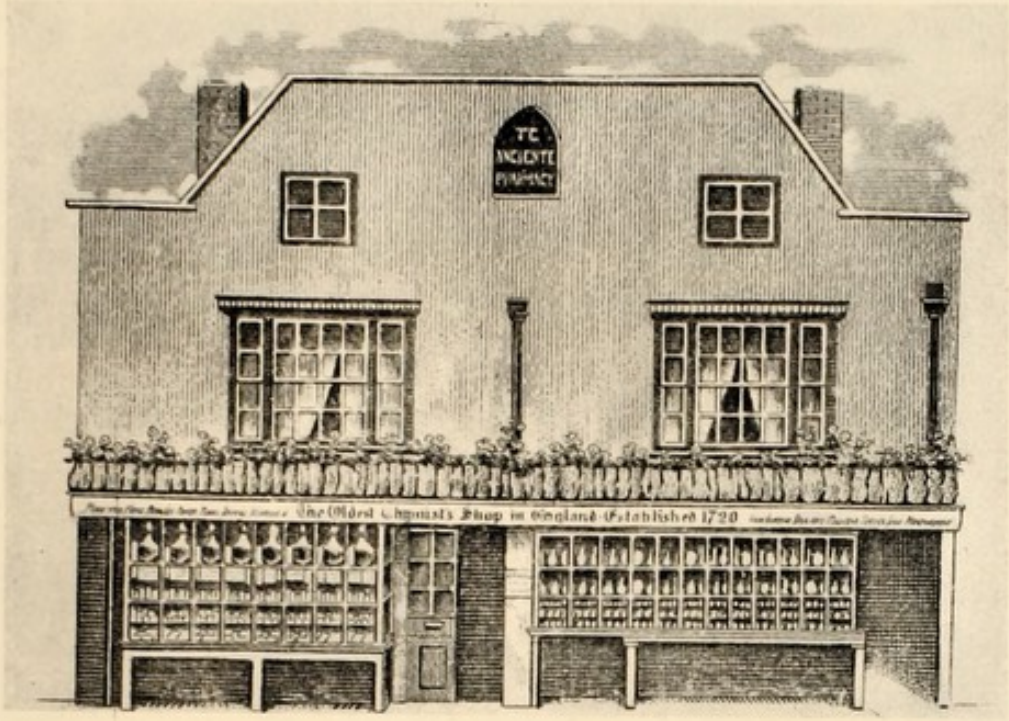
the Lord Mayor and Aldermen, to determine the genuineness or falsity of the same Bezoar stones." The jury confirmed the judgment of the Apothecaries' Company and "adjudged the stones to be burnt," and burnt they were accordingly.

In November the same year, during a "search for bad medicines," some "Brooke's powder" was found, a small box of which was taken to the College of Physicians. An order was sent by the President of the College to the Master of the Apothecaries to attend the College and bring the remainder of the powder. The Court, however, refused to be ordered by the College, but stood on their dignity and refused to carry the powder to the physicians. Eventually it was arranged to send a deputation from the Company, and, accompanied by the inventor of the powder, Mr. Brooke, they went to the College, but, whether by intention or forgetfulness, they did not take the powder.

It was afterwards brought and viewed, and the College kept two boxes and returned the remainder "unbeaten upp" to the owner, Mr. Brooke.

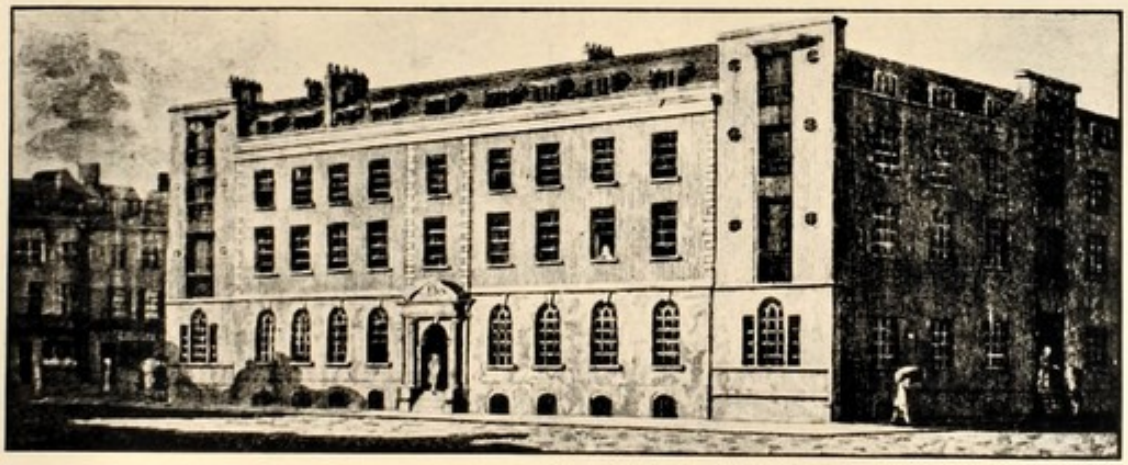
On December 16th, 1630, the Master, when searching the house of one John Simson in St. Paul's Churchyard, found a "bad pill." He gently reproved Mr. Simson, who was offended, and gave the Master "unbecoming speeches" or otherwise used strong language. For this he was summoned to the Court and solemnly rebuked and fined after submission.

The Society of Apothecaries with other City guilds was represented in the annual procession on the river on Lord Mayor's day, and in 1631, provision was made for the first time to provide a barge, together with three banners



THE OLD SHOP AT KNARESBOROUGH

(See page 279)



THE APOTHECARIES HALL IN 1793

and two long streamers, with staves and papers to wrap them in. The barge was to carry at least fifty people and oars were to be provided, also "a steeresman and hearbes," the latter no doubt to counteract the evil smells which might arise from the river.

During the first fourteen years of its existence, the Company had no hall of its own but had rented Paynter Stainer's Hall for ten pounds a year, and in 1629 they removed to the Scriveners' Hall near the Old Bailey. The Charter gave the Company power to acquire a hall, but this was not exercised until 1633, when a house and grounds known as Cobham House that belonged to Lady Howard of Effingham were purchased, mainly through the instrumentality of Gideon de Laune. This building stood in Water Lane, Blackfriars, immediately behind the present Ludgate Hill Station.

The Apothecaries' Hall, as well as that of the Grocers, was destroyed in the Great Fire in 1666, and the Company had to sell most of their plate to raise money to try and build a new one. Rigid economy was enjoined, all feasts being abandoned, and in 1669 a beginning was made to erect a new building. In 1671 a Chemical Laboratory was ordered to be built in addition to the Dispensary (which had been instituted in 1623) and this building, which still stands on the original site, was enlarged and improved in 1786.

Leach, describing the new Hall in 1695, says: "It is seated almost opposite the Paved Alley that leadeth to the Ditch-side down steps against Bridewell Bridge. This Hall is a good building with a fair pair of gates that leads into an open court paved with broad stones, at the upper end of which is the Hall and other apartments."

The Master was allotted the garrets over the kitchen on the north side of the Hall for his lodging, and " to lay up Rosemary and other herbs."

In April 1684, the King demanded the surrender of the old Charter, but a new one was granted, by which the Company became a livery, and on the abdication of James II, the original document was eventually restored.

In the reign of Queen Anne, Prince George of Denmark, who was then High Admiral, applied to the Society to know if they would supply the Navy with drugs, as it was very badly served with medicines at that time. To this the Society agreed, and the Queen granted it the privilege of serving the Fleet, so that all surgeons in Her Majesty's service were obliged to buy their drugs at the Apothecaries' Hall, and the mixing of all stock medicines for the Navy was to be actually viewed by the Master and Wardens. This led to the establishment of what was called the " Navy Stock," and from this the surgeons' medicine chests on ships of war were replenished.

In 1708, while the long dispute between the physicians and the apothecaries was being carried on, and the latter were being constantly attacked for charging extortionate prices for their drugs, a Mr. Lawrence openly charged the Company with making exorbitant profits on the sale of Peruvian bark. " Having abused the Master, calling him a villain and other opprobrious names, and saying that the Company bought Jesuit's bark at three shillings a pound and sold it to surgeons at twenty shillings, he was summoned to appear before the Court; but he would not come, therefore he was not permitted to have any apprentices."

The importance of the Physic Garden at Chelsea to the

Society as a medium of instruction to apprentices, as well as for the practical study of indigenous medicinal plants, began to be realized early in the eighteenth century, and the garden became better stocked and cultivated.

The lease was running out when Doctor, afterwards Sir Hans Sloane, bought the land on which the Physic Garden stood from William, Lord Cheyne, in 1712, and conveyed it to the Society of Apothecaries by deed in 1722. He stipulated that "to the end the said garden might at all times thereafter be continued as a physick garden and for the better encouraging and enabling the Society to support the charge thereof, for the manifestation of the power, wisdom and glory of God in the works of creation, and that their apprentices and others might better distinguish good and useful plants from those that bore resemblance to them and yet were hurtful."

The sum of five pounds per year was to be paid to Sir Hans Sloane or his heirs for ever, and fifty specimens of distinct plants, well dried and preserved, which grew in their garden the same year, with their names or reputed names, were to be delivered annually to the President, Council and Fellows of the Royal Society of London until "the number of two thousand had been attained."

Since that time the garden has been used by students of medicine and pharmacy for the study of practical botany and has assisted them in the identification of medicinal plants.

It is probably not generally known that theriaca, or treacle as it was commonly called, was publicly made in London, as was customary in several cities in France, Italy and Germany. This historic remedy was still being

used in England down to the middle of the eighteenth century, and according to the records of the Society of Apothecaries, "in 1722, five hundred pounds of Venice Treacle publicly made and potted was sealed with the Company's seal."

In 1764 the old barge, which had seen so many years' service, began to get unseaworthy, and the Company decided to build a grand new barge for river pageants to replace it. This vessel was to have crimson damask coverings for the back of the Master's seat and an occasional footstep for his use, as well as special cushions. The Beadle was also to be re-clad in a gown of blue cloth with yellow trimmings, and a set of new flags and streamers were ordered at a cost of £48, exclusive of silk. These banners bore the Royal arms, the City arms and the arms of the Company with the crest and supporters. This was the last barge they built, and it was eventually sold in 1817.

In 1805, the apprentices were forbidden to bathe in the river on their herborizing excursions, and these meetings were reduced to four. Those attending them were to be allowed a shilling each for breakfast and a plain substantial dinner.

One of the last "searchings" is recorded in 1808, when an apothecary named Hugh Davies in Piccadilly "was found lacking in stock of certain drugs which he reasonably was bound to keep, and also those he did keep were found to be of bad quality. He was therefore summoned to attend the Court, but made excuses, which were not accepted, and was severely reprimanded."

These are but a few of the interesting incidents in the early history of the Society of Apothecaries.

CHAPTER XVI

APOTHECARIES' BILLS AND PHYSICIANS' FEES IN THE SEVENTEENTH CENTURY

FROM the early part of the seventeenth century the apothecaries appear to have gained a reputation for making excessive profits on the sale of drugs and medicines. After they had become a separate corporation and improved their status, they increased their charges to such an extent, that the physicians began to grow jealous of their general prosperity and to resent the monopoly that had arisen regarding the sale of drugs. Books and pamphlets were written blaming them for their rapacity and complaining especially of their charges to the poor.

The author of "The Accomplished Physician" thus comments on their methods. "If the apothecary finds you costive he sends you a clyster at the price of half-a-crown, which by consulting the 'Accomplished Physician' you may learn how to make yourself for three halfpence. If he apprehends your stomach to be oppressed, he orders his man to boil a little cardamoms in water, strain it, and put to it three or four spoonfuls of rank oil of sweet almonds, to cause you to vomit and carry off a little phlegm, and for this he charges you

half-a-crown, which you can make yourself for two-pence."

We can form some idea of the apothecaries' charges at this period from several of their bills to patients which have come down to us.

Thus in the Household Books of Lord William Howard there is the following entry, dated September 25th, 1612:

"Mr. Hicks, the potticarii was paid XX*s.* for pils for Mrs. Marie. 14 grains of musk for Mrs. Marie, cost 11*s.* and VI*d.*"

Mr. Hicks was an apothecary in London.

"Paid Mr. Adamson, an apothecary of Keswick, for XXII dayes and his physick, £XIII. VI*s.* VIII*d.*"

Another bill is recorded in the appendix to the "Eleventh Report of the Historical Manuscripts Commission," which was found among the papers of the Marquess of Townshend, and is endorsed "The Apothecaries' Bill," dated 24th June, 1619.

"Sir Roger Townshend's account.

Grene ginger	. . . . .	7*s.*
Tabacco	. . . . .	2*s.*
Grene ginger	. . . . .	8*s.*
A masse of pills	. . . . .	5*s.*
An electuarye	. . . . .	3*s.* 6*d.*"

Under the name of Mr. Stanhope Townshend is the following bill, dated 12th September, 1618:

" A clyster	3*s.*	4*d.*
A julep	3*s.*	
A cordiall with Bezoar stone	3*s.*	
The cordiall julep	3*s.*	
Hearbs for brothe	4*d.*	
Rose water	6*d.*	
A suppositorie	6*d.*	
Another suppositorie	6*d.*	
An unguent	3*d.*	
A purge	3*s.*	
Purgeing pills	2*s.*	6*d.*

In the diary of William Blundell of Lancashire, who was an ardent Royalist and fought in many battles during the Civil War, there are some interesting entries throwing a light on the practice of the apothecary.

In 1681, the old cavalier was taken ill and his apothecary, Dr. Worthington of Wigan, was summoned by his man, Master Thelwall, who records the following account in his diary :

" After my master had been long ill of a violent cold, Dr. Worthington came first unto him on the 8th of January. He staid two nights and received for his pains £1 10*s.* He brought along with him, a lohoch, ten pills, with a bottle of spirits somewhat bigger than one's thumb, and a paper of lozenges, with French barley and several ingredients for making the water thereof.

" On the eleventh day he sent a glyster, with a large pint bottle of a cordial julep and a small bottle of syrups, to be sucked up with a liquorice stick, also some small quantity of sal prunella.

" The doctor was with my master the second time on the 17th January and received for his pains 15*s.*"

The apothecary's bill is recorded in full and dated 24th October, 1681 :

" Spirits	4*s.*	6*d.*
An Ointment	2*s.*	
January 8.		
Spirits	4*s.*	6*d.*
Ten pills	2*s.*	
A lohoch	2*s.*	
Lozenges	4*s.*	
Jujubes and Sibertines	8*d.*	
French barley	1*s.*	
Ingredients	1*s.*	6*d.*
Syrups	3*s.*	
A cordial julep	10*s.*	6*d.*
A glister	2*s.*	6*d.*
January 11.		
Syrups	3*s.*	
White powder		4*d.*
Five pills	1*s.*	3*d.*
The oiled sugar	7*s.*	
Syrups	5*s.*	6*d.*
Oil of sweet almonds	1*s.*	8*d.*
Spirits of ptisanne	7*s.*	6*d.*
For a messenger	1*s.*	6*d.*
	£3	5*s.* 3*d.*"

Master Thelwall then proceeds to record his master's opinion "of these several things in particular, which is to be inserted for further use," and the cavalier's comments

on the effects of the medicines are both quaint and amusing.

" The spirits first named," he says, " of which twenty-six drops were to be put into one small cup of barley water and beer, had no apparent effect, although he doth not much doubt but that the secret effect might be good. That the like might be said of the pills mentioned in two places, although it seemed that they did somewhat assuage his cough, which was extremely violent.

" The lohoch, a liquor like syrup, did apparently bring up phlegm and was well liked. The lozenges were pleasant and did sometimes stop the cough. Barley water with the ingredients was cooling and pleasant. Syrups, twice mentioned, although of much different prices, seemed to be the same.

" The cordial julep, of which there was a large pint bottle, was pleasant, but the effect was not apparent. The glister, extraordinary effective and good. White powder, supposed to be sal prunella, assuaged the thirst. The oiled sugar, with the spirits ptisanne, besides the extreme dearness, was almost wholly useless, in regard that the patient being much in the mending-hand when they were sent unto him.

" He sent back to the doctor about seven-eighths of the oiled sugar and yet he paid for the whole. The oil of sweet almonds, of which seven or eight drops were taken in a bolus of white sugar-candy, frequently helped the breast, made very sore by coughing."

There is another entry showing how the ladies of the time delighted to dabble in medicine. It was customary to keep a book of medical recipes, and they frequently recommended these remedies to their friends.

"The elder Lady Bradshaw sent a bottle containing as we guess about one ounce of balsam which in her letter she calls Balsam of Sulphur.

"That it must be taken morning and night, three or four drops, naked and alone in a spoon; that it must be warmed before it will drop at all, by reason its thick and clammy."

It is satisfactory to learn from the diary, that eventually the stout old cavalier recovered from his illness and regained his usual health.

The oiled sugars, which proved so ineffective, were made by triturating a small quantity of various essential oils with white sugar, and were usually given as carminatives.

Broth was a common method of administration, and was generally composed of certain herbs mixed with various other ingredients such as calves' lungs, lizards' bones, snails and vipers. Broth of Viper was highly esteemed for its restorative properties and was prepared as follows:

"Take one living viper and remove his head, tail and viscera, excepting his heart and liver. Cut into little pieces and mix it with the blood and add Well water 12 ounces. Put in a close vessel, boil for two hours and strain, and the broth will be made."

Another apothecary's bill of about the same period is one "for attending Mr. Dalby of Ludgate Hill, five days, total amount £17 2*s*. 10*d*." The following are the medicines supplied for *one day*.

August 12.

An emulsion	4*s.*	6*d.*
A mucilage	3*s.*	4*d.*
Gelly of hartshorn	4*s.*	0*d.*
Plaster to dress blister	1*s.*	0*d.*
An emollient glister	2*s.*	6*d.*
An ivory pipe, armed	1*s.*	0*d.*
A cordial bolus	2*s.*	6*d.*
The same again	2*s.*	6*d.*
A cordial draught	2*s.*	4*d.*
The same again	2*s.*	4*d.*
Another bolus	2*s.*	6*d.*
Another draught	2*s.*	4*d.*
A glass of cordial spirits	3*s.*	6*d*
Blistering plaster to the arms	5*s.*	0*d*
The same to the wrists	5*s.*	0*d.*
Two boluses again	5*s.*	0*d.*
Two draughts again	4*s.*	8*d.*
Another emulsion	4*s.*	6*d.*
Another pearl julep	4*s.*	6*d.*

In 1670, Dr. Gideon Harvey, Physician-in-ordinary to His Majesty, published a little book called "The House Apothecary," in which he attacks the apothecaries for their extortionate charges. He recommends his readers to buy their drugs from the druggist, and prepare their medicines in their own homes, "it being a far safer and easier way than sending to the apothecary to be made, and you shall also save nineteen shillings in twenty shillings, according to the extravagant rates charged by many apothecaries in so doing.

"I must tell you," he continues, "I have often seen bills of apothecaries rise to twenty and sometimes thirty

pounds in the time of a fortnight; and what is more, I have known an apothecary's bill so extravagant, that the sum at the bottom of his account amounted to fifty pounds in thirty days, when the ingredients of the whole course could not be computed to stand him in forty shillings.

" In preparing medicines at home you may be certain the ingredients are sound and fresh, and you can have your medicines without attending to the apothecary's leisure, or having the trouble of sending three or four times to his shop for them; and most important of all, you may be assured in so doing you shall save nine pounds in ten, and sometimes forty eight pounds in fifty."

In " The Honest Apothecary and the Skilful Surgeon," another book decrying the apothecaries, published at " The Angel " in Duck Lane in 1656, the author thus extols the superior knowledge of the physicians :—" It is fortunate that the little apothecaries and prescribing surgeons have not much knowledge of the great medicines, such as mercury and antimony, as they would at most times do great mischief with them, using them at unseemly times, as if you laid hold of a club to knock down a louse. Such great medicines should only be used by the physicians, who should reserve them in secret."

Although there is little doubt there was some truth in the charges made against the apothecaries as to their high prices, the physicians also were by no means moderate in their fees. In the " Memoirs " of the Verney family, Dr. Denton writes :

" Sir Theodore Mayerne is buryed and died worth £140,000."

Sir Ralph Verney thought £30 too small a fee to pay Dr. Denton for his attendance on his wife during her confinement, "but for his pressing poverty he would have sent him £50," which is equal to about £200 at the present time.

In the account books of Sir Daniel Fleming the following fees are recorded as paid to the doctor in 1659:

"To Doctor Dykes for comeing and laying plasters unto Will, 10s.

"For his plasters and paines, contributed towards the cure of Will, the sum of £5."

In contrast to this is the entry recording the fee for the midwife's services, dated July 30th, 1659:

"Given unto Daniel Harrison's wife for being my wife's midwife, 5s."

It is further stated in the "Memoirs," that "Sir George Wheler's sickness, after a Christmas dinner at Dr. Denton's, cost him the best part of £100. He had caught a chill after dancing, which turned to a spotted feavour. Sir George Ent was called in; he had all sorts of applications of blisters and laudanums. The apothecary's bill came to £28." "He was a good man and told me if I fell into a feavour again," says Sir George, "Sage possit would do me as much good as all the Physitians prescriptions."

According to "Physick lies a-bleeding; the Apothecary turned Doctor," printed in 1697, the ordinary physician's fee was ten shillings, and from the "Levamen Infirmi," published three years later, we learn that "to a graduate of physick his due is about ten shillings,

though he commonly expects or demands twenty! These that are only licensed physicians, their due is no more than six shillings and eight pence, though they commonly demand ten shillings. A surgeon's fee is twelve pence a mile, be his journey far or near; ten groats to set a bone broke or out of joint, and for letting blood one shilling; the cutting off or amputation of any limb is five pounds, but there is no settled price for the cure."

In " Physick lies a-bleeding," the physician is extolled as a man of learning and integrity at the expense of the apothecary, who is represented in the following dialogue as an extortionate leech.

" *Gallipot.*—Good Sir, be not so unreasonably passionate and I'll tell you, Sir, the Pearl Julep will be six shillings and eightpence, Pearls being dear since our clipt money was bought. The Specific Bolus four and sixpence, I never reckon less; my Master in Leadenhall Street never set down less be it what it would. The Anti-hysterick Application three and sixpence (a common one is but two and sixpence) and the Anodyne Draught three and fourpence—that's all Sir, a small matter, and please, Sir, for your lady. My fee is what you please, Sir. All the bill is but eighteen shillings.

" *Trueman.*—Faith then, d'ye make a but at it? I do suppose, to be very genteel, I must give you a crown?

" *Gallipot.*—If your worship please; I take it to be a fair and honest bill.

" *Trueman.*—Do you indeed? But I wish you had called a Doctor, perhaps he would have advised her to have forebore taking anything, as yet at least, so I had saved thirteen shillings in my pocket."

Although the fee for a licentiate is said to have been six and eightpence, it is evident that the needy physician would often take even a smaller fee.

Another writer of the period represents the poorer physicians as being little more than the slaves of the opulent apothecaries, "accepting half their right fee and taking instead, twenty-five or fifty per cent. of the amount paid for drugs to the apothecary. They (the apothecaries) offered the physicians five shillings and ten shillings in the pound, to excite their industry to prescribe the larger abundance to all the disorders."

While the physician only got his bare fee the apothecary got huge profits from the charges he made for his medicines and any fee he could get besides.

The physicians of eminence, however, received a much higher remuneration than their humbler colleagues, as evidenced from the large fortunes many of them acquired.

The story is told of Sir Theodore Mayerne, that one day a friend, after consulting him, placed two broad gold pieces on the table, which the doctor to his dismay pocketed.

The patient, who, as a friend, fully expected to have the fee refused, visibly showed his amazement and annoyance, which the doctor noted.

"Sir," said Sir Theodore to the disgruntled patient, "I made my will this morning; and if it should appear that I refused a fee, I might be deemed non compos."

Dr. John Radcliffe's fees are said to have amounted to at least £4,000 a year, and his successor, Sir Richard Mead, is said to have made from £5,000 to £6,000 per annum from his practice and died a very wealthy man.

Mead's usual fee to patients whom he saw at his house was a guinea, but for visiting persons of rank and position he expected two guineas or more. To apothecaries who waited on him at the coffee-houses, a common practice at the time, he charged half a guinea for a prescription, which he would sometimes write without seeing the patient. In the forenoons he received the apothecaries at Tom's near Covent Garden, and in the evenings he was generally to be found at Batson's.

The following story is related concerning an agreement a needy artist once made with his physician :

" An adept in the sister arts
Painter, Poet and Musician,
Employ'd a doctor of all parts,
Druggist, surgeon and physician.

The artist with M.D. agrees
If he'd attend him when he grew sick,
Fully to liquidate his fees
With painting, poetry and music.

The Druggist, Surgeon and Physician
So often physick'd, bled, prescribed,
That painter, poet and musician
(Alas, poor artist !) sunk—and died.

But ere death's stroke, ' Doctor,' cried he,
' In honour of your skill and charge,
Accept from my professions three—
A hatchment, epitaph and dirge.' "

CHAPTER XVII

DOCTRINE OF SIGNATURES—CURIOUS DRUGS EMPLOYED BY THE APOTHECARIES—MAN AS MEDICINE

THERE is little doubt that we owe the inclusion of much that is curious in the materia medica of the apothecaries of the seventeenth century to the doctrine of signatures or similitudes, which influenced to a large extent the selection of drugs employed in medicine in early times. The belief that the Creator, in providing remedies for the relief of disease, in many cases stamped on them an indication of their virtues, was universal and goes back to an early period.

Their usefulness was shown either by their shape, form or colour, which may be illustrated by a few instances from the vegetable kingdom. Thus, birthwort, on account of the shape of its corolla, came to be employed in cases of difficult parturition; red sandalwood and rose leaves were used in disorders of the blood; saffron and rhubarb were given in liver troubles; blood-root or tormentilla for the flux, and bladder-wort, on account of the shape of its calyx, was employed as a remedy for urinary diseases.

Of the substances derived from animals, foxes' lungs were administered in pulmonary complaints, and the liver of a wolf was given in cases of jaundice and other disorders of the liver.

The metals were credited with medicinal properties corresponding to the deities or planetary bodies with which they were associated. Thus, gold, being the metal ruled by the sun, was accounted a great cordial and restorative; and iron, associated with the planet Mars, was believed to possess the property of increasing physical strength.

The same idea prevailed concerning the parts and organs of the human body employed as remedial agents. Preparations of the skull were given for epilepsy, the brain in mental disturbances and the salt of urine to dissolve stone in the bladder.

"The Creator," says Charas, "has given to man a peculiar knowledge of many medicines contained in his own body in his lifetime, and in the bodies of other men after their deaths, far superior to those that are comprehended in the bodies of any other creature whatsoever; so that chemistry need not want work while busied in those copious preparations, which include not only the skull and other bones of men, the blood, the fat, the flesh and mummy, which is the body embalmed and dried, but also the nails, the hair, the urine and other excrements, even to the secundines of women; so that it may be said, there is not any part, no superfluity in man or woman, which chemistry cannot prepare for the cure and ease of the most diseases and pains to which both are subject."

The fundamental idea underlying the belief in the remedial virtues of these substances was, that the principal parts and organs of the human body were furnished with a volatile salt which, when separated out by distillation, possessed medicinal properties capable of healing many diseases to which man was liable.

Thus, the skull was rarely used in its crude condition but was first subject to distillation.

This was carried out as follows :—broken pieces or filings of skull were placed with sufficient spirit of wine and sage and digested for about twenty days in a retort. It was then distilled, the residue being again digested with more spirit for another fifteen days and again distilled. The liquids were then cohobated thrice, which meant mixing the distillates after each operation. After seven days the spirit was partly driven off over a Balneo Mariæ, and the concentrated essence thus obtained was ready for use. From two to twenty drops of this spirit were given in the treatment of epilepsy.

King Charles II, whose interest in chemistry is well known, was accustomed to amuse himself by preparing a tincture or spirit of skull in his private laboratory at Whitehall.

He is said to have purchased the secret of its preparation from Dr. Goddard for a sum of £1,500. Gutta Goddardiana, Arcanum Goddardianum, or Goddard's Drops, were introduced during the time of the Commonwealth and their inventor afterwards became professor of physic at Gresham College. Munk says, "he was a good practical chemist and his 'Drops' were commended by Sydenham." They were afterwards known as the "King's Drops" or the "English Drops," and had a wide reputation.

Dr. Martin Lister, when in Paris in 1698, was summoned by the Prince de Conti to see his son, and was requested to bring with him some of "King Charles' Drops," which were believed to be a specific in epilepsy. The formula published in Bates' Dis-

pensatory was as follows :—" Take of Opium, cut small, ½ lb. Put in a matrass and pour on Spirit of Wine to the height of four fingers. Stop the vessel and digest three days in a moderate heat, then distil in an alembic and you will have a clear spirit. Of this and Spirit of Human skull mix equal parts."

It is a curious fact, that one of the last remedies to be administered to the " Merry Monarch " in his fatal illness was Spirit of Skull. Thirty drops were given for convulsive fits, epilepsy, vapours and pains in the head, and it was also believed to possess powerful stimulating properties.

The formula originated by Paracelsus, which he called " Confectio Anti-Epileptica," contained three human skulls " taken from men who had died a violent death and had not been buried." These were to be dried in the air, reduced to a coarse powder and gradually heated in a retort. After being distilled three times, eight ounces of the distillate were to be mixed with three drachms each of musk, castoreum and honey and again distilled. To the resulting liquor, four scruples of liquor of pearls and one scruple of oil of vitriol were to be added, and of this, one spoonful was recommended to be taken in the morning, fasting, by those suffering from epilepsy. Berlu observes, that " the skull of a man ought to be such as one which dieth of a violent death, as in war or criminal execution, and never buried."

" The English druggists," says Pomet, " especially those in London, sell skulls of the dead upon which there is a little greenish moss called usnea, because of its near resemblance to the moss which grows on the oak. These skulls mostly come from Ireland, where they

frequently let the bodies of criminals hang on the gibbet till they fall to pieces." Berlu also confirms this, and states, that "the skulls from Ireland are best esteemed, being very clean and white and often covered with moss, which possesses great astringent properties, and when applied to a wound will stop hæmorrhage."

Usnea was exported to Germany, where there was a considerable demand for it for making the Sympathetic Ointments and Powders then in vogue, in which it formed one of the chief ingredients.

Human skulls are quoted in a price list of drugs printed in London in 1685 at 8*s*., 9*s*., 10*s*. and 11*s*. each, and, like other human bones, were sometimes calcined and administered in powder for dysentery, the marrow and oil extracted from the bones being used for rheumatism.

"Though the body of man," says Charas, "be the remote object of pharmacy, it ceases not, however, to be some of its subject, in regard it affords parts which are in truth medicaments, as the blood, the brains, the fat, the hair and other parts which a student in pharmacy ought to consider and understand how to prepare."

Human blood has been used for medicinal purposes from times of antiquity. The Romans believed the blood of gladiators to be a cure for epilepsy, and Celsus referring to it states, "some persons have been freed from this disease by drinking hot blood taken from a gladiator who had just been slain." It continued in use as a remedial agent throughout the Middle Ages, and was administered fresh, to prevent convulsive attacks, or when dried and powdered was employed as a styptic to stop hæmorrhage.

"Blood is Nature's treasury," says Renodæus, "and that of man is the best. The blood of a diseased or intemperate man must not be collected and kept in the shops, but only that from sound and temperate men."

It appears probable that the principle underlying the tradition, that the parts of the human body used in medicine must be taken from a person who has not died from disease, but who had died a violent death, was founded on the belief that the disease that had proved fatal to the individual would also affect his body.

"All writers," states Charas, "extol the volatile salt of man's blood for the cure of epilepsy. It is also effectual in dropsy, in gout and as a scorbutick to help eruptions of the skin."

In connection with this latter property it is interesting to note, that fresh blood taken from the patient and injected subcutaneously has recently been recommended by French dermatologists in the treatment of acute cases of dermatitis and eczema.

During the Middle Ages menstrual blood was also employed. Paracelsus called it the "maid's zenith" and recommended it as an application for gout. It was also believed to be a cure for hydrophobia. Ettmuller says, "it should first be mixed with crow's fat," and held it was a good application for abscesses and carbuncles. Another method of using it for this purpose was to sprinkle some on a piece of linen and then soak it in vinegar and rose-water and apply it to the affected part.

Spiritus Antepilepticus Sanguinis Humani, which consisted of the liquid distilled from human blood mixed with angelica water and tincture of peony flowers, was

highly esteemed as a remedy for asthma, palsy, apoplexy and falling sickness.

The human brain was employed as a medicinal agent by the ancient Egyptians over 4,000 years ago, as instanced in a recipe for the eyes recorded in the Papyrus Ebers.

It reads: "Take the brain of a man and divide it into two parts. Mix one part with honey, and with it anoint the eyes each evening. The other half dry and powder finely, and with it anoint the eyes in the morning."

The brain was also employed in the form of a spirit and an oil, the latter preparation being made by digesting it with gentle heat in the medium and the former by distillation.

The Spirit of the Brain of Man, or "Golden Water," was prepared as follows:

"Take the Brain of a young man under 24 that died violently, with all its membranes, arteries, veins and nerves. Beat it and add cephalick waters as of Tile flowers, Peony, Betony, with black cherries, lavender, lily. Let them stand awhile, then distil by cohobation and make a salt from the residue and join it to the spirit. It is a brave anteleptick given from a scruple to four scruples for a dose."

Urine, as might be expected on account of its colour, was employed internally in cases of jaundice and dropsy, and was also believed to cause easy delivery, if taken by women in labour. Externally, it was used to cleanse wounds, and boy's urine dropped into the ears was said to relieve soreness. Other preparations of urine were the spirit, taken for stone, gout and asthma, the volatile

salt, and the magistery, which was said to possess anodyne and sudorific properties. To prevent the formation of calculi, the latter was given in doses of 10 grains, and taken once a month "before the new moon" it was said "to cure consumption wonderfully." An oil prepared by taking the gritty and tartarous matter collected from urine, calcined, dissolved, coagulated, and then re-dissolved, was administered for stone, in doses of 20 grains, and was declared to "perfectly dissolve the same." With reference to its reputed anodyne property, Madame de Sévigné, writing to her daughter on June 13th, 1685, remarks, "for my vapours I take eight drops of essence of urine, and contrary to its usual action it has prevented me from sleeping."

"The fat of man," says Berlu, "gathered from those parts as suet is made from other creatures," was another gruesome substance stocked by the apothecary.

Pomet observes, "Everybody knows in Paris, the public executioner sells it; the druggists and apothecaries, a little; nevertheless they vend a sort of it, prepared with aromatic herbs, and which is without comparison much better than comes from the hangman."

It was highly esteemed as an embrocation for rheumatism and pains in the joints.

A liquor distilled from human hair mixed with honey is recommended by Lovell as a "stimulating application for a bald head," and when finely chopped up it was given internally for jaundice. Burning hair has been employed as a restorative in fainting attacks from an early period, and it is easy to understand why nail-parings from the fingers and toes were recommended by several writers to be administered in wine as an emetic.

A cure for consumption by magical aid was carried out by taking portions of the hair and nails of the sick person, and after cutting them up small, they were to be placed in a hole in the root of a cherry tree. If this did not prove effectual, they were to be mixed with wax and attached to a live crab and cast into the sea.

Wax removed from the ears was recommended as an application for whitlows, while human milk was used to bathe inflamed eyes and given in cases of consumption. The use of human milk in ophthalmia goes back to a period of great antiquity and is mentioned in several recipes in the Papyrus Ebers, while the early Hindus and the Arabs frequently employed it as a domestic remedy for eye troubles; cow's milk has taken its place to-day. Human skin was employed as a girdle to aid parturition, and strips tied round the legs below the knees were used to prevent cramp.

The gall, not only of man but of animals and birds, has long been employed in the treatment of eye ailments. Pliny states, that Marcellus used human gall in the treatment of cataract, and the Anglo-Saxons believed that ox-gall diluted with water cleared the sight. The Chinese still use it for this purpose.

An extract made with a spirit from human gall was recommended to be dropped into the ear for deafness, and it doubtless acted as an excellent solvent for hard wax.

The human heart, after being dried and powdered, was sometimes administered in the treatment of epilepsy.

Another curious preparation for the same disease which was originated by Sir Theodore Mayerne, who was considered one of the most enlightened men of his

time, consisted of human skull, crude and vitriolated, secundine of a woman, amber, hartshorn, ambergris, gold, silver and several roots, seeds and flowers, powdered and mixed together.

The use of saliva as a medicinal agent is mentioned in the Bible and also in the Talmud. In the latter it is stated that while the saliva of a new-born man-child has remedial properties, that of a female is useless.

The Romans believed that Imperial saliva had special curative virtues, and Pliny states, that ophthalmia may be cured by the application of the spittle of a woman every morning.

It was frequently recommended by the early Arab physicians. Rhazi states, that the dropping of saliva into the eye after an operation is helpful, while Avicenna, referring to the cure of "white specks" in the eye, advises that it should first be bathed with cold water and afterwards saliva should be applied.

The chief use of saliva, however, was as an antidote for the bites of venomous snakes and mad dogs, a tradition that probably had its origin in the sucking of a venomous bite, which may be said to have been the earliest form of "first aid." Saliva was also believed to have a magical effect in removing warts, a belief which has survived to the present day.

Human sweat when mixed with mullein was administered as a cure for scrofula, and the secundine or navel, was used to relieve swelling of the throat.

Besides the organs and other parts of the human body already mentioned, mummified remains of the human body were also extensively employed in medicine from the twelfth to the seventeenth century, and mummy is

still sold in the drug-bazaars as a remedial agent in the Near East.

The name of the individual who first introduced mummy into medicine has not been handed down to posterity, but its use in the treatment of paralysis, skin eruptions, abscesses and disorders of the liver and spleen, is mentioned by Avicenna, who flourished between 980 and 1037 A.D.

The medicinal properties of mummy are supposed to have been based on the remedial virtues of the natural bitumen, said to have been obtained from the Dead Sea, which was employed in embalming. It is, however, denied by some recent writers that bitumen was employed in the process of embalming by the ancient Egyptians.

There is no doubt, however, that human remains other than Egyptian mummies, came to be used in medicine as the supply of the latter became scarce.

"Of the mummies employed in medicine," says Pomet, "five kinds were known, viz.:

"1. The true Egyptian.

"2. Factitious, or those in which bitumen and pitch were used in the process of embalming.

"3. The Arabian. Bodies embalmed with myrrh, aloes and other aromatic gums.

"4. Bodies dried in the sun in the country of the Hammonians, between Cyrene and Alexandria, being mostly the bodies of passengers buried in the quicksands.

"5. Artificial mummies."

Crollius gives the following process for making artificial mummy:

"Take the carcass of a young man (some say red-haired), not dying of disease but killed, and let it lie

24 hours in clear water in the air. Cut the flesh in pieces, to which add powder of myrrh, and a little aloes. Imbibe it 24 hours in spirit of wine and turpentine, then take it out and hang it up for 12 hours. Afterwards imbibe it again 24 hours in fresh spirit, then hang up the pieces in a dry air and shady place."

Guy de la Fontaine, physician to the King of Navarre, who made a journey to Egypt in 1564 to investigate the source of the supply of mummy, states, that while in Alexandria he visited a Jew, who showed him his stock consisting of about forty mummies, which he owned that he had himself prepared in four years. He admitted having collected the bodies of slaves and other persons which he opened and filled with bitumen. He then bandaged them and dried them in the sun until they assumed the appearance of true Egyptian mummies. Owing to the great demand for mummies, the trade in these substitutes continued to be carried on.

Thus Pomet, writing a century later, says, "We may daily see the Jews carrying on their rogueries as to these mummies, and after them the Christians, for the mummies that were brought from Alexandria, Venice and Lyons are nothing else but the bodies of people that die several ways.

"Those from Africa, called white mummies, are nothing else but bodies that have been drowned at sea, which, being cast upon the African coast, are buried and dried in the sands, which are very hot.

"I am not able to stop the abuses committed by those who use this commodity. I shall only advise such as buy, to choose what is of a fine shining black, not full of bones and dirt, of good smell, and which being burnt does not stink of pitch. Such is proper for contusions and to hinder blood from coagulating in the body."

Nicholas Lemery, in referring to mummy at the end of the seventeenth century, states, that although originally mummies were brought from Egypt, other sources were being drawn upon and bodies buried in the sands of Lybia were in demand. So it must be concluded, that the mummy used in medicine was of uncertain quality and subject to considerable adulteration.

The chief preparations of mummy in the pharmacopœias of the time, were a tincture, a treacle, an elixir and a balsam. The latter was prepared by mixing and digesting for a month, half a pound of the tincture with Venice treacle 4 ounces, Salt of Pearl 2 drachms, Coral 2 drachms, Terra Sigillata 2 ounces and Musk 1 drachm.

This mixture was said to have such a " piercing quality that it pierceth all parts, restores wasted limbs, hecticks, and cures all ulcers and corruptions."

Mummy was administered in the form of powder or bolus in doses of two drachms for epilepsy, vertigo and palsy, and was also applied externally to wounds to prevent mortification. It is quoted in a price list of drugs in 1685 at 5*s*. 4*d*. a pound.

Sir Thomas Brown remarks in his " Hydriotaphia," " The Egyptian mummies which Cambyses or time hath spared, avarice now consumeth. Mummy is become merchandise. Mizraim cures wounds and Pharaoh is sold for balsams." And so the Jew eventually had his revenge on his ancient oppressors.

Human calculi, or stones taken from the bladder, were reputed to possess the property of dissolving other stones, when powdered and taken internally, in doses from 5 to 15 grains. Sixty grains are recommended to be given to remove obstructions in the bowels. Calculi

from bulls, when powdered, were also used as an astringent and administered internally for epilepsy.

The liquid expressed from the testicles of horses when crushed was esteemed as a tonic and invigorator.

One of the most important and valuable drugs stocked by the apothecaries was the Bezoar stone, famed in most countries of the world from the fourteenth to the eighteenth century as an antidote to all poisons. These curious stones were calculi found in the intestines of Persian wild goats, cows, a species of ape and other animals. They vary in size from that of a small egg to a hazel nut, and also in colour, from a yellowish-white or brown to a greenish-grey.

They are first mentioned for their medicinal properties by Avenzoar, the Arab physician of Seville about 1140, but it is probable that they were used in the East long before that time.

There were several varieties kept by the apothecaries in the seventeenth century, the chief being the Oriental, the Occidental and the Factitious. Of these, the Oriental brought from Persia were the most highly valued, and were sometimes sold for ten times their weight in gold.

On dividing the calculus, it appears to have been formed by a deposit of calcium phosphate around a nucleus consisting of hair or a fruit-stone. A Bezoar stone preserved at St. Bartholomew's Hospital has a date-stone as the nucleus. It was believed that the special virtues of the stone were due to some unknown plant on which the animal of its origin had fed.

The Occidental stones were much larger in size and are said to have been obtained from the llamas of Peru. They have a rough surface and are usually of a greyish-

brown colour, but they were not considered as valuable as the Oriental variety.

There were also Bezoars obtained from the monkey (*Simiæ*) brought from Brazil, which were of a dark green colour and much smaller, while the Indian porcupine furnished another variety, which were of a pale purple colour. Bezoar stones were also obtained from the chamois of Switzerland and the Tyrol, and artificial stones were often sold or substituted for this costly drug.

All the varieties of Bezoar were reputed to possess the property of counteracting the effects of poison, and scrapings of the stone were taken internally for fainting attacks, heart weakness, palpitation, colic, jaundice, fevers and plague, in doses of from 4 to 16 grains.

During an epidemic of plague in Portugal in the seventeenth century, Bezoar stones were lent to sufferers at about the equivalent of ten shillings a day.

Bezoar stones were considered as gifts fit for Royalty, and three specimens were presented by the Shah of Persia to the Emperor Napoleon a little over a century ago.

Goa stones were entirely artificial bodies, which were made by the Jesuit missionary fathers who settled at Goa in the East Indies in the seventeenth century, from the sale of which they derived a considerable revenue. They are said to have been composed largely of the following precious stones: ruby, sapphire, hyacinth, topaz, emeralds and pearls, mixed together with Oriental bezoar, white and red coral, musk, ambergris and gold leaf. All the ingredients were first reduced to a very fine powder, and after being made into a paste with rose-water were rolled into balls about the size of a billiard ball.

They were often carried in beautifully wrought gold or silver cases pierced with small holes, so that their powerful perfume could be inhaled to prevent infection from disease. For internal use, a few grains were scraped off and taken in wine as an antidote to poison and to counteract the effects of venomous bites. Goa stones commanded a very high price owing to the costly nature of the ingredients.

Of equal esteem as an alexipharmic was the horn of the unicorn, which has been associated with medicine for at least four centuries before the Christian era. Until about the sixteenth century, its source of origin was regarded as a mystery, but about that period it is mentioned by writers as being derived from the tusk of the narwhal brought from the East.

Many traditions cluster round its history, and Ambroise Paré, the famous French surgeon, wrote a treatise on its properties in the sixteenth century. It was regarded as a most valuable antidote to all poisons, and drinking-cups were fashioned from the horn which were believed to be capable of absorbing the poison of any liquid placed in them.

Large horns were worth their weight in gold, and one presented to the King of France in 1553 was valued at 20,000 livres. Another, said to have been seven feet long and believed to be the largest in the world, was presented to King Charles I. Scrapings of the horn were given in wine for plague and fevers, and a jelly was also made from it, which was believed to possess powerful invigorating properties.

In 1596, Sir Henry Winton, who was sent as ambassador by Queen Elizabeth to King Henry IV of France,

met with an accident while on his mission. According to a record of the time, "he was physicked with Confectio Alcarmas, which was composed of unicorn's horn, musk, amber, gold and pearls, and with pidgeons applied to his side and all other means that art could devise, sufficient to expell the strongest poison and he be not bewitcht withall."

Another horn to which similar virtues were attributed was that of the rhinoceros. From an unknown period of antiquity the Chinese have believed in its power to indicate the presence of poison. They regarded the horns as of great value, and when making them into drinking-cups often decorated them with beautiful carvings. The horn was supposed to act not so much as an antidote, as an absorbent of any poison that might have been placed in it, and also indicated its presence by sweating or changing colour.

The horn itself was also said to possess valuable medicinal properties and was given internally in doses of from 10 to 20 grains, in cases of malignant fevers and other diseases. The importance attached to it as a remedial agent is indicated by the choice of the rhinoceros as a crest by the Society of Apothecaries on obtaining its grant of arms.

The horns of the elk were employed as an astringent, and the hoofs were regarded as being efficacious in the treatment of epilepsy and "hysteriac passions." Rings made from the horn and worn on the finger were believed to protect the wearer from convulsive fits.

Various curious bones which formed part of the materia medica of the apothecary were probably relics of an earlier age of folk medicine, when almost any strange

substance of mysterious origin was credited with peculiar medicinal virtues.

Among them were Lapis Dentalis, little bones taken from the heads of large whiting or haddocks, which derived their name from their tooth-like margins. Dried and powdered they were taken to relieve indigestion. Lapis Manateæ, a hard white bone from a fish called Manatea, came from the West Indies and was said to possess similar properties. Os de Corde Cervi, or the bone of a stag's heart, which hunters call the hart's cross on account of its shape, was also administered in powder for heart troubles.

Wolves' teeth, when powdered, were considered valuable in the treatment of pleurisy or were rubbed on the gums of infants to assist teething. Boars' teeth reduced to powder were also used for pleurisy and quinsies, and the hoof of the ass was reputed to be useful in the treatment of epilepsy.

The fat or grease of the bear has for centuries been esteemed for promoting the growth of the hair, and the gall of the animal was employed in the treatment of asthma.

Vipers, which early writers on medicine declare are to be preferred above all other serpents for their remedial virtues, were chiefly used as ingredients in the various treacles used as antidotes to poison and in the treatment of plague. The celebrated "Viper lozenges of Venice" were renowned throughout Europe as a preventive of plague and as antidotes to poison.

When being prepared, the heads and tails of the vipers were cut off and rejected, and the flesh and fat only were employed after being carefully washed in water.

The fat from which a broth was made was said to be of special value for leprosy.

Scorpions were employed as medicinal agents in the form of an oil, which was made by infusing dead scorpions in olive oil with gentle heat. This preparation was used as an embrocation for rheumatism and applied to the groin in cases of plague.

Lizards were applied to the bites of scorpions in the belief that they would counteract the effect of the venom, and they were also used in cases of rupture in children.

The skink, a similar small reptile, was believed to possess alexipharmic properties and formed an ingredient in the Treacle of Andromachus. It was given alone in powder, dissolved in wine, in doses of one drachm.

Frogs, cut up, dried and reduced to powder, were used to stop hæmorrhage from wounds and from the nose. They were also given in cases of gonorrhœa and applied to the scalp to make the hair grow.

A distilled Water of Frogs, according to Charas, was highly esteemed by the ladies of France for beautifying the skin and preserving the complexion. The flesh of the peacock, cut up and distilled, was said to yield a crystalline volatile salt and a clear oil of great value, especially in the treatment of epilepsy, while the fat of the bird was recommended to relieve colic.

Millepedes or woodlice were formerly held in great esteem and were official in both the London and Edinburgh Pharmacopœias as well as in most of the pharmacopœias of Europe. This insect, found in cellars and under stones in cold, moist places, has fourteen legs and rolls itself up into a ball on being touched.

Two species were employed: a large one of a dusky bluish-black colour, and a smaller variety, flat and thin, of a pale brownish tint with a forked tail.

They were esteemed for their resolvent, aperient and diuretic properties, and employed in the treatment of jaundice, asthma and scrofula in doses of about fifty at a time, or two hundred a day. They were usually swallowed whole, but were sometimes sold in the shops in the form of powder. The Edinburgh Pharmacopœia contained a formula for a wine of millepedes, made by digesting two ounces of live millepedes, slightly bruised, in a pint of Rhenish wine for a night, then pressing and straining the liquid. Among other preparations of this insect were a conserve made with sugar, a broth, an infusion, a tincture and a syrup; the latter also contained liquorice and pellitory roots, raisins, borage and bugloss.

Pierquin's "Diuretic Liquor," a remedy largely used in the eighteenth century, was made by macerating millepedes and juniper berries in white wine.

Hog's lice were employed in the treatment of stone, and were one of the remedies prescribed for King William III by Dr. Bidloo on June 26th, 1700, who ordered his Royal patient to take "Twenty drops of Tincture of Salt Tartar and the juice of thirty hog-lice at six o'clock."

Both red and white coral held an important place in the materia medica of the seventeenth century. In many of the old recipes the red is called the male, and the pale or white, the female. It was believed to strengthen the heart, to comfort the stomach, cleanse the liver and give relief in malignant fevers. It was said to prevent epilepsy in children, and when worn as an amulet,

" banished fear and prevented fright and cured melancholy."

Crab's eyes, which were official in the London and Edinburgh Pharmacopœias, were not obtained from crabs as the name implies, but were small concretions found in the heads of crayfish. They are about the size of a pea, round in shape and slightly flattened on one side. They were chiefly brought from Holland and Russia, and were highly esteemed for their absorbent qualities and taken to correct acidity. Hoffmann recommends them to be dissolved in vinegar before being taken.

The black tips of crab's claws when crushed were " largely used in making the compound absorbent powders of the shops," says Lewis, and in the London Pharmacopœia, the compound powder of crab's claws was made by mixing them with one part of coral with one part of pearl.

One of the most popular remedies of the late seventeenth century in which crab's claws formed an important ingredient was the " Countess of Kent's Powder," the formula for which was as follows :

" Take the black extremities of the feet of large sea crabs 4 ounces,
River Crab's eyes,
Eastern Pearls,
Red Coral, of each 1 ounce.
White Amber,
Root of Contrayerva,
Vipers, of each 6 drachms.
Bezoar Stone, 3 drachms.
Stag's heart bone, 4 scruples.
Saffron, 2 scruples.

"Finely powder, sprinkle with 1½ ounces of Spirit of Honey and mix with jelly of Vipers. Make into lozenges and dry in the shade. To be powdered when used."

"This powder," says Schroeder in 1669, "is very famous and in high request in England against epidemic distempers, particularly against small-pox and measles. It is also highly commended for plague, for it strengthens the heart and all noble parts. Nor is it less esteemed in France by persons that know the virtue of it."

Another curious preparation used as an embrocation for shrunken limbs, the formula for which is first given by Maister Alexis in 1562, was called the "Oil of Red Dog."

The process for making it was as follows:

"To make oile of redde dogge, by the means whereof (beside other infinite vertues that it hathe) I have healed a Fryer of Saint Onostres, who had by the space of twelve years a lame dry withered arme, lyke I styche so that nature gave it no more nouryshement; Take a young dogge of redde heare and keep him three days without meate and then strangle him with a corde and let him lie dead a quarter of an houre; and in the meane time boyle a kettell of ayle up by the fire and putte the dogge in whole or in pieces, it maketh no matter howe, so that he be all there with the skynne and heare; make him seethe so untyl he be almost sodden to pieces, keepyng always the kettell close covered. In the meane tyme, take scorpions to the number of four score or a hundred, and put them in a basyn on the fire untyl they be thoroughly bruised. Then putte them in the sayde kettell with the ayle and the dogge, puttinge to it a great dishful of great grounde worms, well washed, a good handful of Sainte John's Worte, a handful of wylde

marshmallowes, and a handful of wallworte with an once of saffron. Seethe all these things well together and then let it ware colde. In the ende strayne the liquid."

Such were some of the curious remedies which were made and sold by the apothecaries and that formed part of the materia medica of the physician some three centuries ago.

CHAPTER XVIII

THE HISTORY AND LORE OF SOME FAMOUS DRUGS

THE early history and lore associated with some of the drugs that have proved in the course of centuries to be of incalculable value to mankind is a matter of great human interest. Some of these remedies were introduced by physicians, apothecaries and chemists, while others were originated by empirics and experimenters in medicine and chemistry.

Space will only permit of the mention of a few of the more important drugs that were introduced during the seventeenth and eighteenth centuries, the most noteworthy of which is perhaps cinchona, or as it was originally called, Peruvian bark.

Although much has been written concerning the early history of the drug, our knowledge of the precise date when its remedial properties were first discovered, and of the manner of that discovery, is largely traditional and is still enveloped in mystery.

A picturesque story is related by Geoffroy, of an Indian who, having lost himself in the dense forests of Peru, became stricken with fever and at length collapsed from exhaustion beside a little lake. He drank eagerly of the water, into which a cinchona tree had fallen, and awoke after a troubled sleep to find the fever had left him. There is, however, no foundation for this legend,

which does not appear to have been recorded until late in the eighteenth century.

The same may be said of the tradition related by La Condamine in 1738, that the febrifuge properties of the bark were discovered by the natives through watching the pumas chew it in order to cure their fevers.

As a matter of fact, the aborigines of South America, with the exception perhaps of the tribes in the neighbourhood of Loxa, appear to have been quite ignorant of the medicinal virtues of the bark.

Markham observes that it is also significant that the medicine bags or wallets carried by the native itinerant doctors, whose materia medica had been handed down from the time of the Incas, never contained cinchona.

Although Peru was discovered in 1513 and had submitted to the Spanish by 1550, no mention has been found of the bark earlier than the beginning of the seventeenth century.

Joseph de Jussieu, who visited Loxa in 1739, believed that the first knowledge of the properties of cinchona was derived by the Indians of Malacotas, some leagues south of Loxa, a town founded by the Spaniards in 1546. He states, that the use of the drug was first made known to a Jesuit missionary who, when suffering from an attack of intermittent fever, was cured by the bark, which was administered to him by an Indian chief at Malacotas in 1600, and La Condamine claims to have discovered a manuscript in the library of a convent at Loxa in which it is stated that the Europeans of the province used cinchona about the same time.

A similar story is related of Don Juan Lopez Canizares,

the Spanish Corregidor of Loxa, who is said to have been cured of fever by taking the bark in 1630.

The fact, however, that its local name was QUINA-QUINA, which means Bark of Barks, seems to indicate that some special value was attached to it.

It is somewhat remarkable that, although the Indians of Peru strongly adhere to their traditional customs, they made no use of cinchona medicinally and even, in more recent times, actually had a prejudice against it in many cases.

Poeppig, writing in 1830, says that the people of Huanuca, who frequently suffer from tertian agues, have a strong repugnance to its use; while Humboldt declares that, at Loxa, the natives would rather die than have recourse to what they consider so dangerous a remedy. Spruce makes a similar observation with regard to the people of Ecuador and Colombia, and says it was difficult to make the natives believe, that their red bark could be required for any purpose other than for dyeing cloth.

The first authenticated record of the therapeutic value of cinchona is in the year 1638, when the wife of Don Luis Geronimo Fernandez de Cabrera, Bobadilla y Mendoza, fourth Count of Chincon and Viceroy of Peru, was stricken with intermittent fever in the Palace of Lima. This lady's maiden name was Ana de Osorio, and she was a daughter of a noble family whose founder was created Marquis of Astorga by Henry IV, King of Castille. At the age of sixteen she was espoused to Don Luis de Velasco, a grandson of the first Marquis of Salinas, who died within four years of their marriage.

The young widow, who was a woman of great beauty,

THE COUNTESS OF CHINCON

WHO INTRODUCED PERUVIAN BARK INTO EUROPE IN 1640

From an alabaster effigy on her tomb

became lady-in-waiting to Queen Margaret, wife of Philip III, and while at Court she married for the second time. Her new husband was the Count of Chincon, who was Lord of the Castle of Chincon near Madrid and of eighteen towns in the Kingdom of Toledo.

The Count was appointed Viceroy of Peru in 1628, and with his Countess made solemn entry into Lima on January 14th, 1629.

When the news that the Countess was suffering from fever reached Don Francisco Lopez de Canizares, the Corregidor of Loxa (who had himself been cured of an attack by means of the drug), he at once despatched a packet of the powdered bark to Dr. Juan de Vega, physician to the Countess, assuring him of its efficacy in the treatment of "tertiana." Vega decided to give it to his patient, with the result that the Countess made a rapid and complete recovery.

According to a manuscript by Hippolito Ruiz, the particular species from which the bark administered to the Countess was taken, was that known to the bark collectors of the time as Cascarilla de Chahuarguera, which abounds in cinchonidine. Howard points out the interesting fact that it was therefore to this particular alkaloid that the Countess owed her cure.

After her recovery, the Countess became an enthusiastic advocate of the remedy and caused quantities of the bark to be collected, which she not only administered to her dependents, but also distributed to others suffering from fever. Thus it came to be called the "Countess' Powder."

Hanbury declares that the bark was certainly known in Spain in 1639, a year before the Countess returned to

Europe, as on that date it was administered for the first time to a priest at Alcala de Henares near Madrid.

The Countess came back to Spain in the spring of 1640 and brought with her a quantity of the bark, with the intention of distributing it among those suffering from fever on her husband's estate, where tertian was very common. When Dr. Juan de Vega followed her shortly afterwards, he brought with him a further supply, which it is said he sold at Seville for 100 reals a pound.

Little more is known of the bark until 1653, when Chifflet, physician to the Archduke Leopold of Austria and Governor of the Low Countries, wrote a report on the drug and its introduction into Europe. He says, " Among the wonders of the day, many reckon the tree growing in the Kingdom of Peru called Lignum Febrium, whose virtues chiefly reside in the bark which is known as China Febris.

" During the last few years it has been imported into Spain and thence sent to the Jesuit Cardinal Joannes de Lugo at Rome."

In 1652, Chifflet's master, the Archduke, had been taken ill with fever and was treated with the bark, but although he recovered from two attacks, he refused to take it in a subsequent one, to which he succumbed. The physicians of the time were divided in their opinions as to its value. Considerable controversy arose, and although it was admitted by many that it palliated the fever, they insisted that it " fixed the humour," thus causing a relapse or some other dangerous disease.

Roland Sturm, a doctor of Louvain, who wrote a treatise on the new febrifuge in 1659, states, that it was known in Brussels and Antwerp at that time as Pulvis

Jesuiticus, because the Jesuit Fathers used to administer it. They charged the rich the price of its weight in gold, but gave it to the poor who suffered from quartan fever. It was more commonly known as Pulvis Peruanus or Peruvianam Febrifugum.

The Fathers in Peru sent considerable supplies of the bark to Rome, and the methods of using it were explained to a Congress of Jesuits assembled in that city. It was afterwards distributed to members of the Community by Cardinal de Lugo, the Procurator-General of the Order, who also gave it away to the poor who came to his Palace. Thus it became commonly known in Rome as the "Cardinal's bark" or the "Powder of the Fathers."

Sturm states, that he "saw twenty doses sent to Paris in 1656 which cost 60 florins, and according to the directions issued to the apothecaries of Rome for its administration, it was to be given infused in white wine."

Cardinal de Lugo, on visiting Paris, found Louis XIV suffering from an attack of intermittent fever and persuaded him to take the bark, after which he made a good recovery.

But in spite of its success in such notable cases, its medicinal value still remained a subject of dispute. Chifflet at Paris in 1653, and Plempius of Rome in 1656, both predicted the disappearance of the bark as a therapeutic agent and denounced its use as harmful; on the other hand, Badius of Genoa in 1656 defended it and quoted 12,000 cures by its aid in Italy alone.

The high price it commanded caused many worthless substitutes to be sold, and the Spanish merchants were

charged with sending various other astringent barks into Italy, adulterated with aloes to give them a bitter taste.

The bark does not appear to have been known in England until about 1655, the first mention of it occurring in the "Mercurius Politicus," one of our earliest newspapers, in 1658, a year in which an epidemic of remittent fever raged in this country.

It is referred to as "The excellent powder known by the name of the Jesuit's Powder, brought over by James Thomson, a merchant of Antwerp." Brady, then Professor of Physic at Cambridge, was one of the first to prescribe it, and Willis observes it as coming into daily use, but its general introduction seems to have been largely due to Robert Talbor, who may be said to have made his name and fortune by exploiting it as a secret remedy.

Robert Talbor, or Talbot as he was sometimes called, had a remarkable and interesting career. He was born in 1642, and after leaving school, was apprenticed to Mr. Dear, an apothecary of Cambridge. Although entered as a sizar at St. John's College for five years, there is no evidence that he ever graduated.

About 1671 he settled in Essex to practise medicine, where he says, "I planted myself near the seaside where agues are the epidemical diseases." In the following year he published a little book called "Pyretologia, a rational account of the cause and cure of Agues," in which he makes reference to his secret remedy for the fever, and states that it consisted of four ingredients, "two indigenous and two exotic." He alludes to Peruvian bark as follows :—"Let me advise the world to beware of palliative cures and especially of that known

as Jesuit's Powder, as it is given by unskilful hands. Yet this powder is not altogether to be condemned, for it is a noble and safe medicine, and if rightly prepared and corrected, and administered by a skilful hand, otherwise as pernicious a medicine as can be taken."

Talbor's reputation soon increased and he removed to London, where he set up his sign next door to Gray's Inn Gate in Holborn.

The results of his treatment brought him rapid success, and after having cured the daughter of Lady Mordaunt of an attack of fever, he was summoned to Windsor to see King Charles II, who had been seized with the same complaint.

He was fortunate in being able to restore the King to health, and so secured the Royal favour. Talbor was not a Licentiate of the College of Physicians and had no qualification to practise, so, to save him from attacks from that quarter, the King caused a letter to be written to the College, restraining that body from interfering with him in his practice in London.

On July 27th, 1672, he was appointed Physician to the King, and later on received the honour of knighthood at Whitehall. Under a patent issued under the Privy Seal dated August 7th, 1678, Sir Robert Talbor was granted an annuity of £100, together with the profits and privileges appertaining to a Physician-in-Ordinary to the sovereign.

Evelyn, in his Diary on August 29th, 1679, states, that " he had conversed with the Marquis of Normanby concerning the Quinquina, which the physicians would not give the King (out of envy, because it had been brought into vogue by Mr. Talbor, an Apothecary) at

a time when he was in a dangerous ague. It was the only thing that could cure him. Mr. Short, to whom the King sent to know his opinion of it, privately sent word to the King, that it was the only thing that could save his life, and then the King enjoined the physicians to give it to him, which they did, and he recovered."

From this it would appear that the active ingredient in Talbor's remedy was more than suspected at that time.

In 1679, Talbor visited Spain, and on his return through France, stayed for some time in Paris, where he soon became a prominent personage. Madame de Sévigné alludes to him several times in her "Letters" and remarks, "Nothing is talked of here but the Englishman and his cures." In November 1680, when the Dauphin was seized with an attack of fever, Talbor, who had made influential friends at the French Court, was called in and undertook to treat him. Madame de Sévigné says, "The King, Louis XIV, insisted on Talbor preparing his wine in his presence before giving it to the Prince."

The treatment was eminently successful and the Dauphin soon recovered. Talbor was made a Chevalier, but the King, determined to learn his secret, eventually induced him, for a sum of 2,000 louis d'or and an annuity of 2,000 livres, to reveal his method of treatment and the formulæ for his remedy, which, however, was not to be published until after his death.

After a further visit to Spain, where he cured the Queen of an attack of fever, Talbor returned to London, where he died shortly afterwards in 1681, at the early age of forty. He was buried in Trinity Church, Cambridge.

The formula for his remedy was published in England

in 1682 under the title, "The English Remedy, or Talbor's wonderful Secret for cureing of Agues and Feavers."

According to this book he used several preparations of the bark. The first consisted of a strong infusion of the bark with a decoction of aniseed and juice of parsley to which, after a day or two, as much claret wine was to be added. This was allowed to stand for eight days and the liquid strained off. He then made an infusion from the residue of the first one, with equal parts of fresh bark in powder. This was again macerated with more claret for ten days and, after being strained, formed the wine he generally administered.

He also used a tincture, which he made by macerating two ounces of Peruvian bark in eight ounces of spirit of wine for fifteen days.

It is interesting to note that this preparation is practically the same strength as the tincture of cinchona of the British Pharmacopœia to-day. To this he would sometimes add red roses, lemon juice, fennel-root juice, smallage leaves or parsley, and when he thought necessary a small quantity of tincture of opium.

These were the preparations of cinchona, all excellent of their kind, by means of which Talbor became famous throughout Europe.

During the last illness of Charles II, the bark was again administered to him twice. According to the record, on February 5th, 1684, "His physicians hearing that a species of intermittent fever was raging all over the city, which commenced with severe convulsions but which was speedily cured by the use of Peruvian bark at intervals, they all agreed to administer it to the King, and draughts

were prepared of the bark in powder with Syrup of Cloves, and given in small doses throughout the day."

There is an interesting bill dated 1675 in the British Museum, in which Dr. Charles Goodal offers to sell at the " Coach and Horses " in the Physicians' College in Warwick Lane, " a superfine sort of Jesuit's bark, ready powdered and papered into doses, at 4*s*. per ounce or £3 per pound, and for the excellency and efficacy of this particular Bark, enquire of Dr. Morton in Grey Fryers."

The same price for Jesuit's bark is quoted by Gideon Harvey in a list of drugs dated 1678.

" When in the hands of the Jesuits," says the author of the " English Remedy," " it was sold in Rome for 8 or 9*s*. the dose, which consisted of two drachms. Three or four years ago, the best might be had for 40*s*. the pound. Sir R. Talbor observing that Febrifuges were prepared which came very near his own, and fearing that least somebody at length might discover it, resolved to buy up all the Quinquina that he could find in Paris, and the chief towns of England and France," a wise proceeding on his part.

About 1675, Peruvian bark became accepted into the domain of regular medicine, and in 1677 it first appeared officially in the London Pharmacopœia under the name of Cortex Peruanus.

With reference to the preparations of the drug, mention should be made of Dr. John Huxham, who was the originator of the well-known Compound Tincture of Cinchona, the formula for which he published in his " Essay on Fevers " in 1755, and which was first included in the London Pharmacopœia of 1788.

We are indebted to the French for the early botanical studies on cinchona. The first attempt to transport any plants to Europe was made by La Condamine in 1743. He was assisted in his pioneer investigations in Peru by Joseph de Jussieu, who after fifteen years of laborious work was robbed of his valuable collection of plants; a circumstance which so affected him that he lost his reason.

In 1742, Linnæus established the genus cinchona and, in 1753, first described the species Cinchona officinalis, which he so named in honour of the Countess of Chincon.

The reckless manner in which the natives of Peru collected the bark at this time, often destroying the trees, while making no attempt to plant new ones, suggested that there would soon be a shortage of the valuable drug. This possibility aroused attention in Europe and prompted serious efforts to cultivate the tree, on a large scale, in countries where the climatic conditions were suitable. In 1839, Royle strongly advocated the introduction of cinchona into India and, after a long delay, this was carried out through the efforts of Sir Clements Markham; not, however, before the Dutch had commenced the cultivation of the trees in Java.

The success which attended the latter enterprise was chiefly due to Charles Ledger, a Londoner, born in Bucklersbury, whose story is not without an element of romance.

After travelling in South America in the employment of the New South Wales Government buying alpacas, he succeeded in obtaining, through a native servant, some seeds of the Cinchona calisaya from Bolivia. Owing to the jealousy of the natives, who became enraged, this

man was afterwards so ill-treated that he died from the effects.

Ledger sent the seeds to his brother in England, who first offered them to the British Government, but the offer was not entertained. He then sold half of them to a Ceylon planter, and the remainder to the Dutch Government for about £33. From these seeds 20,000 plants were raised in Java, and so the great industry, from which millions of money have since been made, was founded.

Until the beginning of the nineteenth century, cinchona bark was still used in its crude state, although several unavailing attempts had been made to discover its active principles. It was not until 1810 that Gomez of Lisbon succeeded in unlocking the secrets of the bark and isolated its basic properties, which he called cinchonino.

A few years later, Pelletier and Caventou, the French chemists, set out to study the whole chemistry of cinchona, and in 1820 they were able to prove that the cinchonino consisted of two distinct alkaloids, one of which they called quinine and the other cinchonine.

The next advance was made by Henry and Delondre, who in 1833 isolated quinidine. This was followed by the discovery of cinchonidine by Winckler in 1844, while Pasteur produced the alkaloidal derivatives, cinchonicine and quinicine.

Since the discovery of quinine, thirty alkaloids have been found to occur naturally in cinchona barks, and from these there have been many derivatives. Quinine, the most important of the cinchona bases, possesses the most powerful febrifuge properties of all, and is capable of completely neutralizing acids and forming crystallizable salts.

Thus, history has proved that cinchona bark is a drug of inestimable value to mankind and, as Laubert said over a century ago, " is one of the greatest conquests made by man over the vegetable kingdom."

The value of quinine in the treatment of malarial fever, alone, is convincing proof of this statement.

Among other drugs with an interesting history introduced in the seventeenth century, and one which has since proved of great value, is ipecacuanha.

It is first mentioned by Purchas in " His Pilgrimes," in 1625, as a root called Igpecaya, used in Brazil as a remedy for the flux. Although it was in general use in that country at that time, it was not introduced into Europe until 1672, when a traveller called Le Gras brought a quantity to Paris, some of which came into the hands of a master-apothecary named Claquenelle.

According to another account, it was known about the same time in Holland, where a Dutch empiric of German extraction called Schweitzer made use of it in the treatment of dysentery and diarrhœa, with considerable success.

His son, Jean Adrien, who took the name of Helvetius, set out for Paris with the object of exploiting the drug as a secret remedy for these complaints; and was so successful that he soon became famous for his cures.

The Dauphin was taken ill with dysentery, and the treatment prescribed by the royal physicians proving ineffective, the remedy of Helvetius was tried and brought about a speedy cure.

This brought him to the notice of the King, Louis XIV, who appears to have taken an interest in new medicines, and, in 1686, he persuaded Helvetius to part with his

secret for the sum of a thousand louis d'or, while granting him a monopoly to sell the drug for four years as a specific for dysentery. Later on, he was appointed Inspector-General of the hospitals of France and eventually became physician to the Duc d'Orléans.

Helvetius used to administer the drug in the form of a decoction and occasionally as an enema. At first he gave it in large doses, but afterwards found it was less nauseating and quite as effective when given in small quantities.

Another drug introduced into this country from India about this period was catechu, an astringent, extracted from two species of acacia, which was also used in the treatment of dysentery and diarrhœa. It appears to have been first exploited in London by P. Brook, the keeper of a bagnio in New Red Lyon Street off Holborn, who advertised its virtues by means of a bill.

It was originally known as Indian Cattee, and Brook apparently went to some trouble to trace its history, which he sets forth in quaint language in the following bill.

" Cattee," he states, " is the only true composition of Catechu whereof there are two sorts. The Right is treated by John Huighen Van Linscholen in his ' History of his Voyages into the East Indies,' printed Anno 1598, page 107.

" ' They use,' says he, ' to wit the Indians, a mixture made of a certain Wood or Tree made into little rolls called Cattee which is very good for the Maw and against stinking breathe; a Soveraign medicine for the Teeth and fastening the gums; very good against the Scurvy; and it is most true, that in India very few are troubled with toothache, scurvey or any such diseases.

'The King,' says he, 'and Lords of India use rolls made of Cattee, Aracca, Camphir, Lignum Aloes and Amber Greese, which they continually eat mixt together.'

"Next Schroder and thence Salmon in his 'New London Dispensatory' terms it a Japonick earth of a purple colour, with white specks as if mouldy, very sharp in taste, melts in chewing, leaving a sweetness behind it. It is drying, and held in the mouth it dryes up all catarrahs and strengthens the head.

"The common sort called Cashew is of a concrete hard substance, like old Spanish Juice of Liquorish, the which made up with musk into little grains is vended by the name of Cashew, which though for goodness nothing like it, many supposing it to be the same as Cattee hath obliged me to give this account of both, that Cashew may not be mistaken for Cattee, which is only there recommended as it is made up with its specifhick admixtures after the true Indian manner (which is only known to myself) into little rolls or confects; whereof one or two being held in the mouth, and as it melts swallowing down the moisture, it so strengthens and comforts the stomach, head, heart, breast and lungs, drys up all Rheums, helps digestion and preserves the teeth and gums, or such like infirmities as are found among the Indians, whereof I have seen the Experience as having lived more than ten years there.

"If three or four confects be put into half a pint of scalding hot water, with the like quantity of fine sugar, as put into so much tea, it makes as excellent a Drink, having all the vertues and properties both of tea and coffee. And one or two Confects put into a pipe of tobacco it yields a curious fragrance."

The origin of the word cachou, now applied to little aromatic pellets to sweeten the breath, is interesting.

The use of foxglove or digitalis in medicine goes back

to the Anglo-Saxon period, where it is mentioned in the " Leechdoms " of the twelfth century.

The word is said to be derived from the Anglo-Saxon *foxesglew*, *i.e.* fox music, in allusion to an ancient musical instrument, consisting of bells hung on an arched support. It is mentioned in the " Liber Medicinalis " of Apuleius, and in a " Vocabulary of the names of plants " of the eleventh century, as *foxes glofa*, while in a later Vocabulary of the thirteenth century it is called *foxesglove*.

The ancient Welsh " Physicians of Myddvai " appear, from the manuscript containing the names of the drugs they employed in the thirteenth century, to have made frequent use of foxglove as an external remedy.

It is evident from these references that the herb was known and used for medicinal purposes from an early period.

Fuchius describes it in his " Plantarum Omnium Nomenclaturæ " in 1541, and gave it the name of digitalis, in allusion to the German *Fingerhut* (finger-stall).

In the sixteenth century it passed into the " Herbals " and is mentioned by Turner, and by Gerarde in 1597, who states, " it doth cut and consume the thicke toughenesse of grosse and slimie flegme and naughtie humours." In 1640, Parkinson, who was an apothecary, remarks on its value in " extenuating tough flegme or viscous humours troubling the chest," and observes, " there are few physitions use it and it is in a manner wholly neglected."

It was, however, included in the London Pharmacopœia in 1650, which shows it had found a place in the materia medica of the physician at that period.

In 1618, Lobel mentioned that "the country people of Somersetshire employ a decoction for the cure of fever, but its operation is exceedingly violent."

It was chiefly employed in the treatment of epilepsy and as an external application for scrofula or the King's Evil, as well as for wounds and ulcers on the legs.

In a manuscript book of medical recipes written in 1644 the following formula is given for "An Oyntment for King's Evil":

"Stamp a peck of Fox gloves in a stone mortar and add to it a pound of fresh butter and set them on a soft fire for four hours to make the oyntment."

Another "Against ye falling sickness":

"Take purple foxgloves, 2 handfuls of the leaves with 4 ounces of polipodium of the oak. Boil them in beer or ale and drinke ye decoction. One that had this disease 26 years so that he fell with it 2 or 3 times in every month, was so cured by ye use of this decoction that he had not a fitt for 16 months after."

In the eighteenth century, Boerhaave considered foxglove to be of a "poisonous nature," and Haller observes that "6 or 7 spoonfuls of the decoction produced nausea and vomiting."

It was in 1775 that Dr. William Withering of Birmingham first called attention to the properties of digitalis in the treatment of dropsy. He states, in that year, his opinion was asked concerning a family recipe for the cure of dropsy.

He was told that it had long been kept a secret by an old woman in Shropshire who had sometimes made

cures after regular practitioners had failed. This medicine was composed of twenty or more different herbs, but he concluded that the active ingredient was foxglove. He then began to experiment with it in his practice and soon found it to be a powerful diuretic and useful in the treatment of dropsy. After hearing that Dr. Cawley, the Principal of Brasenose College, Oxford, had been cured of the disease by taking foxglove root, he determined to pursue his investigations with the drug, but continued to use the leaves, either as an infusion or in the form of powder.

He states that, later, another famous family recipe for dropsy was brought to his notice in which foxglove was the active ingredient. This was mentioned to him by a lady from the west of Yorkshire, who assured him that the country people in that part often cured themselves of dropsy by drinking foxglove tea.

Withering continued his experiments and left a record of 163 dropsical cases, in which he had used the drug with more or less success, between 1775 and 1785.

As a result of his experience he noted that digitalis did not invariably act as a diuretic; but it also had another important property in its action on the heart. He observes, that "it has a power over the motion of the heart to a degree yet unobserved in any other medicine, and that this power may be converted to salutary ends," and this since his time has proved correct.

Withering was therefore the first to recognize the value of digitalis in cardiac diseases, in the treatment of which it now occupies an important place.

The aromatic spirit of ammonia, popularly known as "sal volatile," is said to have been originated by Sylvius

(de la Boe) about 1650, who called it the " Carminative Spirit of Sylvius."

The formula went through various modifications and was eventually included in the London Pharmacopœia of 1721 under the name of Spiritus Salis Volatilis Oleosus. Quincy alludes to it as "a most noble cephalic and cordial mightily now in use." At that time it was composed of sal ammoniac, cloves, musk, salt of tartar and spirit of wine; but this formula was altered in 1746, and again in 1788, when it was called compound spirit of ammonia. In 1809 it became officially known as aromatic spirit of ammonia.

During the seventeenth century many new drugs were introduced into this country from Virginia and the American colonies, including serpentary in 1636, and cimicifuga in 1696. Senega became known in England in 1734, podophyllum in 1731, krameria, which came from Peru, in 1796, and about the same period, quassia was introduced from Jamaica, angustura from Venezuela, kino from India and calumba from East Africa.

The history of some of the compound remedies that have survived from the seventeenth century is also perhaps worth recording.

The preparation known as the Aromatic Chalk Powder, which is still included in the British Pharmacopœia, has a curious origin. When Sir Walter Raleigh was imprisoned in the Tower of London for twelve years, he was permitted to have a room fitted up as a laboratory where he might carry on his experiments in chemistry. Here, it is said, he invented a confection which became known as Raleigh's " Sovereign Cordial " or the " Royal

Cordial," the virtues of which were praised by Queen Anne of Denmark and Prince Henry of England.

Lefevre, the chemist and apothecary to Charles II, is said to have prepared some of this confection for administration to his Royal master during his last illness.

The original formula is said to have consisted of forty roots, seeds and herbs, macerated in spirit of wine and then distilled. The product was then to be mixed with bezoar stone, pearls, coral, deer's horn, amber, musk, antimony, and combined with various earths, sugar and other substances.

Under the name of " Raleigh's Confection " it found a place in the London Pharmacopœia of 1721, and the formula underwent various modifications until the middle of the nineteenth century, when it survived in the form of Aromatic Chalk Powder.

Another remedy which was included in several pharmacopœias of the eighteenth century was the " Earl of Warwick's Powder," the origin of which is ascribed to Robert Dudley, son of the famous Earl of Leicester and favourite of Queen Elizabeth.

This compound consisted of scammony, antimony and cream of tartar, and is described in a book written on it by Cornacchini of Pisa, who declares that the preparation possesses " marvellous medicinal properties."

The name of the Duke of Portland is associated with a " Gout powder " which became famous in the eighteenth century. This remedy was originally known in Italy as " Pulvis Principis Mirandole," and its fame as a cure for gout spread to England, where the Duke of Portland, at that time, was a martyr to the painful disease. He was persuaded to try the powder, and was so delighted with

the result that he had the formula and directions for use printed on leaflets, which he distributed to his fellow-sufferers.

The remedy was composed of birthwort, red gentian root, the tips and leaves of germander and centaury; powdered and mixed together.

A drachm was to be taken for a dose every morning, fasting, for three months, and after that period half a drachm daily for the rest of the year.

A preparation which acquired a world-wide reputation in the eighteenth century, and which is still employed, is the well-known "Dover's Powder." It was invented by an adventurous sea-captain named Thomas Dover who was born in 1660.

Part buccaneer and part adventurer, he had a remarkable and romantic career and is said to have been the rescuer of Alexander Selkirk, the prototype of the immortal Robinson Crusoe, from the island of Juan Fernandez in 1709.

After retiring from the sea, he settled down in London in 1728 to practise medicine, and in a chapter on gout in a book he published, he gave the formula for a "diaphoretic powder" consisting of opium, potassium nitrate, vitriolated tartar, liquorice and ipecacuanha, which he had found to be very effective in that disease.

This powder, which became known as "Dover's Powder," was largely used in the treatment of fevers, and proved of such value that it was eventually made official in the London Pharmacopœia under the name of Compound Powder of Ipecacuanha. Modifications have since been made in the formula, and it still remains an official and valued preparation.

Almost as celebrated in the middle of the eighteenth century was the "Fever Powder" originated by Dr. Robert James. James was a man of considerable attainments and a great friend of Dr. Samuel Johnson.

He was the compiler of a great "Dictionary of Medicine" and also the "Pharmacopœia Universalis." His "Fever Powder" became famous about 1746, when he took out a patent for the preparation. He declared the formula as follows:—"Take of antimony, calcine it with a continual protracted heat in an earthen vessel, adding to it from time to time sufficient quantity of an animal oil and salt. Boil in melted nitre and separate the powder from the nitre by dissolving it in water." He assigned the right of sale to John Newbery, a bookseller and druggist in St. Paul's Churchyard, who sold it for 2*s*. 6*d*. for four doses.

"James's Powder," as it came to be called, was included in the London Pharmacopœia in 1787, the formula consisting of ter-sulphuret of antimony and hartshorn shavings. This was found to be too strong and was modified, on the recommendations of Dr. Abernethy and other leading medical men of the time. It still finds a place in the British Pharmacopœia and now consists of antimonious oxide one part mixed with two parts of calcium phosphate. Fielding, Gray and Coleridge sang its praises and extolled its virtues.

Horace Walpole, too, was a firm believer in "James's Powder" and swore he would take it even if his house were on fire, while Oliver Goldsmith dosed himself with it to such an extent that he is said to have killed himself by taking too much of his favourite remedy during his last illness.

Richard Cumberland indited an "Ode to Doctor Robert James" in 1776, which begins:

> "Oh thou, to whom such healing power is giv'n,
> The delegate, as we believe, of heaven."

Artificial mineral waters were the invention of an apothecary named John Coniers, who had a shop in Shoe Lane in 1678, but afterwards removed to the "White Lyon" in Fleet Street.

Coniers, in a bill he issued on May 12, 1679, states, that "he prepares and sells an essence made of ye Minerall from which quicklie you can make Tunbridge Waters. Any soft spring water mixt with a little thereof becomes in nature a True Tunbridge Water, of great use to those who desired to be spared ye journey to ye Wells.

"Mixt with Tunbridge Water itselfe, makes it so much stronger as you please. A great advantage to those especially who cannot beare much, mixt with Epsom or other purging waters, makes it ye nature of Astrop Waters."

The popular Seidlitz powder was invented by Thomas Field Savory, who became partner with an apothecary named Paytherus in 1797. He patented the powder in 1815 and was the founder of the firm of Savory and Moore. Among their patients was Emma Lady Hamilton, who whilst Nelson was at sea resided for some time in New Bond Street.

CHAPTER XIX

THE MYSTERY OF THE DRUGGIST'S CARBOYS

THE origin of the large glass vessels, technically known as carboys, which when filled with varied coloured water are distinctive of the shop-windows of the chemist and druggist, have always been regarded with mystery by the general public.

It is with regret that one sees these old features distinguishing the pharmacy are now fast disappearing; for, even if they had no utilitarian value, they possessed a sentimental one.

" The coloured bottles of the chemists," says Sir James Barrie in " Sentimental Tommy," " are the first poem known to the London child, and the chemists who are beginning to do without them in their windows should be told it is a shame."

The romantic glamour of the chemist's shop-window at night also strongly appealed to Charles Dickens, who once declared that they were the only bright and cheery spot in a London street on a dark wet night. Another well-known writer remarks concerning their disappearance: " Those of us who watch the changes wrought in many and familiar things in our present rapid age, cannot see the picturesque drop out of our daily life without a pang of regret."

But so it is, and, alas, these relics of the past are fast

disappearing from the windows of the chemists' shops in our large cities.

Their origin is somewhat obscure, and, as already stated, they were probably adopted from the Near East, where the open-shop front of the drug-seller was often surrounded with glass vessels and jars, containing coloured liquids or substances of bright hues. The shops of the Arab druggists in the bazaars were thus distinguished in the sixteenth century.

In England, the use of the coloured bottles, as a sign of their trade, appears to have originated with the druggists in the latter half of the seventeenth century. At that period there were both druggists and chemists who carried on distinct businesses in London.

The modern chemist and druggist is not a direct descendant of the apothecary, as is often supposed, but is the amalgamation of two callings that did not take place until the eighteenth century. The druggist bought drugs in bulk and sold them retail. He dealt in roots, leaves, fruits, herbs and aromatic waters. Thus he would come into possession of, and have about his shop, the carboys which came to be associated with his trade.

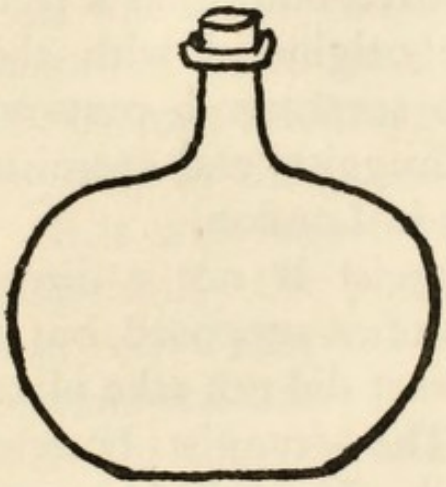
These large globular or pear-shaped glass vessels, of a capacity of from about one to four gallons, known as carboys, do not appear to have come into use until the latter part of the seventeenth century.

According to the Oxford Dictionary, the word carboy is a corruption of a Persian word for a large flagon for wine or rose-water. The name appears to have been originally connected with the large globular-shaped bottles of greenish or blue glass, sometimes covered with basket-work, that were, and are still, used

for the transport of acids and other liquids, and were also formerly employed for wine.

The earliest known allusion to them is by Kæmpfer in 1702, who reproduces a drawing of a carboy, and other references in the eighteenth century mention "carboys of Ispahan Wine, carboys of Rose water and carboys of Cape Madeira."

The vessels of this and other shapes which came to be a feature of the druggists' shops in the eighteenth century were sometimes decorated with golden symbols, which have often been mistaken for the signs and symbols employed by the alchemists for the metals and other bodies. On examination, however, it will be noticed that they vary in many ways from the alchemical symbols. A few bear the signs of the planets and, occasionally, mercury, gold and tin are represented by their usual symbols, but the majority of the signs on the carboys consist of circles, squares and triangles, joined together by short straight lines.



A CARBOY IN 1702

The symbols employed by alchemists were used not only to represent the elements, minerals and other substances, but also processes, apparatus, time and other dimensions. They served not only for secrecy but also as a kind of shorthand, as the symbols used by chemists for the elements and various chemical substances do to-day.

During the eighteenth century, when chemistry began

to develop into a science, many new substances and compounds were discovered and additional characters had to be devised, therefore many of the original symbols were modified.

Bergmann, who was professor of chemistry at Upsala, invented a system in which he made use of the old characters with the addition of some modifications. He first divided substances into various groups, viz. acids, alkalis, earths and metallic calices and others. The first he distinguished by adding a small cross to the side of the

BERGMANN'S SYMBOLS

original symbol. For the oxide or calx of a metal he joined to it the sign for quicklime (calx) as shown in the symbol for the calx of gold.

For the alkali he used a circle with a horizontal line and two dots inside it. Phlogiston, afterwards called oxygen, was represented by the old symbol for sulphur with the addition of a minute circle. He was thus able to represent almost every substance then known to chemists, either simple or compound.

After oxygen had been discovered by Priestley in 1774 an entire change in chemical nomenclature was necessitated, and various systems were devised by Lavoisier, Morveau, Berthelot, Fourcroy and other great

chemists of the time, which are practically the same as those in use at the present day. Hassanfratz and Adet, two French chemists, originated a new system of chemical characters to correspond with it. They submitted this to the French Academy and it was favourably reported on by Lavoisier and published in 1787.

They divided all substances into groups, thus :

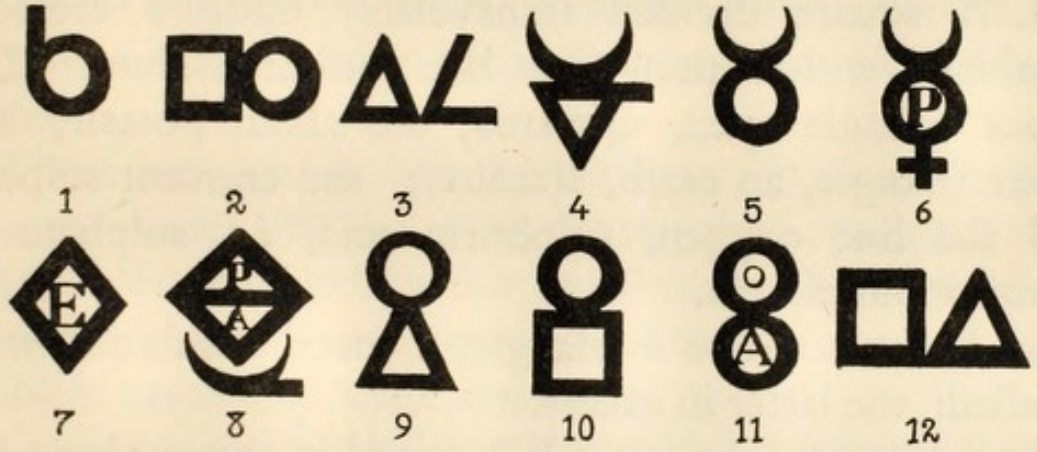
1. Substances which enter into combination with various bodies.
2. Alkalis and alkaline earths.
3. Inflammable substances.
4. Metallic substances.
5. Acidifiable substances.
6. Compound substances.

To the first group belong caloric, oxygen and nitrogen, which were represented by straight lines, perpendicular, horizontal and oblique. The second contains potash and soda, lime and baryta, designated by equilateral triangles, the two first named having the apex pointing upwards, the two second downwards, the initial letters being placed inside each triangle. The third group of inflammable or combustible substances, such as hydrogen, carbon, sulphur and phosphorus, were shown by semicircles, which appear as crescents in the carboy symbols. The fourth group, comprising the metallic substances, was indicated by circles with the initial letter inside. The fifth group, acids or compound acidifiable bases, was shown by squares enclosing the proper initial letter. The sixth and last group of compound substances, like the carboy symbols, consisted of combinations of the above.

When the components of any substances were united in equal proportions, such as in a neutral salt, the symbols were placed side by side; but when one was in excess they were placed vertically, the body in excess being below.

The indications of caloric were very curious; thus, a short vertical line placed above the symbol showed that the body was in a liquid state; if placed below, it indicated that it was in a state of vapour; while the symbol, without this line, was understood to indicate that the body was in a solid state.

This is the explanation of the symbols found on the carboys, and the following are a few of those that were usually employed :



SYMBOLS USED ON CARBOYS IN THE XVIII CENTURY

1. A circle with a short straight line projecting tangentially upwards means a metal in a state of fusion, the circle being the metal and the upright line above it "caloric."

2. A square joined to a circle means a neutral salt of a metal, neutral because they are side by side.

3. A triangle and an angle; an alkali combined with nitrogen and oxygen (nitric acid).

4. A crescent above a triangle, apex downwards, the

base of the triangle being produced on one side, means a combination of sulphur, an alkaline earth and oxygen.

5. A crescent upon a circle, the sulphide of the metal, the sulphur being in excess, *e.g.* a bi-sulphuret.

6. Mercury, the alchemical symbol. The P is a modern introduction. The symbol itself was understood by the chemists of the seventeenth century to mean that mercury consisted of a body of gold, *i.e.* the central circle, partly of silver, the crescent above, and a corrosive element represented by the cross below.

7. A lozenge including the letter E; the lozenge was used for inflammable substances, while the E stood for ether.

8. A square divided transversely upon a crescent combined with a transverse line indicated alum. The upper triangle apex, upwards, the alkali potash; the lower triangle, an earth, alumina; the crescent sulphur and the line oxygen, sulphuric acid, *i.e.* sulphate of alumina and potash.

9. A circle above a triangle, a metal combined with an alkali, the latter in excess.

In some cases the letter F is found in the circle and B in the triangle, the exact significance of which is not evident.

10. A circle upon a square; an acid salt of a metal.

11. Two circles superimposed; an alloy of two metals, the upper gold and the lower silver, the latter being in excess.

12. A square and a triangle; the neutral salt of an alkali.

Examined with the accompanying figures the symbols which appear so mysterious and intricate are easily under-

stood. As might be expected, variations crept in, and as the men who drew these symbols were probably unaware of their meaning, they took a considerable licence in rendering them, especially in those painted in the early part of the nineteenth century.

The large cylindrical vessels called "specie jars," with metal or gilded lids, that still decorate some of the chemists' shop-windows, appear to have had their origin in the glass jars in which the druggists and apothecaries kept their wares.

The specie jar, which dates from the latter half of the eighteenth century and was only used for show purposes, was usually painted white, brown or yellow inside, to represent the colour of the drug or preparation it was supposed to contain, such as magnesia, rhubarb or sulphur.

These jars, which, like the carboys, are soon likely to become relics of the past, were often painted with heraldic devices such as the Royal arms, the arms of the Apothecaries' Society, the sign of the Phœnix or other emblem associated with pharmacy.

Certain measures still employed by druggists have a curious origin. Before 1828, when the Imperial Weights and Measures Act came into force, nearly every town of any importance in England had its own system of weights and measures. Winchester was associated with a liquid measure employed by druggists, and the name "Winchester quart" became applied to a tall, narrow-mouth bottle of a capacity of eighty fluid ounces, whereas the recognized quart measure consisted of forty ounces only. According to the "Encyclopædic Dictionary" a Winchester pint measured forty ounces.

Another measure peculiar to the druggist is the Corbyn quart, equalling forty fluid ounces, a name applied to a squat bottle of that capacity. It was probably originated by the firm of that name who carried on business as druggists at the sign of "Bel and the Dragon" from about 1690.

Bottles were always an important necessity to the apothecary, and he was accustomed to charge his patient extensively for those he supplied. In 1812, a tax was put upon glass, which increased the price of bottles greatly, much to his chagrin, for it was customary then to place each dose of medicine in a separate bottle and he was thus able to charge at the rate of one or two shillings a dose. This practice of dispensing medicine for internal use in single doses or draughts appears to have continued until after the middle of the nineteenth century, when it was superseded and the whole placed in a single bottle from which the dose was measured.

CHAPTER XX

APOTHECARIES AT THE TIME OF THE RESTORATION

IT was not until the latter half of the seventeenth century, that those who had been groping in the darkness after truth, began to see the light breaking through the clouds that had enveloped the natural sciences in the preceding ages and observed the first glimmerings of the dawn of a new era. Sir Theodore Mayerne and De Laune had seen the establishment of the Society of Apothecaries; Mayow and Robert Boyle were laying the foundations of scientific chemistry in the house of an apothecary in Oxford; Christopher Wren had made the first experiment in the intravenous injection of drugs, and Ambroise Godfrey was making phosphorus for the first time in London in his laboratory in Maiden Lane.

At the time of the Restoration, besides the apothecaries who compounded medicines for the physicians and sold drugs to the public, there were the druggists who dealt in herbs, roots and simples, and distilled aromatic waters and sold oils. The grocers also still sold drugs as well as condiments and spices for domestic use, and the chemists, who may be called the descendants of the alchemists, prepared and dealt in the chemicals of mineral origin which were then coming more into use.

Druggists were known in England before the seventeenth century and are mentioned officially in 1662, when they are alluded to in a petition of the College of Physicians for an additional charter, in which they call the attention of Parliament to "the renewed frauds, abuses, deceits of divers apothecaries, druggists and others."

The position of the apothecary at this period is clearly defined by Renodæus, who states, "the Apothecary prepared the medicines for the physicians to administer either for preserving or procuring health, for in his hands consists health and sickness, life and death."

The druggist sold the drugs and simples but did not prepare them.

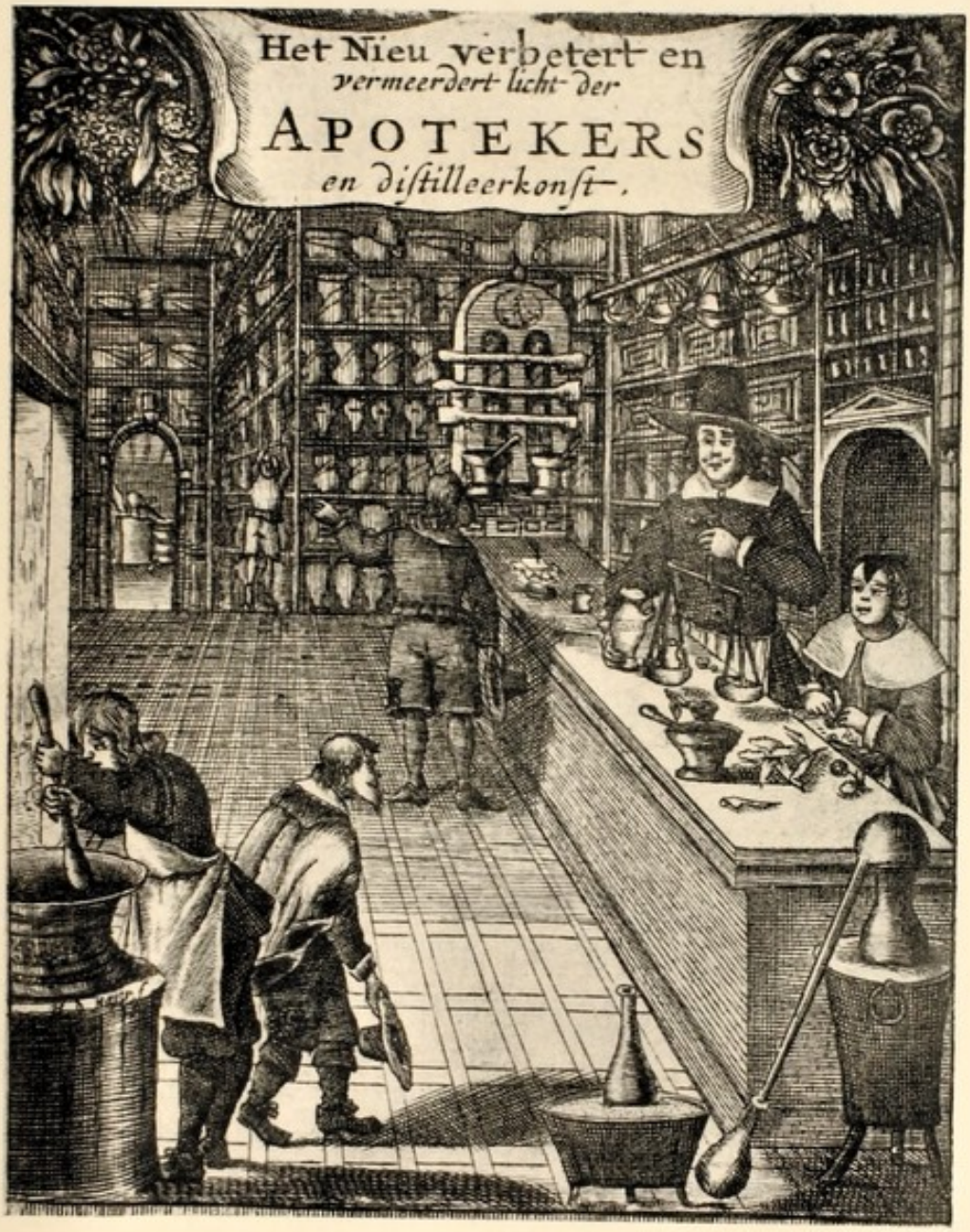
"An apothecary," he says, "first of all should be a lover of piety, one that fears God, void of envy and malice, of good competancy, patient of labour, of great industry and not given to corpulency.

"The subject of pharmacy is the materials of medicine, the end and scope thereof, the one composure of the same, and the apothecary that dares to attempt or assay further, breaks his bounds and limits, is to be accounted a Mountebank, a Quack and Deceiver.

"The office of an apothecary, therefore, is only to exercise or compose certain ingredients to a medicinal form and to adhibit them in a decent manner to salutiferous use, according to the prescript of some skilful physician."

He then gives the following interesting description of the house and shop of an apothecary in his time:

"The Apothecarie's house, when in a city or town, should be in an appropriate and lucid place. It must be ample and high, that such simples as should be kept



AN APOTHECARIES SHOP IN AMSTERDAM
IN 1661

dry may be reposed in its highest room, and such as should be moist in its cellar.

" There should be many, at least one cubicle betwixt these two to which the apothecary may betake himself. His shop should not be too much exposed to the sun, as it may melt or dry his medicines; nor so much to the wind.

" There should be two doors, the one outward to the street and the other inward to his kitchen or inner chamber, wherein he may not only eat his vituals, but prudently observe through some lattice window what is done in the shop, what given and what received, and so mind his apprentices whether they spend their time idly or faithfully and accurately execute their office.

" In the other angle of the kitchen (or laboratory as it was afterwards called) near the chimney, must be an Æstuary or Hypocauste wherein he may repose his sugar junckets and solid confections more safely." The æstuary was a recess with a vent-hole to receive the steam when evaporating over a water bath, and the hypocauste was a hearth with a fire beneath.

" If the place be large enough," he continues, " there may be a Tabern (cupboard) whereon he may record many seeds, fruits, and other simples which he buys in great quantities.

" In his shop he must repose only compounds and such simples that are either rare or precious.

" And that his medicaments may be duly disposed in his Pharmacopoly, many shelves must be classically collocated therein from the bottom upwards, upon wooden and iron nails fastened in the walls and the partition betwixt the kitchen and the shop, so that some of their rows may include lesser, some greater boxes, some earthen pots, some glasses, some tin vessels and some wooden vessels.

" The names also of the medicaments must be inscribed upon every vessel and bag wherein they are

included, that the medicament to be exhibited may soon be seen and not mistaken for another."

In London, most of the herbs and roots in common use at this time were brought to the markets and sold by the herb-women, who brought them in baskets to Newgate Market, Gutter Lane or Covent Garden and sold them by the handful, a dozen for a groat. In the markets, the apothecary also bought his bottles, and in 1656, we learn, he had to pay 1*s.* 6*d.* for a white glass quart and 8*d.* for a glass retort.

Bucklersbury and the neighbouring locality was a favourite centre for the apothecaries, insomuch that Ben Jonson called the former "Apothecaries Street." It is said to have been "replete with physic, drugs and spicerie, and in the time of the Great Plague was perfumed with the pounding of spices, the melting of gums, or the making of perfumes, and so it escaped that great pestilence."

We can thus picture the shop of John Rotheram, an apothecary in Fetter Lane. It was a narrow street, with no pathway to protect the wayfarer from the jostling and nudges of the passing chair-bearers, pages and watermen who thronged it at night. The overhanging gables of the houses appeared almost to meet, and the only light was from an occasional lantern swinging in the darkness.

A strong pungent smell which masks even that of the malodorous lane, betokens the shop of the apothecary.

Above the door swings a signboard, emitting groans like some wounded animal, upon which may be discerned by the feeble light from a green lantern suspended over it, the figure of a golden Phœnix with outstretched wings.

Inside, the shop is a throng of people: women buying worm-seed for their children or treacle to drive out the measles, serving-men waiting for their masters' electuaries or clysters, maids anxious to buy Hungary Water to beautify the complexion, Lac Virginis or perfumes for my lady's chamber, which the apprentice behind the counter is busy preparing.

In a little room at the back of the shop, a woman is seated in a stout oak chair, waiting to be bled. The apothecary, a short, thick-set man with a pointed beard, clad in a red jerkin and dark breeches, is giving her a staff to grasp with one hand and a pewter bowl to hold in the other, ready to catch the blood, while he prepares a bandage and his lancet for the operation. On the walls hang saws, knives, forceps and other surgical instruments; for the apothecary was ready to perform any operation, from the cutting off of a wen to the amputation of a leg.

From the heavy beams that cross the ceiling of the shop, strange objects hang. Here an alligator with open mouth, there a gaping sunfish with staring eyes, and other mysterious creatures, together with strings of poppy-heads, chamomile, centaury, sage and mint in bunches to dry.

The walls are lined with shelves bearing an array of Delft jars of blue and white for which the Lambeth potters were famous, syrup bottles with curved spouts, unguent pots with bright metal lids and long boxes with gilded labels. Below are rows of drawers for leaves, seeds and roots, bladders for wax, and great vessels for oils and aromatic waters.

In one corner, on a block, stands a massive bronze

mortar, and from a chain above it swings the long pestle, while others of varied length lie on a rack against the wall.

On a desk are the great books and ledgers in parchment covers, while the counter is belittered with phials, pots and boxes of remedies ready for sale, such as the " Elixir Proprietatis," the " true Venice Treacle," the " Vatican Pills " and " Fioraventi's Balsam."

On the back counter stand the scales of varied size, brass weights and mortars, funnels, flasks and matrasses, while away in a far corner, a red glow from the fire discloses the hearth, from which the bulb and pipe of a great copper still protrude and twist snake-like into a tub condenser close by.

Sir Samuel Garth, with poetic licence, thus describes an apothecary's shop in the " Dispensary."

" His shop the gazing Vulgar's Eyes employs
With foreign trinkets, and Domestick Toys.

Here Mummies lay most reverendly stale,
And there the tortoise hung her Coat o' Mail;
Not far from some huge Shark's devouring Head
The flying Fish their finny Pinions spread.
Aloft in rows, large Poppy Heads were strung,
And near, a scaly Alligator hung.
In this Place, Drugs in musty Heaps decay'd,
In that, dry'd Bladders, and drawn Teeth were laid.

An inner Room receives the numerous Shoals,
Of such as pay to be reputed Fools.
Globes stand by Globes, Volumes on Volumes lye,
And Planetary Schemes amuse the Eye.
The Sage in Velvet Chair, here lolls at Ease,
To promise future Health for present Fees."

There is evidence that there were chemists' shops in London in the sixteenth century to which George Baker, a surgeon, makes allusion in 1576. He states, " I do

know some excellent chemists as one Mayster Kemmech, dwelling in Lothburie; another Mayster Geoffray in Crouched Friars, a man of singular knowledge in that way; another John Hoster, which is a paynfull traveyler in these matters as I be proofe, having used of their medicines to the furtherance of my pacient's healthes, and also of one Thomas Hill."

The chemists chiefly occupied themselves in preparing mineral salts, then gradually coming into use. In the sixteenth century, Paracelsus had foreseen the value of mineral substances in medicine, and used antimony and arsenic in the treatment of cancer and leprosy. He also believed in the value of mercury in the treatment of syphilis, and remarked that "the preparation of mercury and all remedies adopted for the cure of this disease, cannot properly be prepared without great skill in chemistry," a truth which has been manifested in recent times in connection with the organic arsenical compounds now used in the treatment of that disease.

He made potassium arseniate by heating arsenic with potassium nitrate, and employed almond oil as a solvent for essential oils. He was aware of the value of alcohol in extracting the properties of vegetable substances, and states, " there is no better way of extracting the essence of roots and herbs than to cut them up as small as possible and boil them in strong wine in a closed vessel, separate them by straining and distil the liquid through an alembic."

He distinguished between the purgative action of vegetable drugs like rhubarb and colocynth, and the salines, such as potassium and sodium sulphates.

He prepared his tinctures from fresh herbs and plants

by maceration in spirit of wine for a month before distillation, and superseded the complicated Galenical preparations of his time by his more simple tinctures, essences, extracts and metallic salts.

In the latter half of the seventeenth century, Robert Boyle did much to advance chemistry as a science, and after a journey through Germany brought back to London a young man called Ambroise Hanckwitz (who afterwards took the name of Godfrey), and with him, about 1660, established a chemist's shop with a spacious laboratory.

It was situated in Southampton Street, which at that time opened into Maiden Lane and extended downwards towards the Strand. It was in this laboratory that phosphorus was originally made.

It was a large irregularly-shaped room, provided with two huge vats supplied with water from the main, which served as condensers to worms of similar dimensions that were attached to the large stills that occupied the length of one wall. Gigantic metal mortars, each with its iron pestle depending from a long wooden-spring beam attached to the ceiling, formed a prominent feature. At a later date, two sublimers for ammonia, the second one with a great leaden receiver, cooled by means of running water and when possible encased with snow, were installed. The walls were lined with shelves, on which stood a great array of apparatus, including still-heads, alembics of various sizes, cucurbits, flasks and recipients of curious shape.

From the muffle of a furnace depended the tongs, irons and other implements for handling the crucibles.

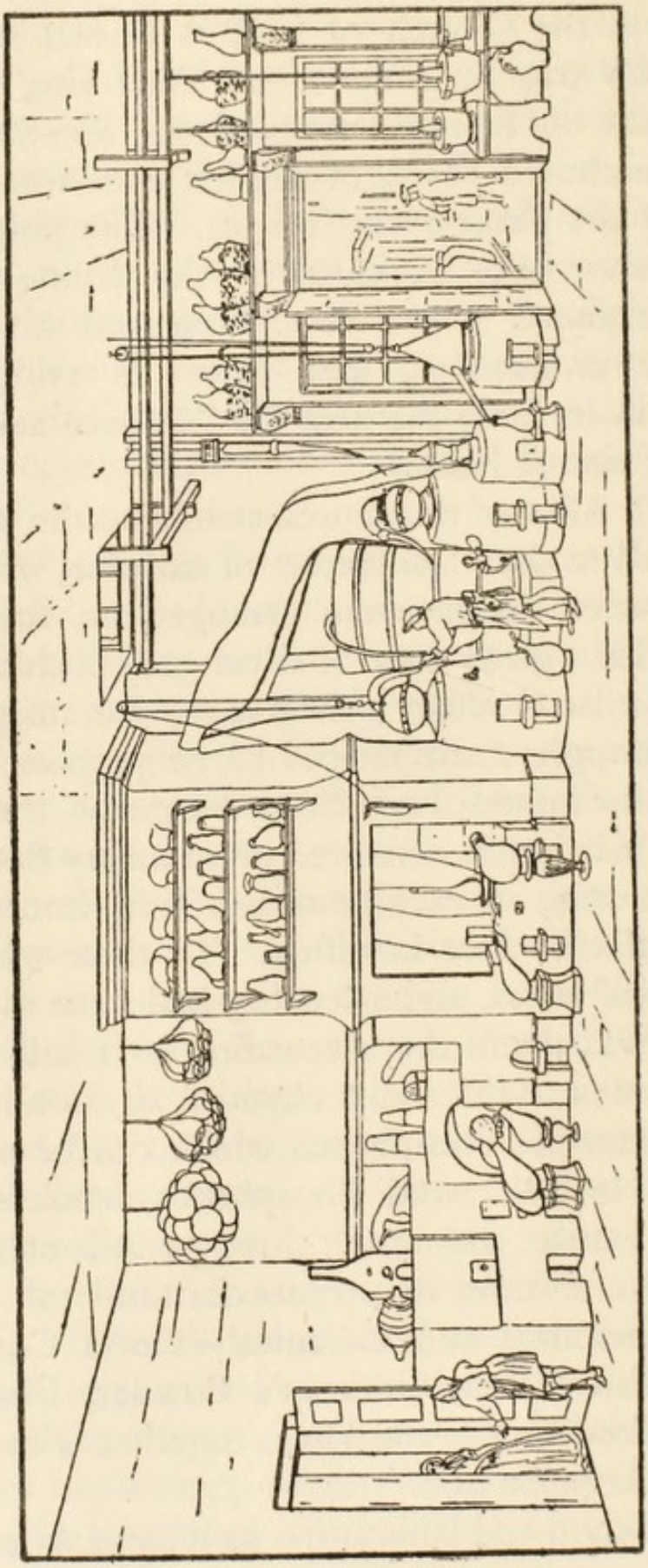
This old laboratory, demolished long ago, can still

be traced in the Church of Corpus Christi in Maiden Lane, which was built upon the exact site, the walls following the old line of construction. Standing on the steps of the church, the right and left entrances mark the position of the phosphorus furnace. The pulpit stands upon the spot once occupied by the drying chamber, a room arranged when ventilation and air currents were little understood, and which is said to have resembled in its main features the "furnace seven times heated" of sacred history.

The High Altar of the church stands on the place once appropriated to the manufacture of carmine, where rows of precipitation basins were arranged on the shelves, together with a great store of silver-grey cochineal.

To Ambroise Godfrey's shop many famous people of the time brought their recipes to be prepared, among whom was the famous Lady Betty Germaine, the formula for whose hair lotion consisted of rosemary flowers and lavender flowers, of each four handfuls, honey 2 lbs., and twigs of vine four handfuls. To these were added four quarts of water, and after they had been macerated, the whole was distilled. According to a bill Godfrey issued, he was "the only chymist in London who makes inflammable Phosphorus which can be preserved in water. He sells solid Phosphorus wholesale, fifty shillings an ounce, and retail, three pounds sterling the ounce. He continues to prepare faithfully all sorts of remedies, Chemical and Galenical—Good Cordials as Royal English Drops, Gaskoin's Powder, Essence of Viper and Essence for the Hair, together with Sundry Spirits and Arquebusade."

Godfrey's shop and laboratory, as it came to be called,



GODFREY'S LABORATORY

became quite a fashionable resort in the afternoons. At the back, a garden stretched down to the Strand, and in the laboratory, on certain occasions, demonstrations and popular chemical experiments were performed for the entertainment of distinguished visitors, who were curious to learn something of the mysteries of the new science.

In 1685 there was another chemist named Peter Sayve who lived at the sign of "The Still" at Pye Corner, West Smithfield, who sold a wonderful water for relieving the gripes, and about the same period, there is evidence from a bill that George Wilson, a chemist, had an "Elaboratory" in Well-yard near St. Bartholomew's Hospital, where he made his "Famous Anti-Rheumatick Tincture."

Wilson states in his bill that "It hath cured several persons of quality and others, not only of Rheumatick Pains but also of other Chronick Diseases.

"It is nowhere sold but at the place mentioned, and by my daughter Mrs. Wilson, at the 'Old Hen and Chickens,' near the New Exchange in the Strand. The Materia Medica and Modus Operandi (in general) shall not be denied to any physician, especially to those Gentlemen that have been entered by me in the excellent and useful Science of Chymistry, of which number there are many Eminent Physicians now living in England, Scotland, Ireland, France, Italy, Germany, Swedeland, etc."

It is evident from this that Mr. Wilson was a teacher of the science with a somewhat wide connection.

That the chemists' shops had increased in London before the close of the seventeenth century may be gathered from the following lines written in 1680:

" 'Mongst all the professions in the town,
Held most in renown,
From the sword to the gown,
The upstart Chymist rules the roast;
For he with his pill,
Does e'en what he will,
Employing his skill
Good subjects to kill,
That he of his dangerous art may boast.
O, 'tis the chymist, that man of the fire,
Who by his black art,
Does soul and body part,
He smoaks us, and choaks us,
And leaves us, like Dun in the mire."

In the early part of the eighteenth century, some of the apothecaries began to swell the ranks of the charlatans and added to their business by selling quack medicines.[1] One of these was John Moore of the "Golden Mortar" in Abchurch Lane, who became celebrated for his "Worm Powder."

He was a well-known character of strong Whig principles, and is alluded to by Swift as the "Great Moor of Abchurch Lane." Pope addressed him in ten stanzas of verse, from which the following is extracted, and was engraved on his tombstone in the village churchyard in Lincolnshire, where he was buried in 1737:

" O learned friend of Abchurch-lane,
Who sett'st our entrails free,
Vain is thy art, thy power vain,
Since worms shall eat e'en thee."

Another curious epitaph, which is inscribed on the tomb of Godfrey Boyle, a chemist of Dublin in 1753, is as follows:

[1] See "The Quacks of Old London," by C. J. S. Thompson, London, 1928.

" Here lieth to *digest*, *macerate*, and *amalgamate* with Clay,
In *Balneo Arenæ*,
Stratum super Stratum,
The Residuum, Terra Damnata et Caput Mortuum,
Of BOYLE GODFREY, Chymist,
and M.D.
A man, who, in this earthly *Laboratory*,
Pursued various Processes to obtain
Arcanum Vitæ,
Or the Secret to live;
Also, *Aurum Vitæ*,
Or, the Art of getting, rather than making, Gold,
Alchymist-like,
All his Labour and *Projection*,
As *Mercury* in the Fire, *evaporated* in *Fume*
When he *dissolved* to his first Principles.
He *departed* as poor
As the last drops of an Alembic;
For Riches are not poured
On the *Adepts* of this World.
Though fond of News, he carefully avoided
The *Fermentation*, *Evervescence*
And Decripitation of this Life.
Full seventy years his exalted *Essence*
Was *hermetically* sealed in its *Terene Matrass*,
But the Radical Moisture being *exhausted*,
The *Elixer Vitæ* spent
And *exsiccated* to a Cuticle;
He could not *suspend* longer in his *Vehicle*,
But *precipated Gradatim*,
Per Carpanam
To his original Dust.
May that Light, brighter than *Bolognian Phosphorus*,
Preserve him from the *Athanor*, *Empyreuma*, and
Reverberatory Furnace of the other World;
Depurate him from the *Fæces* and *Scoria* of this,
Highly rectify and *volatilize*,
His ætherial Spirit,
Bring it over the *Helm* of the *Retort* of this Globe,
Place it in a proper *Recipient*,
Or *Chrystaline* Orb,
Among the Elect of the *Flowers* of Benjamin;
Never to be *saturated*
'Till the general *Resuscitation*,
Deflagration, *Calcination*,
And *Sublimation* of all Things."

CHAPTER XXI

THE APOTHECARIES OF THE EIGHTEENTH CENTURY—THE BATTLE OF THE DISPENSARIES—THE END OF THE STRUGGLE

THE continual disputes between the physicians and the apothecaries, which began soon after the Society of Apothecaries was incorporated, continued for nearly a hundred years, and culminated in a battle between the two bodies in the early part of the eighteenth century.

To trace the cause of their quarrels we must go back to 1632, when, in the month of June of that year, the Court of Star Chamber made the following order :— " Upon the petition of the College of Physicians, it was ordered that the apothecaries should not make any alterations in the prescriptions brought to them to be dispensed; that they should not sell any poisons (*i.e.* powerful medicines) or (ordinary) medicines without a bill or prescription of the physician, or upon a bill either written or subscribed by him that either buyeth or taketh the same, and that all such bills or prescriptions should be retained and filed by the apothecary as his warrant and order for selling the same." It was also ordered that " no Surgeon in London or within seven miles thereof should take off a limb, trepan the head, open the chest or belly, cut for the stone, or perform any capital operation, such as their own bye-laws require

them to call in the attendance of their Wardens or Assistants, unless in the presence of one or more of the physicians of the College or of His Majesty's physicians."

The apothecaries disliked being put under the control of the physicians, and any interference in the manner in which they conducted their business was keenly resented.

Prior to 1665, the sick had usually been attended solely by the physicians, who prescribed and wrote their bills, which were handed to the apothecary to be prepared; but as time went on, the apothecary began to encroach on the functions of the physician, and with the knowledge he had acquired of the properties of herbs and drugs, he commenced to prescribe as well as to compound medicines. He also had the advantage of being able to charge for his advice as well as for the physic, and so save his patients the physician's fee.

At the time of the Great Plague, when the majority of the physicians in London died, and their survivors had fled from the scourge, the friends of the sick were obliged to call in the aid of the apothecaries, who readily forsook their shops to visit the sufferers at their bedsides. After this period the right of the apothecaries to visit patients at their houses became tacitly recognized and established. It was one they were determined not to give up without a struggle, and when threatened with censure and other penalties by the College of Physicians, they retaliated by refusing to call in the members of that body in consultation.

The keen competition that resulted was badly felt, especially by the younger physicians with whom patients were scarce, and so a very bitter feeling sprang up. They urged the College of Physicians to take drastic steps

to put a stop to the practices of the apothecaries, and raised the old charge that they were enriching themselves at the expense of the poor.

A committee was formed to consider the best method of dealing with the matter, and in 1687, at a meeting of the College, it was decided that all members, whether Fellows, Candidates or Licentiates, should give their advice gratis to all their sick neighbouring poor when desired, within the City of London or seven miles round.

The apothecaries, in response to this, offered to sell medicines to the poor, within their respective parishes, at such rates as the Committee of the Physicians should think reasonable.

But this did not suit the physicians, who ignored the proposal and were resolved to carry out an idea that had been suggested to them, of establishing their own dispensaries to supply medicines at cost price to their poor patients.

Another committee was formed, and at a meeting held in December 1696, " an instrument was subscribed by divers charitably disposed members of the College, in number about fifty, wherein they obliged themselves to pay ten pounds apiece towards the preparing and delivering medicines at their intrinsic value."

This was put into operation, and in February 1697, the first Dispensary was opened in a room attached to the College of Physicians, at that time in Warwick Lane.

Thus the physicians carried the war into the enemy's camp, somewhat unwisely, for they were soon subjected to the same criticism as they themselves had levelled against the apothecaries. The latter asserted that gain and not charity was the mainspring of this new

departure, and declared that the Dispensary had been established with the object of making profits and underselling them. They further charged the physicians with employing unqualified assistants in the Dispensary and with using drugs of poor quality.

So the wordy warfare went on, until a difference of opinion began to be manifested in the College itself as regards its policy, and while some of its members supported the Dispensary, others now expressed their disapproval of it. This dissension delighted the apothecaries, who agreed among themselves not to recommend the "dispensarians" or to call them into consultation. The feeling became so strong that some of the physicians who were opposed to the Dispensary refused to meet their colleagues who were in favour of it.

The physicians on their part declared that "their drugs were finer in quality than those sold by the apothecaries, and fifteen shillings in the pound cheaper than could be obtained elsewhere."

It was about this time, when the bitter and acrimonious quarrel was at its height, that Dr. Samuel Garth (afterwards Sir Samuel Garth), a physician of the younger school, and a man of some literary attainments, became the champion of the "dispensarians." He had won himself a high position in the College and was popular with his patients and friends. A man of fine presence and genial disposition, he had acquired a large and fashionable practice and was a popular member of the famous Kit-Kat Club.

In 1699 a poem was published as a broadside called "The Dispensary" under thinly veiled anonymity, in which the quarrels between the physicians and the

apothecaries were recounted in mock-heroic verse, and the supporters of the latter held up to ridicule. The names of the chief disputants were disguised under initials or as fictitious characters, but there was no mistaking who they were intended to represent. "The Dispensary" became the talk of the town and the first edition was soon sold out. Another quickly followed, in which Garth's name as the author was no longer concealed, and the poem rapidly passed through many other editions.

In the poem, Garth thus describes an affray that he says actually took place in the Dispensary in Warwick Lane, between "a member of the College and his friends, and some of the assistants" employed in compounding the medicines.

"And now the Signal summons to the Fray;
Mock Falchions flash, and paltry Ensigns play.
Their patron God (Apollo) his silver Bow-strings twangs,
Tough Harness rustles, and bold Armour clangs.
The piercing Causticks ply their spightful Pow'r,
Emeticks ranch, and keen Catharticks scour,
The deadly Drugs in double Doses fly;
And Pestles peal a martial Symphony.

Now from their levell'd Syringes they pour
The liquid Volley of a massive Show'r,
Not Storms of Sleet, which o'er the Baltick drive,
Push'd on by Northern Gusts, such horror give.
Like Spouts in Southern Seas the Deluge broke,
And Numbers sunk beneath th' impetuous Stroke.

And now the stagg'ring Braves, led by Despair,
Advance, and to return the Charge prepare.
Each seizes for his Shield a spacious Scale,
And the Brass Weights fly thick as Show'rs of Hail.
Whole Heaps of Warriors welter on the Ground,
With Gally-Pots, and broken Phials crown'd;
Whilst empty Jars the dire Defeat resound"

Its publication brought forth a host of similar broadsheets from both sides, and the "dispensarians" retaliated by taunting their colleagues with playing into the hands of the apothecaries by prescribing large quantities of unnecessary medicines, so they might increase their bills.

Pope, who was a friend of Garth's, sided with the physicians, and thus expressed himself:

> "So modern 'pothecaries, taught the art
> By Doctors' bills to play the Doctor's part,
> Bold in the practice of mistaken rules,
> Prescribe, apply, and call their masters fools."

Dr. Arbuthnot, a famous practitioner of the time, who also was unfriendly to the apothecaries, in an "Essay on the Apothecary," suggested that, to prevent the country being overrun with them, some of them should be anatomized for the improvement of natural knowledge. He charges them with apeing the language of the Faculty in their discourse. Thus at meals they distributed their wine with a little lymph, dissected a widgeon, cohobated their pease-porridge, and amalgamated a custard. A morsel of beef was a bolus, a grillard was scarified, eating was mastication and deglutition, a dish of steaks was a compound of many powerful ingredients, and a plate of soup was a very exalted preparation. In dress, a suit of cloaths was a system, a loophole a valve, and a surtout an integument. Cloth was a texture of fibres spread into a drab or kersey, a small rent in it was cutaneous, a thread was a filament and the waistband of the breeches, the peritoneum."

There can be little doubt that there were groundless charges and exaggerations on both sides, but it is clear that the dispensaries prospered and were largely patronized

by the rich as well as the poor. Two others were established soon afterwards, one being in St. Martin's Lane, Westminster, and the other in St. Peter's Alley, Cornhill.

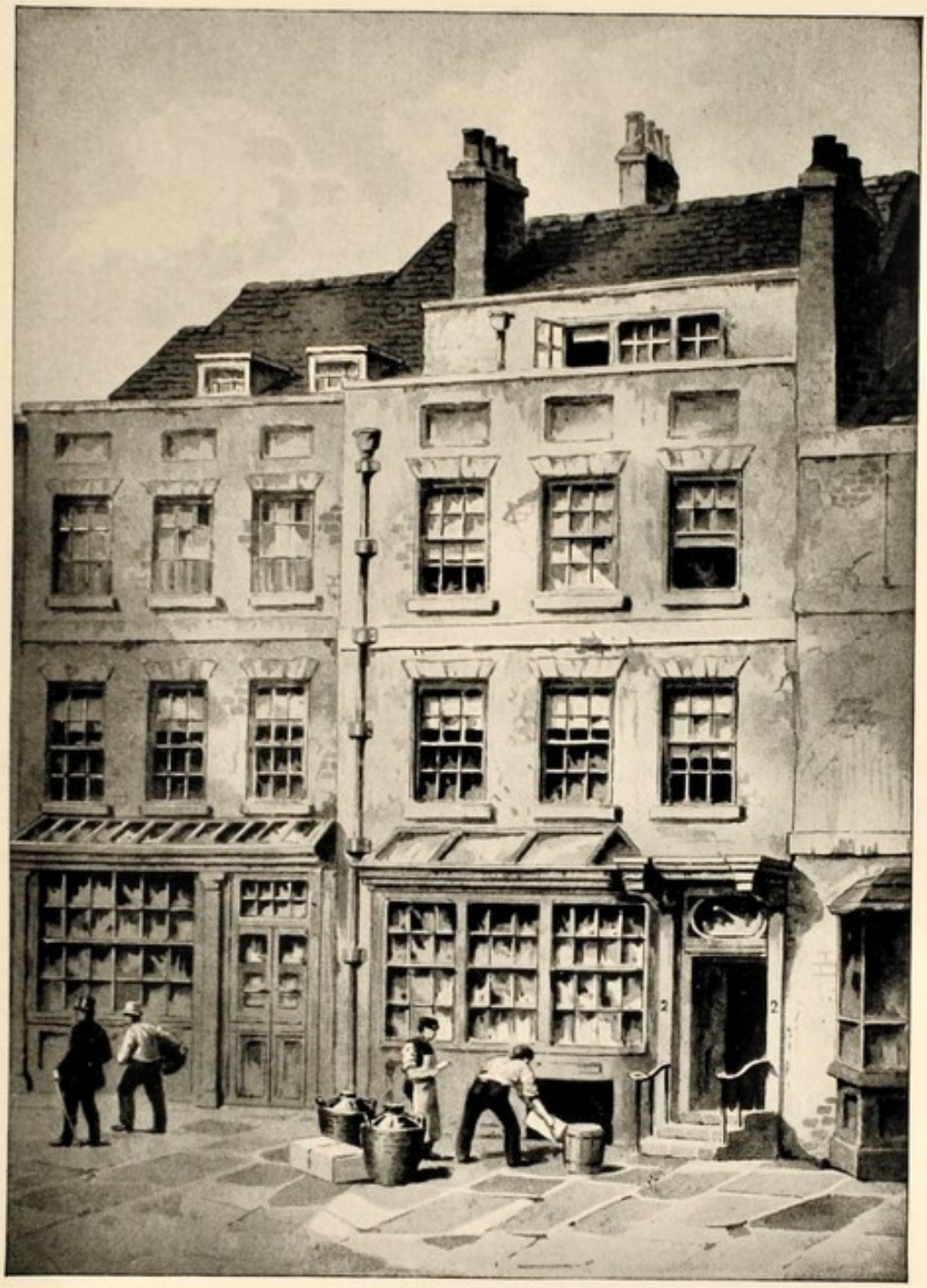
Pitt, writing in 1703, states, " The Dispensaries of the College now make up twenty thousand prescriptions; the doses of the electuaries, juleps, pills, etc., one with the other, may be about a penny a piece, though the most useful drug, though of the highest price, is in every composition."

The disputes were carried on well into the eighteenth century, but in 1721 matters came to a crisis through the prosecution of Mr. Rose, an apothecary, by the College of Physicians, for prescribing as well as compounding medicines. Judgment was given in his favour, and on the case being carried on appeal to the House of Lords, it was again decided against the College, and so the long struggle came to an end.

This decision settled once and for all the apothecary's right to practise medicine, and legally entitled him to visit and prescribe for a patient as well as to prepare the medicine for his treatment.

The apothecaries obtained a further victory in 1727 when Mr. Goodwin, an apothecary, in an action, recovered damages for illegal seizure of his wares by Drs. Arbuthnot, Bale and Levit on behalf of the College of Physicians, which practically put an end to the inspection of the shops.

After their status had been thus legalized, the apothecaries gave more attention to the treatment of patients in their own houses than to the selling of drugs, although they by no means gave it up.



THE OLD APOTHECARIES SHOP IN PLOUGH COURT

XVIII CENTURY

In 1715, according to the London Directory, there were only nine apothecaries' shops between Holborn and Aldgate, while there were thirty-nine druggists' shops and two chemists in the same area.

Among the apothecaries who opened shops in the city about this period was Silvanus Bevan, who, afterwards joined by his brother Timothy, established a business in Plough Court, Lombard Street. In 1766 the style of the firm was changed to "Timothy Bevan and Sons, Druggists and Chymists," and in 1794 William Allen, a man of considerable scientific attainments, became a partner. In 1808 Daniel Bell Hanbury was admitted to the firm, and the business founded in Plough Court in 1715 has been carried on to the present day.

The druggists, who had now spread throughout the country, supported themselves not only by the sale of medicines but also by the sale of miscellaneous toilet articles and tobacco, and the chemists in the large towns were comparatively few in number.

One of the oldest shops of the kind left in the country is said to be in Knaresborough, and still stands on the east side of the market-place of that ancient Yorkshire town.

The business was established by John Beckwith in 1720, but the building is considerably older and is believed to date from Tudor times.

The quaint exterior, with its narrow-sashed windows and small squares of glass, appears to date from the early eighteenth century. Inside the shop is a stout oak pillar on which are nailed strips of leather, which are said to have been originally used to hold quills of quick-silver which were sold as charms against rheumatism.

Until the beginning of the nineteenth century, a dog was employed in the laboratory at the back of the shop to work a wheel which operated a large pestle and mortar used for mixing ointments.

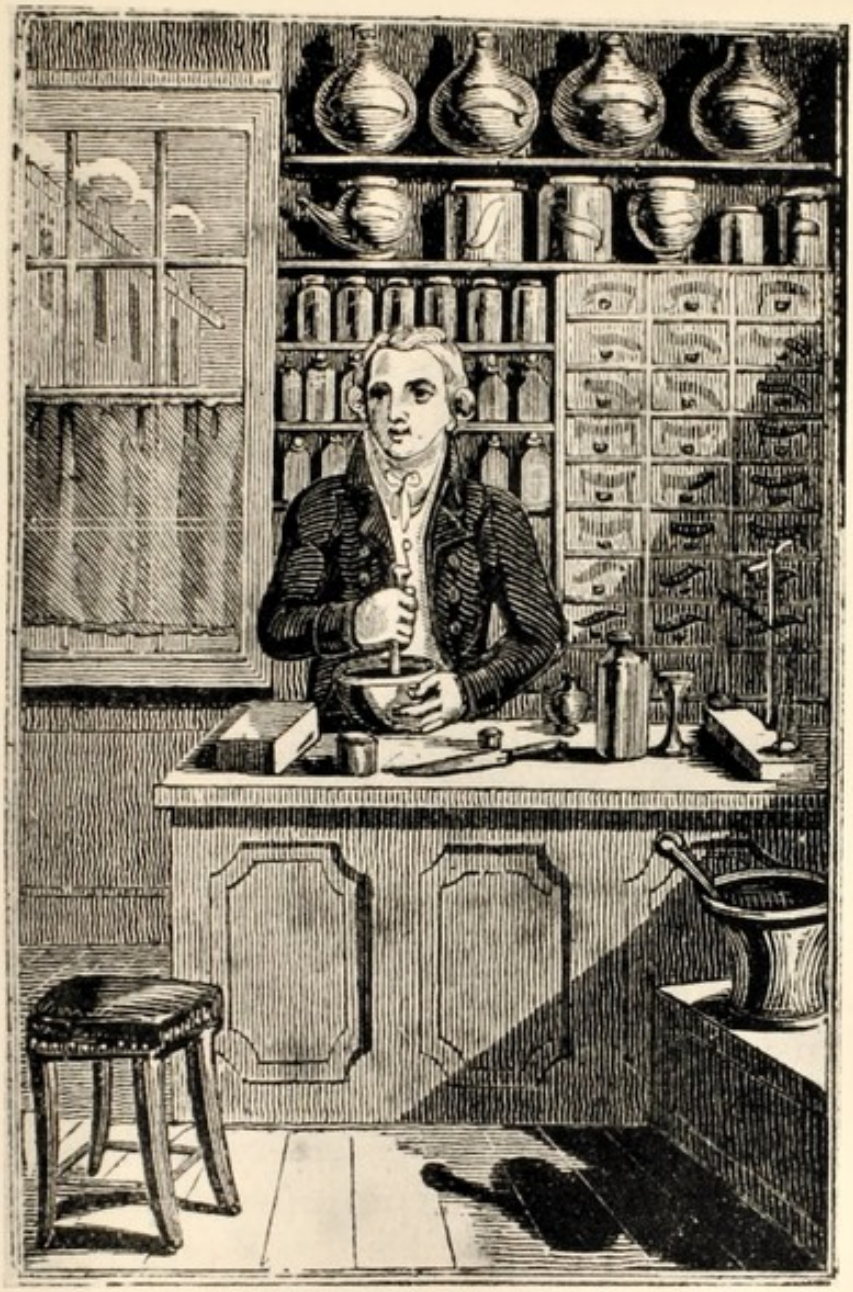
By the end of the eighteenth century the chemists and druggists had absorbed a considerable proportion of the sale of drugs and medicines, and after the first few years of the nineteenth century, had practically monopolized it.

The transfer of the practice of pharmacy from the apothecaries to the chemists and druggists proceeded rapidly, although many medical practitioners still kept open shops and prepared their own medicines.

It is probable that, owing to this curious evolution of the apothecary into the medical practitioner and the chemist combining with the druggist and absorbing the trade side of the apothecary's business, the position of pharmacy in England remained so much behind that of other countries until after the middle of the nineteenth century.

Towards the end of the eighteenth century a dispute arose between the apothecaries and the chemists and druggists, the former declaring that the latter had encroached on their calling by vending pharmaceutical preparations and compounding the prescriptions of physicians.

In 1794, a meeting of the apothecaries of the kingdom was held at the " Crown and Anchor " in the Strand, at which Parliament was urged to take action, and a society was formed called the " General Pharmaceutical Association of Great Britain." But this body only had a short existence, for, in 1802, the apothecaries and chemists and druggists were brought together and induced to com-



AN APOTHECARY IN HIS SHOP

From a print. Early XIXth Century

bine, for the purpose of protecting their interests, against the Medicine Act, which, however, was passed that year. The apothecaries then complained that the chemists and druggists had greatly deteriorated the profits of their business. It had indeed become difficult to define who was, or who was not, an apothecary.

In 1815, they again applied to Parliament and obtained an Act which gave them powers against other persons, similar to those which the physicians thought they had obtained against them. Unqualified persons were forbidden to judge of disease by external indications and to supply medicine for medical treatment.

This Act was strongly opposed by the chemists and druggists, and the apothecaries offered to insert a clause, allowing all persons carrying on the business of a chemist and druggist to be exempt from it. The latter, however, would not agree to this proposal and drafted a Bill of their own, in which they defined their craft as " consisting of the buying and preparing drugs and medicinal compounds and selling them wholesale and retail."

In 1841, the chemists and druggists, having resolved that they must combine to protect their own interests, led by Jacob Bell, formed the Pharmaceutical Society of Great Britain, a body which in 1843 was incorporated by Royal Charter.

Referring to the apothecary at the close of the eighteenth century, Adam Smith says, " He is the physician to the poor at all times, and to the rich whenever the distress or danger is not great."

This, no doubt, truly described the practice of the apothecary during the later period in which he flourished.

The name is now practically obsolete in this country,

with the exception of the titles " Surgeon Apothecary " and " Apothecary to the Household," still attached to Court appointments held in London, Windsor and Balmoral.

The Society of Apothecaries still remains as one of the bodies forming the Conjoint Board which grants registerable qualifications to practise medicine, and its licentiates may now style themselves physicians and surgeons.

Thus ends the story of the apothecary. Although he has ceased to exist in name, his art still survives, and though stripped of much of its ancient mystery, it is likely to live, so long as suffering humanity has need of drugs and medicines to alleviate the ills to which the flesh is heir.

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