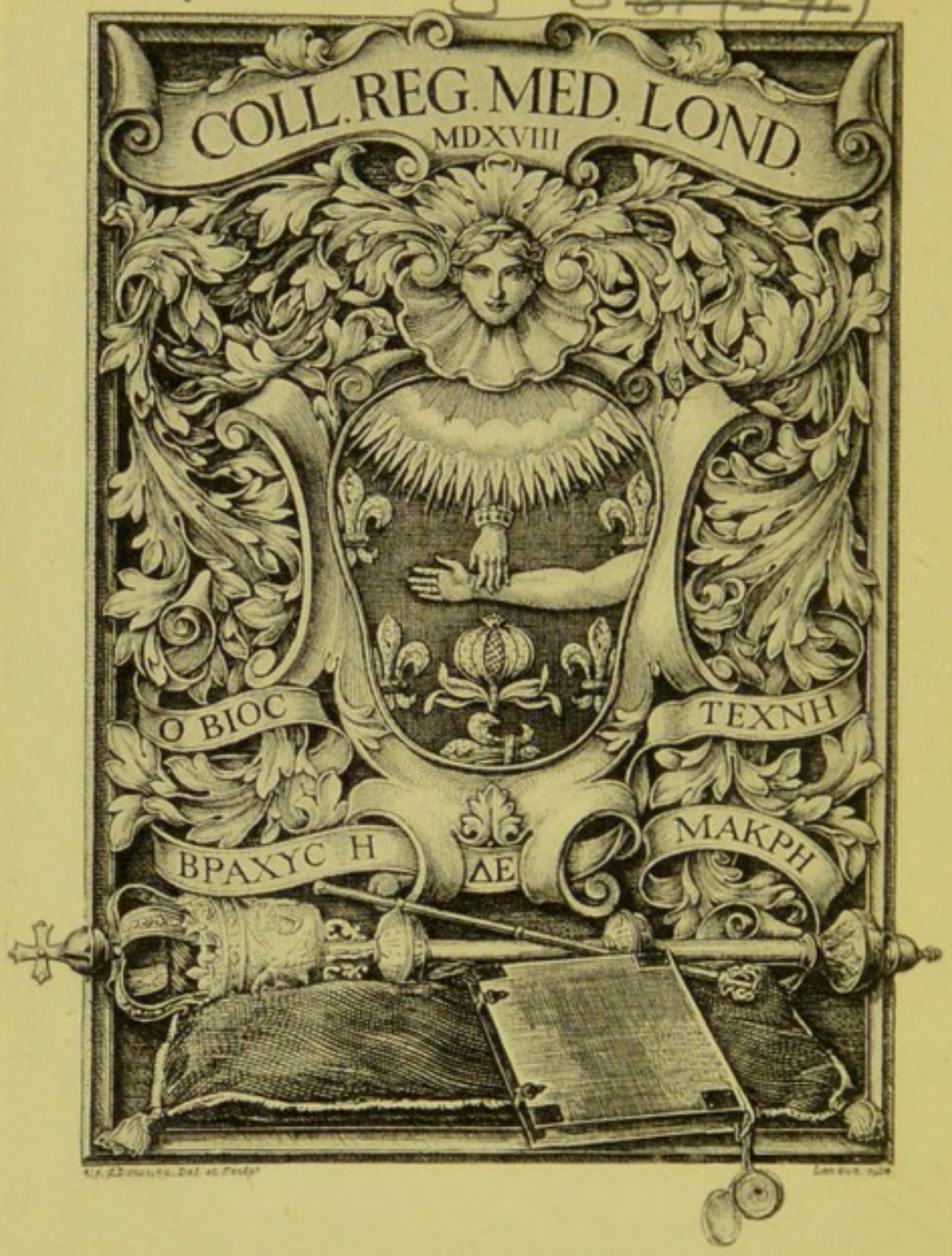
The practice of medicine among the Burmese / by Keith Norman Macdonald.



THE

PRACTICE OF MEDICINE

AMONG THE BURMESE,

TRANSLATED FROM ORIGINAL MANUSCRIPTS,

WITH AN

HISTORICAL SKETCH

OF THE

PROGRESS OF MEDICINE,

FROM THE EARLIEST TIMES.

BY

KEITH NORMAN MACDONALD, M.D., ERLANG,

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS; AND
LICENTIATE OF THE ROYAL COLLEGE OF SURGEONS, EDINBURGH;
LICENTIATE OF THE ROYAL COLLEGE OF PHYSICIANS, LONDON;
LATE CIVIL SURGEON OF PROME.

EDINBURGH:
MACLACHLAN AND STEWART.

MDCCCLXXIX.

EDINBURGH :
PRINTED BY H. AND J. PILLANS,
12 THISTLE STREET.

PREFACE.

IN the following pages the author has endeavoured to contrast the progress of medicine among Eastern and Western nations, in order to show the vast difference which still exists between the semi-barbarous peoples of the Asiatic, as distinguished from the more civilised communities of the European continent. That the one should have remained stationary for more than 3000 years, while the other has been advancing—though not without periods of retrogression—affords abundant pabulum for a reflective mind. Apart from the pleasing conviction that, however much our progress may have hitherto been retarded by various causes, it is impossible we shall again lapse into a state of ignorance and barbarism, for which we have to thank the influence of three agencies, viz., climate, the discovery of printing, and the Reformation.

It is not necessary here to adduce arguments in favour of any particular view; the intelligent reader will draw his own inferences as to the various agents

which have led to the growth and development of human progress in this direction, without resorting to the doubtful expedient of a chosen race, or the interposition of miraculous and Providential guiding.

For the sake of simplicity and easy reference the author has arranged the historical portion, which necessarily partakes more or less of the character of a compilation, in *nearly* chronological order, with marginal notes, as otherwise it would be almost impossible to treat of the various subjects under review at any length within the compass of this work. And, indeed, it is doubtful if the ancient history of our art is worth treating in any other way, for, though medical historians, as a rule, follow out each school or nationality to its termination, and then resume the historical thread, the author is not sure that this is the best way of impressing the facts in connection with the past history of our profession upon the minds of others, or of adequately imparting in a condensed form the results of the labours of those who have gone before us.

Gowan Park, Cupar-Fife,
July 1878.

ERRATA.

Page 66, line 3 from bottom, *for* "Hakim," *read* "Hakeem."

Page 80, line 12 from bottom, *for* "De medicinæ re," *read* "De medica re."

Page 80, line 9 from bottom, *for* "Graccos," *read* "Græcos."

Page 130, foot note, *for* "Vol. II." *read* "Vol. I."

Page 141, line 12 from bottom, *for* "Krobadin," *read* "Krabadin."

Page 149, line 8 from top, *for* "Sanitabis," *read* "Sanitatis."

Page 190, marginal note, *for* "1659," *read* "1569."

Page 208, line 11 from top, *for* "Whytt; Porterfield," *read* "Whytt and Porterfield."

PART I.

PRACTICE OF MEDICINE

AMONG THE BURMESE.

THE PRACTICE OF MEDICINE AMONG THE BURMESE.

SOME years ago when in medical charge of the Civil Station of Prome, on the banks of the Irawadi, I managed, with the assistance of Mr S. M'Kertich, an Armenian, and able Oriental scholar, acting in the capacity of Government teacher at that station, to procure the temporary loan of some palm leaf manuscripts without dates, from the Burmese Physicians, from which the following translations have been rendered; but which could not be purchased at any price, partly on account of their great intrinsic value, and partly because they had been handed down from time immemorial from father to son, somewhat after the manner of the oral teachings of the Asclepiades. Regarding them, however, as a literary curiosity, I now publish them for the first time, and for the purpose of contrasting the progress of medicine among Eastern and Western nations. Their extreme simplicity of conception and arrangement, and

the almost total absence of a master guiding mind like that of Hippocrates, clearly indicate that they have been accepted without modification, like Budhism itself, and with which they are probably coeval, from the earliest times; and it is a matter of no small surprise that a people, otherwise apparently very intelligent and crafty, should remain stationary in matters appertaining to religion for thousands of generations without fluctuation.[1]

But such is Orientalism. Though it has been different with Western nations, we shall afterwards find that, notwithstanding the number of philosophers who flourished before the Christian era, shortly after the time of Galen,[2] both medicine and the other sciences lapsed into a state of barbarous ignorance.

Religious fanaticism was no doubt the cause of this retrograde movement, but it appears that man was not destined by his

[1] The only exceptions to this I have met with are that one of the Kings of Pegu, who reigned in the second half of the eighth century of our era, named Tektha, a pantheist, rejected the Budhist Scriptures, paid no reverence to priests, and prohibited his subjects from worshipping images on pain of death. A beautiful woman, as is usual with the Burmese in national afflictions, came to the rescue, and restored the ancient faith. A sect among the Talaings also still reject the worship of idols.—Mason's "Burma," p 22.

[2] A D 131.

very nature to advance without strife. Had religious struggles and wars never existed, and all the bloodshed and other horrors consequent thereon, we should probably now be as ignorant and childish as the Israelites were under the great seer of that magnificent conception of the order of creation of the universe.

Budhism founded about 600 B.C.

The earliest historical account of Burma and Budhism,[1] according to the Rev. Dr Mason, is that "three hundred years before Alexandria was founded, about the time that *Thales*,[2] the most ancient philosopher of Europe, was teaching in Greece that water is the origin of all things, the soul of the world; and *Zoroaster*,[3] in Media or Persia, was systematising the fire worship of the *Magi*,[4] and *Confucius*,[5] in China, was calling

[1] This word and Burma or Birma, is spelt differently by various writers. I adopt the simplest as being the best.

[2] A native of Miletus in Asia Minor, one of the seven wise men, and an early Greek philosopher and founder of the Ionic or physical school of philosophy, who flourished towards the close of the seventh century, B.C.

[3] A great religious reformer and founder of the Parsee religion. He was born in Bactria, according to Parsee accounts, about 550 B.C., but, according to others, he lived long anterior to that period.

[4] A tribe of the Medians set aside for the management of sacred rites.

[5] A celebrated Chinese philosopher and sage in social, political, and religious life, born 19th June 551 B.C., at Shang Ping, in the kingdom of Lu.

on the teeming multitudes around him to offer to guardian spirits and the manes of their ancestors; and *Nebuchadnezzar*[1] was setting up his golden image in the plains of Dura; and *Daniel* was labouring in Babylon to establish the worship of the true God in Judea; a reverend sage, with his staff and scrip, who had left a throne for philosophy, was travelling from Gya to Benares, and from Benares to Kanonj, exhorting the people against theft, falsehood, adultery, and intemperance. No temperance lecturer advocates teetotalism now more strongly than did this sage *Gaudama* twenty-three centuries ago." . . . . "Immediately after the death of this venerable peripatetic, his disciples scattered themselves abroad to propagate the doctrines of their master, and tradition says that one party entered the principal mouth of the Irawadi, where they traced its pebbleless banks to where the first rocks lift themselves abruptly above the flats around. Here, on the summit of this laterite ledge, 160 feet above the river, they erected the standard of Budhism, which now lifts its spire to the heavens higher than the dome of St Paul's, thus founding Rangoon in the second half of the sixth century before

Rangoon founded about 550 B.C.

[1] King of Babylon.

Christ." According to Burmese history, Prome was founded B.C. 444, immediately after the meeting of the second great Budhist council in Wethale, which, it is well known, was held B.C. 445 in Vasali, a city on the Gandak, about twenty miles north of Patna, and five remarkable circumstances are said to have preceded its foundation. A violent earthquake, a portion of land changed into a lake, the appearance of a new river, a mountain sunk into the earth, and the sea dried up in the country of Prome, "situated, as this coast is known to be, on the margin of a line of active volcanoes, stretching up from Summatra through barren island to the mud volcanoes of Ramree island, these notices may be the tradition of some violent convulsions of nature to which Pegu was subjected in ancient times."

Having thus far indicated the antiquity of Budhism, it may reasonably be inferred that medicine, or some attempt at curing diseases, must have existed long anterior to the advent of Gaudama, or in other words, from the time that the country was first peopled. And here it may not be out of place to give a brief ethnological and topographical sketch of the Burmese and the country which they inhabit. As is well

known the Burmese present the Mongolian type of countenance with broad massive faces, round heads, high cheek bones which stand out laterally increasing the breadth of the face, great distance between the eyes, tawny complexion, long dark hair,[1] and scanty beard.[2] Their language is monosyllabic without inflexion, and of Pali or Sanskrit origin. That they were well known to the ancients is clear from Ptolemy's "*Aurea Regio*," being a literal translation of "Suvanna Bumme," the ancient classic Pali name of Thatung.[3] Crawford also mentions that the Pali classic name of Maulmain is "Ramapura," supposed to have been an ancient Hindoo city there.

The first inhabitants of India were of the Tartar stock, or what the Greeks termed Scythians. *Tzetzes* remarks that "every nation dwelling by the blasts of Boreas" are called Scythians, and this is indicated by the language of the tribes on the southern slopes of the Himaleh mountains, being of the Tartar family. *Ctesias* observes that "the

[1] Except the Phoongyees or priests who present closely shaven scalps.

[2] The little beard that does grow being invariably nipped by pincers in the bud.

Mason's "Burma."

mountains abound with trees hanging over the numerous streams which flow through them," and that "once a year, during thirty days, tears flow from them, which, falling into the waters beneath, coagulate into amber," that "there is a flower of a purple colour[1] which yields a dye not inferior to the Grecian," and that "there is also an insect[2] which lives on these amber-bearing trees, the fruit of which they eat, and with these insects bruised they dye stuffs of a purple colour superior to the Persian."

Dr Taylor was of opinion that the country designated here was Assam, but Mason well observes that no other country except Burma answers to all the above conditions.

The Burmese being naturally a fine manly race of people, physically highly developed, and possessing the martial spirit to a considerable degree, their history abounds in exploits and instances of tremendous prowess of no ordinary kind.

Some accounts record that, prior to the time of Gaudama, a nation which dwelt between Nepaul and the Ganges was attacked by the King of Oude from the west, who

[1] Probably Indigo.

[2] The lac insect (caccus lacca) which yields the lac dye of commerce.

conquered the country, and the people fled eastward till they reached the valley of the Irawadi, where they settled and built a city, 100 miles north of Ava, which they called Tagoung.

This event is supposed to have occurred several centuries after the Sanskrit nations first entered Affghanistan, and encroaching upon the valley of the Ganges, drove the aborigines before them to the east.

The Chinese say that about two hundred years before our era the western Tartars having conquered the eastern, nearly subdued China, but were finally driven back by Woote into their own country.

Little reliance can, however, be placed upon these histories, as is well exemplified in the following narrative procured by Colonel Burney from the Royal Chronicles at Ava:

In A.D. 1281, the Emperor of China deputed ten nobles with one thousand horsemen to demand a white elephant of Naratheehapade, King of Pugan, but the envoys having misconducted themselves, the King ordered them, together with the one thousand horsemen, to be put to death, whereupon the Emperor of China was so much exasperated that he collected an army of six millions of horse, and twenty millions of foot, and sent

them down to attack Pugan.[1] The Burmese opposed this tremendous force with four hundred thousand soldiers, numerous horses and elephants, and attacked the Chinese at the foot of the Bamau river, killing so many of them in three months that not a grass cutter was left for their elephants and horses! The Emperor of China, however, kept reinforcing his army until the Burmese were completely overpowered, and then crossing the river devastated the Burmese territory, and destroyed the fair city of Pugan. Meantime the nats or spirits of either nation were fighting together in the air, in which encounter four of the Pugan nats were wounded by arrows, which, of course, decided the fate of the Burmese.

In their customs and habits the Burmese are what may be termed "free and easy," very communicative, and apparently good natured, and, withal, not unlike the Irish in disposition, a good friend but a dangerous enemy. Polygamy is permitted to any extent, and wives can be had cheaper than in this country! Though they can be had for the asking that does not constitute the entire bargain, one hundred and fifty rupees, or

[1] History is here silent as to the commissariat arrangements for such a gigantic army.

L.15, is a fair price for a round faced damsel, whose complexion is preserved by the application of a porridge made of the dust of sandal wood, enhanced by a diadem of strongly scented flowers, large thimble-shaped earrings, a skirt of Manchester checked silk, and a cheroot. The above sum[1] is generally expended in jewellery, and the wealth of a family can generally be guessed by the amount of jewellery which their children wear about their necks, wrists, etc., this being considered the safest means of preserving the family treasures. Both sexes indulge in the use of tobacco, and it is not an uncommon thing to see children under ten running about in a state of nudity smoking their cheroots! It is not considered a vice, so, of course, it is not a vice. How different with the western paterfamilias who, in his pigheadedness, will hold that it is a great vice, yet will indulge in it himself, and expect his luckless offspring to deny themselves of what he appears to enjoy so much!

The women are, as a rule, more industrious than the men. Both sexes bathe together[2] in crowds every evening, especially in the dry

[1] Or marriage settlement.

[2] The men being especially proud of their long hair and elaborate tatooing.

season. The married women never wean their children voluntarily, and it is no uncommon thing to see a child three or four years of age still at the breast. They do not, however, enjoy the social privileges of the sterner sex, and gallantry is a thing with which they are comparatively unacquainted. It would be quite *infra dig.* for a man to reside in the lower storey of a house if a woman occupied the upper, she being the inferior of the two, having no right to reside over the head of a man.

When a woman dies in childbed she is unclean, and cannot enter into the state of neiban or total annihilation, consequently, under these circumstances, the European doctor is frequently consulted in such cases. The most desperate cases I have ever seen were experienced among these poor people, their miserable bamboo huts being so fragile that I have seen my legs slip through the bamboo matting in the middle of an operation!

The Poongyees,[1] or members of the monastic fraternity, are not priests in the ordinary acceptation of the term, but rather monks, whose religious demonstrations are confined to sermons without interfering with the

[1] Literally meaning "great glory."

worship of the people. They are very numerous, live in the kyoungs or monasteries, and can always be recognised by their yellow robes, shaven beards, and bare feet. They live by charity, and on the principle that "sufficient for the day is the evil thereof," or that "the labourer is worthy of his hire," they sally out daily in small groups to secure their daily bread, visiting certain quarters in rotation, accompanied by boys carrying wooden bowls to receive the rice which the inhabitants freely give them. In return for being thus gratuitously fed by the inhabitants they instruct the boys of the country, hence those kyoungs become the national schools of the country. The character of their writing is formed by circles and segments of circles. It is engraved upon prepared strips of palm leaf, and a number of these put together constitute a book. Printing is unknown, but Pali is the language of their literature.[1]

But to return to the general inhabitants,—socially they are very kind and considerate to strangers, and affectionate in their family ties. Both sexes delight in various kinds of sports, the pooay or theatrical performance, being a very favourite one. Wrestling and

[1] Chambers's "Encyclopædia."

buffaloe fighting are also favourite amusements. When roused they are very passionate, and are capable of committing great acts of cruelty; but, taking them all in all, they are undoubtedly a fine manly race, and any one who has lived amongst them must feel the utmost contempt for the Hindoos in comparison.

When a man is hopelessly diseased the physician in attendance recommends music as a tonic, which is generally played all night—a jumble of a pibroch, and something else very badly played—and the patient has frequently the satisfaction of seeing his own coffin, beautifully ornamented, and placed opposite to his house for inspection, and can listen to the strains of music which are to transport his soul into a state of happiness.

Besides the Burmese proper various other races inhabit Burmese territories, viz.: *Talaings* or *Moans*, *Shans*, *Singhos*, *Kyhens*, and *Kareens*, etc. A considerable trade is carried on by these different races, both among themselves and with us. The principal articles of export are teak, rice, cotton, stick-lac, wood, oil, petroleum, catechu, rubies of different varieties, amber, nitre, etc., and among other vegetable productions the following are cultivated to a considerable extent:

cocoa and areca palms, betel, palmyra, the nipa or water palm, bamboo, pine apple, and custard apple, the hapoea a (valuable timber tree, mango), wheat, tea, tobacco, and indigo,[1] etc.

TOPOGRAPHICAL SKETCH.

To any one possessing an aptitude for that delightful study physical geography, Burma affords in its physical aspect, meteorology, and climate, unbounded scope for observation and reflection, whilst to the naturalist and sportsman, it presents unusual attractions through the great variety of its flora and fauna.

The Burman Empire is bounded on the north by Assam, on the south by the Gulf of Martaban, on the east by the Chinese province of Yunnan, by independent Laos, and the Tenasserim provinces, and on the west by the Bay of Bengal, Aracan, Chittagong, Cassay, and Kathec or Munipoor. It extends from 15° 45′ to between 26° and 27°

[1] See "Narrative of the Mission of the Governor-General to the Court of Ava, 1855." By Captain Yule. London, 1858; Winter's "Six Months in Burmah." London, 1858; Malcolm's "Travels in the Burmese Empire;" "Missions of Symes, Cox, Canning, Crawford, and Burney, to the Court of Ava;" and Mason's "Natural Productions of Burmah."

north latitude, and from 93° to about 98° 40′ east longitude, embracing an area of about 184,000 square miles, with a population variously estimated at between four to eight millions.[1]

The province of British Burma, part of which was ceded to the British in 1852, extends for about one thousand miles along the eastern shore of the Bay of Bengal, between 10° and 20° 50′ north latitude, and between 90° and 94° east longitude, embracing an area of about 90,070 square miles, and containing a population of about two and a half millions. According to Dr Francis Hamilton, "In fertility, beauty, and grandeur of scenery, and in the variety, value, and elegance of its natural productions Burmah is equalled by few countries on the earth, and it is occupied by a people of great activity and acuteness, possessed by many qualities agreeable to strangers." One half of the province of British Burma is culturable, but little more than one thirtieth has as yet been placed under cultivation, the remainder consisting of immense forests and tracts of jungle.

The face of the country is particularly picturesque and hilly towards the north,

[1] Blackie's "Imperial Gazetteer."

west, and east, but extends into plains and flats containing paddy cultivation towards the south and along the deltas and valleys of the Irawadi, Kuladan, and Salween rivers, and in many parts along the coast. The principal mountains are the Pegu and Yomohtoung ranges on the eastern and western boundaries, which attain an elevation of about 8000 feet above the level of the sea, rising in some parts to the region of pines and rhododendrons.

Many writers describe Burma as "a beautiful country," but Mason outstrips them all when he says that "though it is beautiful as seen from the coast, it is still more beautiful when seen amid its mountain streams, streams that cannot be surpassed in romantic beauty, even in the annals of poetry itself." A man must be in a fine state of physical health, overflowing with exuberance of animal spirits, to write in this strain, but without any stretch of the imagination there can be no doubt the country and climate in some parts are extremely beautiful. In the vicinity of Prome Crawford thought the scenery was "rarely surpassed for romantic beauty," and Yule describes the view from Saigain "as unequalled." "Nothing on the Rhine could be compared to it; our impression was that the

lake of Como could not be finer, and those who had seen Como said it was not."

It has got an annual average temperature at the coast from May to October of between 75° and 85° Fahrenheit, which in March and April often rises to beyond 100° in the shade, but in many of the valleys in the interior of the country the thermometer frequently in the months of January and early part of February stands as low as 45° Fahr. at sunrise, and as high as 90° Fahr. at 3 P.M. of the same day, thus showing a range of 45° Fahr. within the twenty-four hours.

The climate is moister than that of Upper India. Below the delta of the Irawadi, which is the greatest stream in the empire, having its source in the Himaleh mountains, there are two seasons, the wet season from May to October, and the dry season from November to April. North of the delta in lat. 18° there are three seasons, the cold from November to February, the hot from March to June, and the rainy during the remainder of the year.

The prevailing winds are the north-east and south-west monsoons. The rains which accompany the south-west monsoon generally set in towards the end of May, and continue to the end of October, which considerably

mitigate the otherwise intense heat of the climate.

The annual average rainfall at the coast is about 200 inches, but north of the delta of the Irawadi the great water shed of the country, and especially in the vicinity of Prome, it rarely exceeds 60 inches.

That Burma is naturally a rich country no one need doubt. It is indeed a land "flowing with milk and honey." It is famous for its ruby mines,[1] petroleum springs, and mud wells. In mineral wealth it contains gold, silver, tin, iron, antimony, lead, arsenic, and sulphur; all except gold and silver are said to be abundant, coal also exists in considerable quantities. Besides these are limestone, and marble equal to that of Carara—which is monopolised by the Government for the manufacture of images of Gaudama—saltpetre, nitrate of soda, sapphires, amethysts, garnets, chrysolites, and jaspers.

It has got an extensive trade in rice, catechu, and teak timber. Indeed, perhaps the finest teak forests in the world are to be seen in Burma. Among other vegetable

[1] The present King of Upper Burma or Ava, is said to be in possession of the largest ruby in the world—about the size of a pigeon's egg; no European, has, however, had an opportunity of ever seeing it.

productions may be mentioned maize and millet seed, which are cultivated around Ava, cotton, wheat, and tobacco. The soondry wood, oak of several kinds, fir, and ebony, sandal wood, sycamore and Indian fig, several kinds of palms, tamarind, aloe, camphor, cinnamon, laurel, nutmeg, spikenard, bamboo, sago palm, plantains, kidney and French beans, sesamum, and mustard, black and red pepper, sugar, indigo. The lapet, a Burman tea plant, is also grown upon the hills of Ava, the leaves of which are used as a pickle; turmeric, used chiefly for curries; lac dye, and various other dye-stuffs.

The principal fruits are the mango, orange, pine apple, and custard apple, lemon, lime, durien, beetel nut, olive, ginger, cassia, liquorice, arrowroot, yams, potatoes, etc.

The principal articles of export are rice, teak, catechu, cotton, petroleum, rubies, and other precious stones, most of which find their way to the grand emporium of Rangoon. As commerce, however, is a little beyond the scope of this essay, I shall proceed without further comment to render what the Burmese medical writers have got to say for themselves, beginning with

THE CIRCULATION OF THE BLOOD.

Thway-tek and Thway-thet.

The blood in human bodies has two motions — *Thway-tek*, the blood rising or ascending, and *Thway-thet*, the blood ebbing or descending.[1]

Each continues for six days alternately, and on the seventh day the ascending blood and the descending blood meet in the course of their circulation, when the least derangement in the system at that time causes a disease.

In like manner a bore is caused by the flowing or rising tide, and the ebbing tide, meeting in a tidal river at the end of every sixth hour.

This circulation of the blood either way is on the fourth day influenced by windy matter; on the fifth day by the bile or galleous matter, and on the sixth day by putrid matter, while on the seventh day a general change takes place, the ascending blood having turned its course, and circulating downwards, or *vice versa*. The blood

[1] Hippocrates employs the term ampotis (ἀμπωτις) signifying the ebbing and flowing of tides, to denote the movements of the humours of the body.

is then influenced by the *Ah-ka-tha dât* (literally Heaven element) which sets all the other dâts into a state of commotion.

When the circulation gets out of order a disease follows, and no medicine should be given till after the third day.

Should a looseness accompany such a disease, the descending blood will continue twelve days instead of six; but if, on the other hand, there should be costiveness, the ascending blood will continue for twelve days also, instead of six days.

The human constitution is composed of four dâts or elements:[1]

1. The *Pat-ta-wee*, or earth dât, consisting of the flesh, bones, fæces, etc.

2. *Tay Zaw*, or fire dât, consisting of the heat both external and internal of the animal body.

3. The *Ah-baw*, or water dât, consisting of the blood, sweat, urine, marrow, and other fluids.

4. The *Wah-yaw*, or windy dât, consisting of the wind, which is belched from the stomach, etc.

5. Besides the above four dâts belonging to

[1] This is in accordance with the precepts of the ancient philosophers, viz., that the human body is composed of four elements.

the human constitution there is a fifth called the *Ah-ka-tha*, or Heaven dât, which keeps all the other dâts in motion.

When any of the component parts of either of the four dâts is influenced by the fifth dât, that part of the body to which it belonged is put out of order. If the *Ah-ka-tha* dât acts on the flesh, or bones, the *Pat-tu-wee* dât is disordered, and so of all the others.

THE DAT SYSTEM OF TREATMENT.

Sunday.—Sickness occurring upon a Sunday is caused by the *Pat-ta-wee*, or earth dat, being in excess, and the fire dât which attended the patient at his conception is destroyed, consequently the gall is touched. This disease will subside on the sixth day—that is, on the following Friday, after midnight, and on the twelfth day, Thursday, the patient will completely recover. In the meantime, to bring round the disordered gall, give zeethee[1] in water sweetened with jaggery[2] for three days. Then lime or citron

[1] A species of wild plum.

[2] The name given to sugar obtained by inspissation from the sap (nera or toddy) of palms, chemically the same as cane sugar, when the same sap is allowed to ferment it becomes palm wine, and from it arrack is obtained by distillation.

mixed with chillies, after which, cocoa-nut and jaggery may be given for other three days.

If the earth dât is in excess, the *Ah-ka-tha* dât disappears, perspiration is checked, and the heat of the body is increased. In such a case, give more jaggery and cocoa-nut, rub oil[1] into the skin, and create a good sweat by artificial means; this is generally done by sitting under a thick curtain[2] in the most confined part of the house.

Monday. — Disease occurring upon a Monday, the water dât is in excess, the windy dât, which attended the patient at his conception, is destroyed, and the appetite is lost. This disease will subside on the sixth day—that is, Saturday following, at midnight, and on the twelfth day the patient will completely recover. In the meantime, to restore the appetite, give tamarind (*tamarindus Indica*) for three days, and for the windy dât give neem (*Azadirachta Indica*) and *Gau-ga-lah* (a species of Kæmpfera *Galanga*) for other three days.

For the water dât give plantains and jaggery also for three days.

[1] Celsus lib. 1st. et seq., recommends anointing the body with oil in many diseases.

[2] Not unlike the modern method of using the mercurial vapour bath.

If the water dât is in excess the earth dât disappears, therefore the bowels become irregular, in which case increase the tamarind and jaggery.

Tuesday.—In disease occurring upon a Tuesday the fire dât is in excess, and the gall is disordered. This sickness will subside on the sixth day—that is, on the following Sunday, after midnight, and on the twelfth day the patient will completely recover. In the meantime give roast or fried beef[1] for three days, citron and jaggery for other three days, then rice, flour-cake fried in oil,[2] also for three days.

When the fire dât is in excess the windy dât disappears, the urine and bowels become suppressed,[3] and the patient feels great thirst. When this takes place give more of the fried cake.

Wednesday.—When a disease occurs upon a Wednesday the water dât is in excess, and the appetite is destroyed, constipation follows, but the disease will subside on the sixth day, after midnight, on the Monday following,

[1] This is an improvement upon the Hindoos, who would consider it sacrilege to eat the flesh of a sacred animal.

[2] A favourite delicacy with the Burmese both in health and disease.

[3] In a state of temporary abeyance—dormant.

and the patient will recover on Sunday, the twelfth day of the disease. In these cases give good and nourishing food, rice-flour one handful, one ball of jaggery, one spoonful of clear lime or chunam water, mixed and boiled in one-eighth tical weight of oil, and continue this for three days; then give ripe tamarind and jaggery for other three days; afterwards momordica,[1] neem, and Gau-ga-lah for three days longer. When the water dât is in excess the fire dât is extinguished, and the heat of the body is then driven internally, causing the patient to roll from side to side. In these cases give more jaggery and ripe tamarind.

Thursday. — Sickness occurring on a Thursday is caused by the gall being in excess—then the *Ah-ka-tha* dât which attended the patient at his conception, is disturbed, and the fire dât is disorganised.[2] The sickness will, however, subside on the sixth day, Tuesday, after midnight, and the patient will recover on Monday the twelfth day. To reorganise the fire dât give papaya (*carica paypaya*) or plantain, half ripe, with jaggery,

[1] Momordica charantia.

[2] An intelligent Burmese doctor describes "disorganisation" or "destruction," as applied to the dâts, to mean that they are in an unhealthy state.

for three days, then roast beef with broiled sesamum (*Sesamum Indicum*) or cows' milk, for other three days, and then tamarind or roselle (*Hibiscus Sabdariffa*) or soap acacia (*Acacia rugata*), also for three days.

When the gall is in excess the water dât goes internally and stops the operation of the wind and the belching. Then give more tamarind or roselle or soap acacia.

Friday.—When a disease occurs upon a Friday there is an excess of foul food in the stomach, and the earth dât which attended the patient at the time of his conception is destroyed, the fire dât is disturbed and increases the heat in the system. This sickness will subside on the sixth day, Wednesday, after midnight, and the patient will recover on Tuesday, the twelfth day. In the meantime, to bring the fire dât back to its original state, give citron juice and jaggery for three days, then cow's milk and rice boiled very soft in the milk for other three days, afterwards ripe tamarind dissolved in water also for three days.

When the foulness of the stomach is in excess the gall is in bad order, and the patient sometimes becomes speechless and insensible, when this happens give citron and more jaggery.

Saturday.—Sickness occurring on a Saturday is caused by the *Ah-ka-tha* dât being in excess, the fire dât is destroyed, and the water dât is disturbed. This disease will subside on Friday, the sixth day, and will totally disappear on Wednesday, the twelfth day of the disease. To correct the disorder of the water dât give momordica and neem mixed with lime water for three days, then plantain with jaggery for other three days, and roast beef, with broiled sesamum seed, also for three days.

When the *Ah-ka-tha* dât is in excess the appetite is lost, and the heat in the system is like the outside of a heap of husks placed upon a charcoal fire.

THA-NEE-BAT—FEVERS.

A long and protracted fever is called a *Tha-nee-bât.* From the commencement of this fever the patient is always feeling thirsty, has a cough, and often passes sleepless nights, when he does sleep he breathes very hard, and perspires profusely, the eyes become yellowish red, when coughing he spits up phlegm mixed with blood, there is a buzzing noise in the ears, the tongue is stiff, and almost speechless, the muscles are contracted

(pulled in), and there is heaviness of the body and limbs, pains in the joints, tears flow from the eyes, and the lids are partially closed. The body is sometimes very hot, and sometimes very cold, he becomes deaf, and the colour of the motions of the bowels is black, resembling oil-cake.

When such symptoms arise no medicine should be given to the patient. If he refuses food, and feels his throat very dry, he will die within nine days. If he becomes deaf he may live till the tenth day; but if his eyes become dim and yellowish red he will not live more than five days.

The cause of the internal diseases of men is never known to a doctor unless the symptoms are explained to him, therefore, an intelligent physician on being called to a case will always first inform himself as to the nature of the disease. There are some illnesses for which no medicine is required, lest death or prolonged illness should be the consequence.

When a resident of a cold climate is attacked with a fever or any other disorder, it is caused by phlegm, and when a person removes from a warm to a cold climate he ought to be careful in his diet, using only sour or sweet or hot and spicy articles of food.

If a child gets a fever in cold weather there is an excess of phlegm which produces it, and its food ought to be sour or hot and spicy.

When a child under the age of nineteen is attacked with a fever during the rainy season he should avoid hot and aromatic food.

The above directions are to be followed before giving any medicine, for by this means the nature of the disease will be known.

CHANGE OF LOCALITY.

A change in many cases may be very beneficial to a patient. From one house to another, from one village to another, from the inside to the outside of a house, from an open and windy house to a close and confined one, and from cold to warm, and from a warm to a cold temperature.

By a change into a close and confined place the windy dât of the system is renovated, and by a change to an open and breezy place the outside windy dât is renovated, and the body and limbs become cool, and the fiery dât is dispelled. At the same time, give fried rice-cake and momordica.

By the change from the outside to the inside of a house the *Ah-ka-tha* (Heaven dât)

is increased, and if the *Ah-baw* (water dât) is destroyed and perspiration suppressed, the *Ah-ka-tha* dât must be opened by rubbing oil into the whole body.

This is called the " body sucking disease," and when the Heaven dât is destroyed, and the water dât suppressed, also rub oil and medicine into the body.

A sudden disease is produced by the five dâts counteracting each other, or if the blood be turned from ascending to descending, or from descending to ascending, the whole body and the limbs become benumbed, when this occurs give sweet toddy and jaggery.

If the phlegm be in excess, and heat prevail throughout the body, the proper remedies are citron juice and jaggery. If the wind be in excess the whole body feels itchy, and the patient should get momordica, neem, and *Gau-ga-lah.* If the gall be in excess the patient yawns and feels giddy, and acts like a person possessed of an evil spirit. To combat this give roselle or soap acocia.

When the foulness of the stomach is in excess the patient feels restless and uncomfortable, but can be cured by the administration of ripe tamarind and jaggery.

When the gall is suppressed the patient becomes silent and morose, and when the

blood is suppressed he becomes sad, loses his appetite, and feels fatigued.

The following medicinal roots are the proper remedies for acting upon the four dâts :[1]

For Foulness of the Stomach.

1. A-ka-reet.
2. Say-pa-seik.
3. Oung-mai-bue (*Clitoria ternatea*).
4. Tsee-ma-khau.
5. Kau-gyouk-nee (*Plumbago rosea*).
6. Ka-law-sau (*Cassia occidentalis*).
7. Liug-nay (*Acorus calamus*).

For the Gall (or Bile).

1. Let-touk (male) *Vateria Roxburghiana.*
2. Let-touk (female) (piney varnish tree).
3. Pouny-ma-thein (*Blumea grandis*) camphor.
4. Twin-nek-kyee.
5. Twin-nek-ngai.
6. Tha-ret-kiu.
7. Thek-yiu-gyee (croton).

[1] The author regrets having left the country while investigating this subject.

For the Wah-yaw or Wind Dât.

1. Htouk-sha (*Vitex aborea*) chaste.
2. Nga-bya-yin.
3. Shiu-pa-koo.
4. Taba-sae.
5. Tseiu-ta-baw.
6. Ma-nee-aw-ga.
7. Ya-za-win.

For the Ta-zaw or Fire Dât.

1. Pai-dai-gaw.
2. Meik-tee-tau.
3. Pyingya-linga.
4. Oo-pa-tha-ka.
5. Car-ra-way (*Lauriis nitida*).
6. Tsac-ta-lone.
7. Thit-tsa-bau (*Pardanthus chinensis*).

For the Ah-baw or Water Dât.

1. Yin-byah.
2. Nga-tsine-yin.
3. Shin-kit-tsee.
4. Na-lyah-gyee.
5. Thit-kya-boe (cinnamon).
6. Ma-yoe (*Calotropis gigantea*).
7. Tha-ma-ka (*Poiverea Rogburgii*).

For the Pat-ta-wee or Earth Dât.

1. Tsae-pa-lai.
2. Pa-douk (*Gum kino*).
3. Tsae-boung-nek.
4. Tsoo-kyouk-nek.
5. Quet-tara.
6. Tseik-nan-gyee.
7. Tseik-nan-ngai.

The above different kinds of medicines compounded are to be given for all kinds of diseases on proper days. Previous to administering the medicines the directions already mentioned regarding the appearance of diseases on certain days of the week should be strictly followed.

In the following cases the entire constitution is destroyed.

1. If the *Pat-ta-wee* dât increases, and the fire dât is affected, all the other dâts are totally destroyed.

2. If the *Ta-zaw* dât increases, and the fulness in the stomach continue, all the other dâts are destroyed.

3. If the *Wah-yaw* dât increases and the liver becomes disordered, all the other dâts are destroyed.

4. If the liver increase and the *wah-yaw* dât becomes established, the other dâts will be completely destroyed.

5. If the *Ah-ka-tha* dât increase, and the *wah-yaw* dât remain, all the other dâts are destroyed.

6. If the Fire dât increases and the *Pat-ta-wee* dât becomes established, all the other dâts will be destroyed.

7. If the *Ah-baw* dât increases and the *Ah-ka-tha* dât becomes established, all the other dâts will be totally destroyed.

8. If the *Ah-ka-tha* dât increases and the *Pat-ta-wee* dât becomes established, all the other dâts are destroyed.

The following are the eight cases in which the dâts are suppressed :[1]

1. By the increasing of the *Pat-ta-wee* dât the fire dât is suppressed.

2. By the increasing of the fire dât the *Ah-ka-tha* dât is suppressed.

3. When the *Ah-ka-tha* dât increases the appetite may be destroyed.

4. When foulness of the stomach overflows the gall or liver may be suppressed.

[1] Suppression means that the dât is in a temporary state of disorganisation, and remains dormant without any action. It generally refers to the action of the circulation of the blood.

5. When the liver or gall are inflamed the *wah-yaw* dât may be suppressed.

6. Increase of the *wah-yaw* dât produces suppression of the *Tay-zaw* dât.

7. When the *Tay-zaw* dât is influenced, the *Ah-baw* dât may be suppressed.

8. An excess of the *Ah-baw* dât may cause suppression of the *Pat-ta-wee* dât.

DISORGANISATION.[1]

The *Pat-ta-wee* or earth dât being the chief of all the dâts, may be disorganised under the following conditions :

1. Increase of the *Ah-baw* dât may disorganise it.

2. Increase of *Ta-zaw* dât may disorganise it.

3. Increase of the *Wah-yaw* dat may disorganise it.

4. Increase of the gall may disorganise it.

5. Excess of foulness of the stomach may also disorganise it.

6. Increase of the *Ah-ka-tha* dât may cause disorganisation of it.

7. The fire dât increasing may also disorganise it.

[1] "Disorganisation" means that the dât is in a disordered and unhealthy state. Destruction conveys the same meaning.

TREATMENT OF THE ABOVE MALADIES.

When the fire dât is suppressed by the action of the *Pa-ta-wee* dât the internal heat is extinguished and indigestion follows. To counteract this, give citron and chillies, with citron juice.

When the *Ah-ka-tha* dât is suppressed by the increase of the fire dât, costiveness ensues. The head aches severely, the eyes close, and the muscles at the back of the neck become contracted.[1] In such a case give roast beef and medicine in oil.

When the appetite is suppressed by the increasing of the *Ah-ka-tha* dât, the bowels become costive, and the fæces indurated. To cure this make a mixture of plantain and jaggery, and give copiously to drink, also give a decoction of the root of *thek-yin* (croton).

When the action of the liver is suppressed by an increase of the foulness of the food in the stomach, the patient becomes speechless, indecisive in mind and intention. He starts in his sleep with fright, hangs his head down, and is sullen in countenance.

Give a mixture of zeethee and jaggery to drink, and administer the medicine suitable for this state in citron juice.

When the *Wah-yaw* dât is suppressed from

[1] Probably tetanus.

the influence of the gall or liver, the operation of the wind stops; the muscles of the belly are pulled up[1] (contracted), and the chest is tight and full.

Give momardica, neem, or bitter aloe to eat, and the suitable medicine in lime water or citron juice.

When the *Ta-zaw* dât is suppressed through an increase of the *Wah-yaw* dât, the heat of the body is driven internally, and causes thirst.

In such a case, give *zeethee* in a spoonful of clear lime or chunam water sweetened with a little jaggery to drink, and the appropriate medicine in the same quantity of chunam water.

When the *Ah-baw* dât is suppressed by the overflowing of the *Ta-zaw* dât, the urine and perspiration are checked, and the heat comes outwardly.

Procure perspiration by artificial means, by rubbing oil into the body, and give cocoa-nut and jaggery in oil.

When the *Pat-ta-wee* dât is suppressed by the increasing of the *Ah-baw* dât, the body swells, and is benumbed and cold. For this take rice flour, clear chunam water, oil and jaggery, boil them, and give the mixture to drink, and the suitable medicine in oil.

[1] Probably peritonitis.

DAYS OF APPEARANCE,[1] SUPPRESSION, AND DISORGANISATION OF THE DATS.

With regard to the appearance, suppression, and disorganisation of the dâts, the following may be observed:

1. The *Pat-ta-wee* dât continues in suppression for eight days, and in appearance for nine days.

2. The *Ah-baw* dât remains in suppression for seven days, in destruction seven days, and in appearance eight days.

3. The *Ta-zaw* dât continues in suppression for six days, in a state of disorganisation six days, and in appearance seven days.

4. The *Wah-yaw* dât remains in a state of suppression five days, in destruction six days, and in appearance six days.

5. The gall remains in a state of destruction for four days, and in appearance five days.

6. The foulness of the food in the stomach remains in a state of suppression for three days, in destruction three days, and in appearance four days.

7. The *Ah-ka-tha* dât is in a state of suppression for two days, in destruction two days, and in appearance three days.

[1] "Appearance" means that the action of the dât is in full play, and in a healthy condition.

8. The *Fiery* dât is suppressed only for one day, disorganised for one day, and in full play for two days.

The particular days of the "appearance" of the dâts may be observed from the following:

1. The appearance of nine days of the *Pat-ta-wee* dât commences on a Sunday, and ends on Monday of the following week.

2. Of the eight days of the *Ah-baw* dât from Monday to Monday.

3. Of the seven days of the *Ta-zaw* dât from Tuesday to Monday following.

4. Of the six days of the *Wah-yaw* dât from Wednesday to Monday.

5. Of the five days of the *Gall* from Thursday to Monday.

6. Of the four days of the foulness of the food from Friday to Monday.

7. Of the three days of the *Ah-ka-tha* dât from Saturday to Monday.

8. Of the two days of the *Fiery* dât from Sunday to Monday.

In reference to the suppression and destruction of the dâts observe the following rules:

1. The *Pat-ta-wee* dât is destroyed for eight days, counting from a Sunday.

2. The *Ah-baw* dât seven days from Monday.

3. The *Ta-zaw* dât six days from Tuesday.

4. The *Wah-yaw* dât five days from Wednesday.

5. The *Gall* four days from Thursday.

6. The foulness of stomach three days from Friday.

7. The *Ah-ka-tha* dât two days from Saturday.

The *Fiery* dât one day, Sunday.

GENERAL REMARKS.

Disease occurring on a Sunday is caused by the earth dât, and Saturday is considered the day on which the patient was conceived, in which case there will be two crisis days during the week, viz., the fifth and sixth days respectively. If the disease does not abate on the twelfth or eighteenth day the malady becomes a long and protracted one, which generally proves fatal.

Diseases arising from changes in the weather or seasons, ought not to be treated early with medicine, nor should the patient bathe even should he feel relieved on the twelfth day.

Disease occasioned by excess of phlegm

should be treated with sweet or sour diet in hot weather, with bitter or salt food in the rainy season, and with sweet and rich food in the cold weather. But reason should be the guide, and every intelligent doctor will use his own discretion in such cases.

Affections of the eyes, ears, nose, tongue, or any other part of the body may be caused by trouble and mental anxiety, from the changes of the seasons, or from taking food which disagrees with the constitution at an improper time. Therefore, before resorting to any mode of treatment the nature and cause of the disease should first be ascertained.

GENERAL DISEASES.

Lay-tha-lait, or windy phlegm.—The symptoms of this disease are shivering of the body (rigors) with alternations of heat and cold, itching and swelling. In those who have got too much blood, vomiting, hiccough, giddiness, and fulness of the chest are also present. When there is foulness in the breath indigestion follows, and in the most obstinate cases the head, face, and jaws, become distorted when the patient bends to one side, and his sufferings are ended by sudden death.

Thway-tha-lait, or bloody phlegm.—Symptoms—Spitting of blood and galleous matter, after which the patient becomes weak, and feels drowsy and faint.

Thai-gyee-tha-lait, or galleous phlegm, of which there are five kinds. In the most severe cases the patient becomes either too talkative or too silent. When he talks he speaks incoherently, does not remember anything that has been told him, nor is he able to distinguish night from day, and the body, moreover, swells. This disease is often attended with epileptic fits.

Ngau, or the venomous influence on certain diseases. There are three kinds of *Ngau* generally attendant on fever, ague, and mee yat, which are caused by changes in the weather, and on boils, pimples, erysipelas, and venereal eruptions, which are caused by disorder of the gall. The first kind of *Ngau* called the bloody Ngau, continues for three days, the second, windy Ngau, for four days; the third, galleous Ngau, for five days.

On the third, seventh, or twelfth day after the first attack of any of the said kinds of Ngau, the patient either dies or is relieved. In other cases the cure may be delayed to the twenty-seventh or thirty-

second day, when, if he does not die, he recovers slowly.

Fever attended with looseness of the bowels, if not relieved on the third or sixth day, will generally continue for a long time.

When the fever disappears, or is driven internally suddenly, the descending blood is out of order, and if it reappears great caution should be exercised in watching the change, by not giving any remedy in too great a hurry. The looseness is caused by the discharge of the water dât, and this causes disorganisation of the dât and the blood which brings on lowness of spirits. The countenance then becomes pale, the tongue sore and rough, the limbs stiffen, and the whole body becomes insensible to the touch. In such cases, purgatives should on no account be given lest they hasten death.

Nghat Phyah, or ague, is caused by residence in cold and moist localities, and in hilly and mild regions; and when not checked in time, or within twelve days from the commencement, will stop the motions of the bowels, and cause suppression of urine; under which circumstances, medicine should be administered very sparingly. Under unskillful treatment the patient will, after long and protracted suffering, die, or he may, on

account of the heat in the system, have secondary diseases such as Doolah (asthma), cough, and spitting of phlegm, which will be found to be incurable unless the dât system of treatment be resorted to.

Bloody Doolah is caused by the blood when it comes in contact with the wind, and *Windy Doolah* by the wind and taking putrid food, which is a secondary disease.

In some cases when the blood is roused by the internal heat, a "little tongue" with many thorny sores appears under the ordinary one, and then a discharge of blood from the nose sets in, and when this occurs through a collision of air and water in the heart, the patient should only partake of a cooling diet, avoiding all things that are bitter and hot. When swelling of the body takes place, which is caused by an overflowing of the windy bile and disorganisation of the *Ah-ka-tha* dât, the patient should avoid sweet and rich food, and take only those things that are salt, acid, hot, and spicy.

Tounghoo-Nah, or Tounghoo distemper, an itchy disease and species of leprosy—caused by an excess of the windy bile—and peculiar to the district of Tounghoo, is a disease which is curable, but the *Tha-min-yet* (Deer licked disease) or true leprosy, is incurable,

and any one who discovers a remedy for it may consider himself a fortunate man, for it has never yet been cured by any one.

Kyouk (a stone) or small-pox, is called the inevitable disease, or "unavoidable disease," from its being rooted in the human body from the time of birth, is occasioned by different causes:

1. By the earth dât; 2, by the water dât; 3, by the wind dât; 4, by the fire dât; 5, by the *Ah-ka-tha* dât; 6, by excess of the gall; and 7, by superfluity of blood.

The seven kinds of small-pox which are generally considered dangerous are: 1. *Kyouk-tha-rae;* 2. *Kyouk-tin-kat;* 3. *Kyouk-mee-au*; 4. *Kyouk-khyeen-yah-nee-gyee;* 5. *Kyouk-pah-gat;* 6. *Kyouk-tha-bya*; and 7. *Kyouk-mwai-ngai.*

1. The *Kyouk-tha-rae* on its first appearance much resembles prickly heat, especially about the arms and abdomen.

2. *Kyouk-tin-kat* generally makes its appearance in groups of three or four pustules, with flat tops containing very little matter, and patients affected with this kind of small-pox generally die on the tenth, thirteenth, or fourteenth day from its first appearance.

3. *Kyouk-mee-au* shows itself on the

breast and belly like a scalding about the fourth day, and the patient will surely die on the ninth or tenth day.

4. *Kyouk-khyeen-yah-nee-gyee* consists of a red and flat eruption, which causes very much itching of the body on the seventh or eighth day, and is also very fatal.

5. *Kyouk-pah-gat* makes its appearance first upon the legs, the tops of the pustules of which are hollow, and under which the matter is secreted, and generally proves fatal on the twelfth or fourteenth day.

6. The *Kyouk-tha-bya* presents itself as a red or reddish-brown eruption, remarkably like the *Kyouk-tah-gyeen, Kyouk-tah-zac, Kyouk-sau-gyee,* and *Kyouk-sau-doe,* from which it can scarcely be recognised, except by the most careful examination, and is also a very grave disorder.

7. *Kyouk-mwai-ugai* changes the complexion into an ashy colour after the third day, and on the seventh or eighth there is great itching of the body, after which the patient assumes an unmeaning look (vacant stare), and talks incoherently in his sleep.

Of the other varieties the *Kyouk-agghee-zone-nah* is considered almost incurable. It comes out principally upon the face, and

presents the appearance of having been caused by a blow.

Kyouk-tha-dah, or coral pox, resembles red coral very much in colour. Its pustules are of a rounded shape with flattened tops, and when seven of them make their appearance they are quite enough to kill any patient.

Kyouk-nee-lah has also got red and flat circular pustules coming out in threes, each set forming the points of a triangle. *Kyouk-mwai* and *Kyouk-ta-thwa* are of a dull colour, and contain thick matter in the pustules,—the former being triangular, the latter in circular patches. *Kyouk-tha-dah*, *Kyouk-nee-lah*, *Kyouk-khgeen-yah*, and *Kyouk-nau-kat*, contain in their pustules black and thin matter. In the last named pox the eruption makes its appearance more upon the upper than the lower portion of the body. On the tenth or eleventh day the motions of the bowels stop, and if proper precautions are not taken in time, the patient dies.

Kyouk-moe-uhan is round like the beautiful fruit of the *moe-uhan* tree.

Kyouk-tha-lai is conical, like the seed of the pomegranate whose name it indicates. *Kyouk-bee-zat* has got exactly the shape of the *bee-zat* seed (*spilanthus acmella*).

Small-pox occasioned by the water dât

makes the patient restless, that is sit often and stand often, and he frequently passes blood with the stool.

That which is caused by the wind dât makes the patient look thin, yellow, and pale. He feels great heat and pain in his head and sides; the sight becomes weak, and the limbs benumbed.

That which is caused by the fire dât makes the patient roll from side to side; feel thirsty, with a strong beating pulse, the sleep is uneasy, the face swells, the eyes open and close frequently, the mind wanders, and the stools are accompanied with black matter. When these cease, the pox turns inwardly, while the patient becomes delirious, and death follows in a very short time.[1]

Diarrhœa and Dysentery.[2]—*Thway-tek,* or the ascending, strong, and quick circulation, and *Thway thet,* or the descending, weak, and slow circulation of the blood, are generally known by the beating of the pulse.

[1] Inoculation with the small-pox virus has been practised by the Burmese from time immemorial. The usual procedure being to mix it with milk and insert it under the skin of the arm. In 1868 the author was informed by a native doctor that in all his experience he had only seen twelve deaths result from inoculation.

[2] The term "looseness" applies both to diarrhœa and dysentery according to Burmese nosology.

Looseness (diarrhœa) is generally caused by the *Thway-thek*, and the most suitable food is beef or prawns, with the leaves of the *Pei-loon* (a species of pea). If the motions of the bowels cannot be stopped by these means, the cause of obstinacy may be attributed to irregular changes of the seasons.

A person suffering from costiveness should take food that would bring on the *Thuay-thek*. Any disorder of the bowels in persons labouring under small-pox may be caused by improper food, by excessive sexual intercourse, and by the "unlucky days" called "*yaw-gundah*," on which no human aid can be of any service. Diarrhœa and dysentery (looseness) may be divided into four different kinds, viz., slimy, bloody, biliary, and putrid. The colour of the motions in the slimy variety is white, and smells like vinegar, for which a sweet diet may be recommended. In the bloody kind the colour is red, and the most suitable diet is beef soup. When the looseness is caused by biliary matter the colour is green, and the patient generally feels tightness in the chest. The best kind of food for this form is anything that is sweet.

In putrid diarrhœa the colour is brown and very offensive. This can best be remedied by astringent, sweet, and rich food.

The disorganisation of the earth dât is caused by the irregularity of the bowels, which is known by frequent changes in the colour of the motions. If the colour becomes bluish black, the last moments of the patient are fast approaching.

In order to consolidate and restore the several disorganised dâts or elements, the food should be, of a suitable quality, sweet and relishing food for the earth dât, salt diet for the wind dât, bitter and hot for the fiery dât, cooling for the water dât, and acid and sweet food for the galleous dât.

To stop the looseness caused by the *Thway-thet*, or descending blood, beef, mutton, the flesh of the porcupine, and that of the deer should be given, and if these articles do not produce the desired effect, the flesh of the buffaloe should be superadded for the purpose of exciting the water dât.

THOO-NGAI-NAH, OR DISEASES PECULIAR TO CHILDREN.

Regarding the heat which is in a newly born infant, and which causes what is called the children's disease. An infant is liable to disease because of the heat absorbed from its mother, which was imparted to its system

while it was yet in its mother's womb. If, under these circumstances, the child be bathed in cold water to cool that heat, the external heat is driven internally,[1] and prevents the child from sucking. It becomes very restless and rolls from side to side, the dirt and tears flow from the eyes, and the head stoops from weakness in the neck, and the belly becomes bloated. On the appearance of these symptoms some doctors resort to artifice, and declare that the child is possessed of a nat or evil spirit, and will rub into the child's body different coloured medicines dissolved in vinegar, and some give a similar mixture, diluted with water, internally.

Whenever a suckling infant is ailing medicines should be given only to the mother, for, as the ailment is caused by the heat contracted from the mother, it can be removed only through her milk. The cold water bath should always be avoided in these cases, and by these means the child may recover in one, two, three or four months, and even in the most obstinate cases it will not continue more than twelve or eighteen months, when it is bound to recover.

To an infant who becomes ill from inhaling the smell arising from anything cooked, burnt,

[1] Not far from what modern physiology teaches.

or fried,[1] medicine should not be given immediately, because such a case will recover on the fifth day.

When a woman in a state of pregnancy goes about exposing herself to heat and cold and wet, or is careless in her diet, the child will be diseased when born, and will generally die on the sixth or seventh day. If the child should survive beyond that date, and if the mother is still careless in her diet by eating hot and sour things, the disease, born with the child, will become incurable, and in many cases will end in deformity. Children born prematurely are generally sickly.

The earth dât in human bodies goes on increasing gradually up to fifty years of age, when it decreases in a similar manner. Children under ten years of age, and adults who have arrived at the age of infirmity (*i.e.*, fifty years), when ill should never be treated with hot medicine, nor dieted with hot food. They should have mild medicine, and rich and nourishing food. Patients between the ages of ten and fifty many take hot medicine and hot food in moderation.

[1] Rice and other cakes fried in oil are considered a great luxury by the Burmese, also a horrible preparation of fish, in a state of decomposition, called "*Gnapee*," which is administered under almost any circumstances.

To patients above ninety[1] years of age no medicine whatever should be administered, delicate food of a rich and nourishing kind only should be given to them. This is fully explained in the book called *Dar-Too-Ba-Dah-Duah-Drah-Thee!*[2]

DISEASES OF WOMEN.

Before arriving at the age of puberty, and after child bearing, women have no catamenia. A woman's life, therefore, consists of three periods, the first extending from the time of birth to the commencement of the menses, called the age of infancy or childhood; the second from the beginning to the cessation of the menses, called the age of puberty or womanhood; and the third from the cessation of the menses to the termination of life, called the age of infirmity.

At the changes, either from the first to the second period, or from the second to the third period, women have the water dât in excess in their systems; but between the second and third periods, the age of womanhood, the firey dât is in the ascendant, under

[1] Showing that longevity is not barred by a tropical climate and expectant medical treatment.

[2] The author has had no opportunity of consulting this formidable work.

these circumstances they often feel feverish, weary or dull, loose their appetite, and look pale and dry. When they have the windy dât in excess their bodies become spotted in a great variety of ways. In such cases food that is bitter or salt or acid is most agreeable to them.

When the earth dât is gradually undermined in them by any of the other three dâts, their diet should be rich to restore it, and when the blood dât is in excess their bodies swell, then all rich and sweet food should be avoided, taking only those things which are hot.

In cold weather, when a woman gives birth to a child, and if the heat of her body is driven internally on account of the water dât overspreading the whole system, a skilful doctor will try to extract the heat and put the gall into proper order. He will also order a large fire to be placed near her, and will give her ginger and pepper with her food; but this treatment should not be resorted to in hot weather or in hot countries; and if, under these circumstances, a patient dies the relatives must be consoled by informing them that the deceased was subjected to the will of her mysterious fate.

In the above meagre description of the

diseases of women no mention is even made of midwifery proper, consequently it may be reasonably inferred that every bad case requiring operative interference among the Burmese must perish, and that this has been going on for more than two thousand years cannot be questioned; moreover, it is not the less interesting to contemplate that the same state of things may go on yet for an indefinite period in many parts of the East, independent of the advance of Western civilisation. When a European does see any midwifery cases they are generally of the most desperate character, and under the most unfavourable circumstances. The Burmese, however, differ much from the Hindoos in one essential respect as regards the treatment of diseases by Western savans. According to their religious belief, when a woman dies in childbed she is considered unclean, consequently cannot enter into the state of neiban, or total annihilation (the Heaven of the Burmese), so that there is an inducement to seek the aid of Europeans whom they know by experience to be capable of doing what they cannot do themselves, especially when their own nostrums fail in affording relief. I have seen cases under such circumstances, and with the thermometer standing at 90° Fahr. in

the shade, a serious operation entails a considerable amount of inconvenience, both on account of the sudorific loss and disadvantage of rendering assistance without assistance, upon a floor of bamboo matting without the the aid of those essential adjuncts, a bed or a table. The obvious cause of neglect on the part of the Burmese physicians of this subject lies in the fact that women are considered to be beings inferior to men, and as among all semi-civilised communities, hold a subordinate position, hence it would be altogether undignified on the part of men to make a special study of their diseases.

The difficulty of the subject is also a bar to any systematic arrangement of their ailments.

The same neglect appears to pervade the domain of surgery in general, for beyond the applications of cataplasms of rice poultices,[1] plantain leaves, and numerous other nostrums, no operation has ever been attempted more serious than the boring of the ears of young maidens for holding long and clumsy thimble-shaped earrings.[2]

[1] One of the favourite poultices with the Hindoos is cow dung, and the urine of the same animal is also often used as an internal remedy.

[2] In 1869 the King of Upper Burma spent about L.30,000 when one of the princes' ears were bored.

Ignorance and incapacity are of course sufficient to account for this state of matters, and we have only to look a little nearer home to find a parallel instance.

When medicine and surgery were first separated from each other by the Arabian school, about the middle of the twelfth century, the practice of surgery was denounced by the Council of Tours as being undignified and derogatory to the sacred office of the priesthood, and beneath the notice of men of learning, the term chirurgery (from χειξ, the hand, and εξγον work), therefore sufficiently demonstrated that its practice consisted of manual procedures independent of the dignity of learning; and its practitioners dwindled down into mere mechanics. It was not so, however, in the beginning. From the earliest notice of our art, according to the ancient Greeks and Egyptians, medicine and surgery were one and indivisible, but when priestcraft and philosophy undertook to explain the mysteries of nature, surgery became of secondary importance.

The love of mystery which has at all times pervaded the human mind, encouraged this separation, for it is obvious that a pretended acquaintance with those things which are not seen should produce a greater effect

upon the minds of the ignorant than the most skilful manipulations of a practical art.

Though now-a-days most intelligent men are agreed that the science of medicine and surgery combine to constitute one great art, I am not sure but there is still a hankering after the mysterious, even in the minds of some scientific men; and certainly the public still look upon the training for the department of medicine as being of a higher order than that necessary for the practical surgeon; fostered no doubt by the profession, who have created an endless confusion through a multiplicity of medical and surgical qualifications, which appear, in virtue, to depend as much upon geographical distribution as to intrinsic merit.

To those responsible for this absurd and useless state of medical learning, or rather the means by which it is acquired, may well be applied the lines—

"What's a' your jargon o' your schools,
Your Latin names for horns and stools;
If honest nature made you fools,
What sairs your grammars?
Ye'd better ta'en up spades and shools,
Or knappin'-hammers.

"A set o' dull conceited hashes,
Confuse their brains in college classes!
They gang in stirks, and come out asses,

Plain truth to speak;
And syne they think to climb Parnassus
By dint o' Greek."—BURNS.

THE CHINESE SYSTEM OF MEDICINE.

Before leaving the Asiatic continent a few words on the notions of medicine which exist among the Chinese, Japanese, and Hindoos, may not here be out of place. Regarding the early history of the Chinese, little or nothing is known. The first notice of them, which we possess, was communicated in the thirteenth century. "It is said by Le Compte, in his 'Memories Sur l'Etat présent de la Chine,' that Hoang-ti composed, 4000 years ago, the code by which the Chinese physicians have been until recently, and may at the present day, be guided. According to the testimony, however, of the best informed Mandarins, this code was not substituted for the ancient, until after the burning of a considerable library in China, which occurred 230 years before the Christian era."

Isolated as the Chinese have always been from other nations, it is not to be supposed that much can be learned from them. The rude notions which they did possess were probably the remnants of old traditions

handed down from the Greek physicians of Bactriana, their religious superstition not permitting them to dissect human bodies. The constituent elements of the body, according to them, consist of two elements, viz., heat and moisture. These elements reside in the blood and in the vital spirits, their union constituting life, and their separation death. The moisture exists in six different parts: on the left side, in the heart, the liver, and the left kidney; on the right side, in the lungs, the spleen, and the right kidney; and the vital heat which exists in the viscera is confined—on the left side, to the small intestines, the gall bladder, and the ureters; on the right side, to the large intestines, the stomach, and the genital organs. The concordance which exists between the viscera they classify as follows: The small intestines are in harmony with the heart, the gall bladder with the liver, the ureters with the kidneys, the large intestines with the lungs, the stomach with the spleen, and the generative organs with the right kidney.

The vital heat and radical moisture of the body pass at certain periods into the viscera from the limbs and *vice versa*. Diseases are supposed to be cured by the action of external agents upon the vital economy. In

the summer the heat acts upon the heart and large intestines; the viscera being in harmony with the south; the liver and gall bladder with the atmosphere; and both with the east, as well as the spring—that the metals act upon the lungs and large intestines, being in harmony with the west, and with the autumn. According to Cleyer, the Chinese physicians consider that the circulation of the vital heat and radical moisture begin at three o'clock in the morning, commencing in the lungs and terminating, at the end of twenty-four hours, in the liver. The number of pulsations in twenty-four hours amounts to between 54,000 to 67,000, while the number of respirations in the same time is about 35,000, the pulsations being estimated at no more than twice the number of respirations.

The basis upon which Chinese medicine rests is the state of the pulse. From it they not only discover the seat, but also the causes of diseases.

The human body is by them compared to a musical instrument, conceiving that a certain accordance exists between its different parts and the viscera, and that by feeling the pulse and inspecting the eyes and pulse, they may be able to discover what is going on in

the system. In exploring the pulse four fingers are placed upon the artery, raising and depressing them alternately as if they were playing upon a musical instrument.

In diseases of the heart they trust entirely to the state of the pulse of the left arm, and in diseases of the liver, to the pulse of the left arm also, but a little higher up than the situation where heart diseases are diagnosed.

In diseases of the stomach the pulse is felt in the right arm. At the wrist in those of the lungs, and above the wrist joint in those of the kidneys.

The different places where the pulse may be felt as an index of disease are as follows: The nearest to the hand in affections of the heart and pericardium, on the left side. On the right side in the same position for diseases of the lungs. The highest position on the left side in diseases of the left kidney and small intestines, and the highest on the right side in diseases of the right kidney and large intestines. Between the two on the left side for diseases of the stomach and spleen, and in the same position on the right side for diseases of the liver and diaphragon.

"The physicians of the Court of Pekin attributed the greater part of diseases to spirits or winds, and dysentery to want of

heat in the fluids." Du Halde, in quoting from an old Chinese book on botany, described the virtues of many simple and compound medicines mixed up with the grossest superstition.

The absence of stone and gout among the Chinese have been attributed to the use of tea, but it is more likely that these diseases were not recognised when they did exist.

In the northern provinces of China the moxa has always been a favourite remedy in diseases. These moxas were prepared from the dried leaves of the *Artemisia vulgaris latifolia*, or *Artemisia Chinensis*, a species of mugwort. The mode of applying this consists in making deep punctures in the body with gold, silver or steel needles, without drawing much blood, and inserting small balls of the down of the artemisia, which are set fire to, requiring the utmost skill on the part of the physician in determining the depth and number of punctures in each instance.

According to the Abbé Grosier every kind of fire was not proper for lighting these balls, " mirrors of ice or metal were employed, which caused the water to freeze in a round convex vessel, and the ice being presented to

the sun collected its rays and set fire to the down of the plant."

The system of medicine among the Japanese is very similar to that of the Chinese, from whom they borrowed most of their principles.

Ten Rhyne asserts that acupuncturation became a special art among the Japanese, and that the houses of the physicians "were known by the wooden image of a man in the vestibule, on which the places for acupuncturation and the application of the moxa were delineated."

Their belief in the colour of red being a favourable sign in small pox cannot be well explained, and so great is their faith in this idea that they line the chambers of those labouring under small pox with red cloth, and their magicians are said to cure diseases by "placing before their idols the description in writing of particular characters of the affection under which the patient laboured, making the paper afterwards into pills," which they induce their patients to swallow.

The principles of medicine among the Hindoos[1] are no less complex and absurd.

[1] The "Ayur Veda" appears to be the most ancient of the Hindu sacerdotal medical writings. Its date has been fixed at not later than the fourteenth century before Christ, that

The human body, according to them, is composed of 100,000 parts, in which are comprised 17,000 vessels, each of which has got seven different canals, in which are ten species of wind. Diseases are produced by the irregular directions of these winds, the air which enters the lungs during the act of respiration being the source of all the winds, and the best preventive of these disorders is not to breath too quickly. "According to the memoirs of the Danish missionaries there were some Gentoos who reckoned 4448 different species of diseases."

The Hindoo physicians are not altogether devoid of medical knowledge, and, like the Burmese, sugar in some form enters largely into the ingredients necessary for the cure of most diseases.

The Brahmins, or priest caste, transmit their

is about 900 years anterior to Hippocrates; but it appears to have been nothing more than a summary by professional writers of still more ancient medical doctrines. The Hindu philosophers, who lived subsequent to this work, the *Vidya*, were termed *Rishis*, a college of commentators on the "Ayur Veda," and peripatetic lecturers on medicine. The "Charaka," an ancient Cyclopædia of Medicine, was written by one of the Rishis, in the form of a dialogue.

Another ancient standard work of this kind is the "Susruta," also a Commentary on the "Ayur Veda," but treats more especially of surgery.

See article Medicine, in the eighth edition of the Encyclopædia Britannica, by the late Thomas Laycock, M.D.

medical knowledge to their children, such as they had received it from their parents, with a wholesome admixture of superstition, as is well exemplified in their treatment of cases of poisoning by the bites of venomous snakes. In this class of cases oil is poured into a vessel containing the urine of the person bitten, and according as it may swim on the surface, or be precipitated, the recovery or death of the patient may be prognosticated.

A favourite remedy in intermittent fever, and, indeed, in most chronic disorders, is the drinking of cow's urine, and the application of a cataplasm of cow dung.[1]

Though possessed of an extensive materia medica, the use of such an agent as dog's bones powdered as an injection in gonorrhœa is of frequent occurrence. The virtues of cubebs and copaiba in the same disease are also well known to them, which is probably a recent addition to their medical armamentaria,[2] and it is no uncommon thing for the native physicians (Hakims) to have twenty or thirty different ingredients mixed up in a single pill.

[1] The Brahminy cow being a sacred animal, immense virtues are attributed to its excreta as therapeutic agents in all cases of difficulty.

[2] Mercury in some form is also frequently administered in venereal diseases.

Numberless remedies can be procured from the bazaars for most complaints, and certainly in ringworm amongst others, the goa-powder appears to possess medicinal virtues of singular value in this disease.

Evil genii are the causes of many diseases, which can only be cured by purification and the use of magic words. The aspect of the stars and the flight of birds are looked to for the purpose of prognosticating future events; and certain it is that, prior to the time of Alexander the Great, they had made numerous astronomical observations, and long before they had any intercourse with Greece. All diseases of the skin they attribute to worms, and other diseases to wind, vertigo, and change of humours. Regimen enters largely into the Hindoo system of medicine, most of them living upon a vegetable diet, which had been noticed by Strabo and Suidas. They make wonderful recoveries after surgical operations. In worms they have used lime water and the dolichos pruriens, with the juice of euphorbium and maize flour made into pills; rice in cholera morbus; sand baths in beriberi; opening of the lingual veins in angina and other affections; caustics in bone fever and cholora; scarification of the eyelids, and incisions in the forehead in

ophthalmia; and a rigid diet, and sometimes blood letting in acute fevers. The pulse and the countenance (the latter too much neglected by us now-a-days) have always been attentively studied by them, as any change in the pulse is supposed to influence the state of the expression. In the small pox an antiphlogistic regimen, according to the constitution of the patient, is adopted, and, according to Macintosh, they possess a secret ointment by which the scars of that disease can be removed. The so called arcana against the bites of serpents are a myth. I have seen several of them tried at their best, and like our own favourite remedy, eau-de-luce, not only signally fail, but prove entirely and utterly useless.[1]

MEDICINE OF THE CELTS OR DRUIDS.

The Celts originally included the Gauls and the Belgæ. "The former lived at first in France between the Seine and Garonne, but subsequently crossed into England, and were replaced by the Belgæ, who had pre-

[1] For further information respecting the system of medicine among the Hindoos consult Dr Wise's elaborate history of Medicine among the Asiatics, in which, strange to say, there is no mention of the Burmese system.

viously resided between the Loire and the Rhine," the learned amongst whom were called Druids. These latter were the judges, legislators, priests, physicians, and divines, and were subsequently divided into three classes, viz.—the Druidi or Druids, who were the legislators; the Eubages, or those who studied nature; and the Bardi or Bards, who confined themselves to poetry and history.[1]

It is supposed that they possessed some knowledge of anatomy "derived from the long course of human sacrifices which they made." The most probable view, however, is that they knew nothing at all of anatomy, or of anything else, save an elaborate system of imposition by which they freed themselves from authority by pretending to hold communication with the gods.

Their surgery consisted of setting fractures, reducing dislocations, and healing wounds in the rudest fashion, and resorting to spells, charms, and incantations to suit their convenience and enhance their importance. In this they were supported by their wives, who resorted to witchcraft, whose assistance was frequently implored by women in childbed.

Their materia-medica consisted of the

[1] Dunglison and Meryon's Histories of Medicine.

juice and decoction of herbs. Their religious ceremonies being celebrated under the oak, they attributed to the mistletoe (a sacred plant amongst them) the virtue of curing all diseases. The selago (a kind of hedge-hyssop) and vervain were also highly prized by them, the latter being always gathered at the rising of the star Sirius, the time of collection being preceded by mystical and absurd ceremonies, amongst which were the wearing of a white garment, offering a sacrifice of bread and wine, covering the right hand with the skirt of the robe, "and with a hook made of a more precious metal than iron" cut up the herb, and, placing it upon a clean cloth, imparted virtues to it which preserved the individual from all misfortunes and accidents.

SCYTHIANS.

On a par with the medicine of the Druids may be mentioned that of the Scythians, a race who dwelt in the south of Russia, from the shores of the Black Sea to Mount Oural. This nomadic nation was well known to the Greeks after the Trojan war, with whom they established commercial relations owing to the productiveness of their country, and to whom they imparted a certain degree of civilisation.

The most famous amongst them according to Greek traditions were *Abaris the Hyperborean,* who, in the capacity of a priest, undertook a journey to Delphi, and cured several patients by means of magic charms, and is said not only to have built the temple of κόρη σώτσιρα at Lacedæmon, but also to have arrested a plague which devastated that city.

Anacharsis, another Scythian, is said to have travelled into Greece in the time of Solon, and to have instructed his countrymen on his return in the treatment of acute diseases by hygienic means, as well as the most approved methods of appeasing the wrath of the gods; and to have rendered himself famous by his wisdom and exemplary moral behaviour.

Toxaris likewise acquired a great reputation in Athens, whither he had repaired in the company of Anacharsis, the traveller, and distinguished himself as a medical practitioner after having become one of the Asclepiadæ.

Tradition records that he arrested a plague after his death, by appearing to the wife of one of the members of the Areopagus, for which service the Athenians in their gratitude erected an altar to him, on which a white horse was annually sacrificed.

PART II.

HISTORICAL SKETCH

OF THE

PROGRESS OF MEDICINE

TO THE END OF THE EIGHTEENTH CENTURY.

HISTORICAL SKETCH OF THE PROGRESS OF MEDICINE TO THE END OF THE EIGHTEENTH CENTURY.

AS the notions of medicine among the Asiatics can scarcely be termed progress, the following brief sketch of the advance of medicine from the earliest times may not be unacceptable to those who take an interest in such matters. It is not my intention, however, to enter at any great length into all the uncertainty of the various histories which have been handed down to us from remote ages, only to depict in miniature the salient points in connection with the labours of those who have contributed to the improvement and advancement of our noble art, and in a manner to refresh the memories of those who have neither time nor opportunities for fishing all these facts for themselves out of a heterogeneous labyrinth of historical literature. At the same time, there is a great charm about the ancients and their literature, and without being altogether an

antiquarian, or a profound classical scholar, an hour with the Greek and Latin authors well repays perusal.

That medicine, or some attempt at it, is as old as man, need not here be doubted or proved; suffice it to say, that the earliest accounts of it are to be found in the Mosaic writings. "In the thirteenth chapter of Leviticus there is mention of the laws and tokens by which the priest physicians may be guided in diagnosing the disease called leprosy, and in verses 24th and 25th will be found certain aids to the diagnosis of that formidable malady, which appears in those days to have assumed the character of an erythematous rash."

There is also frequent mention in the Old Testament of the operation of circumcision as practised by the Jews, and no doubt the ancient Greeks derived their knowledge of the Arts and Sciences, as well as medicine, from the Egyptians, who considered medicine to be of Divine origin, and its professors to have been either gods, or the sons of gods.[1]

"There is reason, however, to suppose that

[1] The Egyptians appear to have attributed peculiar medical powers to the Deity Isis, the wife and sister of Osiris, who gave proof of her power in restoring her son Orus to life. Squill and oxide of iron were known to them as therapeutic agents of great value.

they were more conversant with surgery than is generally admitted. On the ruined walls of the renowned temples of ancient Thebes, basso-relievos have been found displaying surgical operations and instruments not very different from some in use in modern times, while their medical practice was founded upon incantation and astrology. They divided the body into thirty-six different parts, believing in an equal number of demons, to whom those parts were entrusted, and to invoke whose aid in sickness was the principal duty of the physician, each spirit being called upon to cure his own peculiar portion; thus showing that in those days surgery was of more importance than its twin sister medicine."[1]

In the time of Joseph it was customary to embalm the dead, and, according to Herodotus,[2] so soon as an individual was dead the embalmers repaired to the house of his relatives and showed them different

[1] See Historical Notice of Surgery in the "Encyclopædia Britannica," of which free use has been made in these pages. Also Chambers's "Encyclopædia," and other acknowledged sources.

[2] *Diodorus* describes the process of embalming in a similar manner, and mentions the means by which the dead body might be preserved in the form which the individual had during life.

coffins of painted wood of the shape of a mummy.

The first were of very exquisite workmanship, the second, less beautiful and costly, and the third, were still more moderate. In Dunglison's excellent and concise History of Medicine the process or operation of embalming is briefly described as follows: The brain was first drawn through the nose by means of an iron crotchet, or hook, and aromatics and spices were then pushed into the cranium. The abdomen was opened by a sharp Ethiopian stone; the intestines were removed, and the abdominal cavity cleaned out, and then washed with palm wine, and spicy substances dissolved in water poured into it. It was subsequently filled with myrrh, cassia, and other aromatics, and the integuments were brought together. The body was now washed with a solution of salt, and suffered to remain at rest for seventy days, but not longer. At the expiration of this time it was again washed and covered everywhere with a gum, which the Egyptians used in the place of size, and enveloped in a linen cloth. The relations then took the body, enclosed it in a wooden cradle, modelled after its form, and deposited it in the catacombs."

In the case of those who could not afford the more elaborate process of embalming, they were content with injecting liquid resin through a tube into the abdomen without opening it, the body being afterwards treated with the solution of salt for seventy days, after which, the resin and the viscera were removed, leaving nothing but the skin and bones.

The last and cheapest mode, for the very poor, consisted of cleaning out the dead body and macerating it for seventy days in a solution of salt.

In the case of women of high birth, or unusual beauty, according to Herodotus, their bodies were not submitted to the embalmers for three or four days after death, owing to the circumstance that some of the *pastophori* had been known to violate the dead persons of such females. Strange to say that though the practice of embalming was common among the Egyptians, when the holy functionary or scribe "marked on the left side of the body the place where the incision should be made," the *parachistes*, or operator, after making the incision hastily withdrew, "from a dread of being assailed with imprecations, and even with stones, by the assistants, so great was their horror at any one who dared to inflict

an injury, by means of a cutting instrument, on the remains of a friend."

12th Century B.C. *Chiron*, the first authority in surgery.

Chiron, the centaur, born in Thessaly, was celebrated for his skill in applying soothing herbs to wounds and injuries of different kinds, but his fame was eclipsed by that of Æsculapius, son of Apollo, by some, said to have been a pupil of Chiron, by others, to have preceded him. Previous to the time of Æsculapius, however, all accounts are entirely legendary, and indeed his very existence has been questioned, but on what grounds I do not at present mean to enter. About fifty years before the Trojan war, Æsculapius is supposed to have been deified on account of his medical skill, and, according to the testimony of Celsus, in the following passage from the preface to his first book "De Medicinæ re," he was also considered the most ancient authority in medicine. "Veruntamen apud Graccos aliquantò magis, quàm in cæteris nationibus, excultu est: ac ne apud hos quidem a primâ origine, sed paucis ante nos seculis; utpote cum vetustissimus auctor Æsculapius celebretur. Qui quoniam ad huc rudem et vulgarem hunc scientium paulo subtilius excoluit, in Deorum numerum receptus est."

About 1142 B.C. *Æsculapius*, the God of Physic, and the most ancient authority in Medicine.

Apollo was the original God of Physic among the Greeks, but he is said to have re-

signed in favour of Æsculapius whose temples became seats of learning in medicine and surgery, especially those of Epidaurus, Cnidos, Cos, and Pergamus. Homer represents Æsculapius as a famous physician of human origin and god of the healing art. The stories of his genealogy vary very much. According to one account he was the son of Coronis and the Archadian Ischys. Apollo, enraged by the infidelity of Coronis, caused her to be put to death by Diana, but spared her son, who was afterwards educated by Chiron, but he soon surpassed his master, and succeeded in restoring the dead to life, which offended Pluto, who began to fear that his region might be insufficiently peopled, and sought the assistance of Jove, by whom Æsculapius was slain by a flash of lightning. After his death he was raised to the rank of the gods by the gratitude of mankind, and was worshipped at Epidaurus, on the coast of Laconica, where a temple and grove were consecrated to him.[1]

[1] "Festivals, called Asclepia, were celebrated to his memory at Epidaurus, Pergamus, Athens, and Smyrna, and priests were set apart, under the denomination of Asclapiades, to preside over the rites and ceremonies of his altars. Temples were built in the most healthy places that could be chosen, and, when practicable, in the neighbourhood of some mineral spring;" and these were ornamented with votive

Homer, moreover, states that he left two sons, Machaon and Podalirius, who, as physicians, or rather as surgeons, attended the Greek army, and from whom the race of the Asclapiades were descended.

Having followed Agamemnon in the Trojan war, 1192 B.C., their services were so highly valued that their names have been immortalised amongst the heroes of the Iliad.

About 1192 B.C. *Machaon*, son of Æsculapius, and famous for his treatment of wounds in times of war.

Machaon seems to have been the most distinguished of the two, for, when he was wounded by Paris, the whole army was interested in his recovery. "Even the stern Achilles inquires anxiously after the wounded offspring of the healing god;" and Nestor is equally concerned, "for a leech who, like him, knows how to cut out darts, and relieve the smarting of wounds by soothing unguents, is to armies more in value than many other heroes."

1192 B.C. *Podalirius*, the originator of venesection.

Podalirius, though not so famous as his brother in extracting the missiles of war, was the first to practice phlebotomy, and evidently with marked success, for, having opened a vein in either arm of the daughter of Damoetas, king of Caria, who had been

tablets, on which were inscribed the diseases that had been successfully treated, and the remedies employed."—Meryon's "History of Medicine," p. 10.

injured by a fall from a housetop, was, after her recovery, rewarded by the hand of the fair princess, and was presented with the Chersonese as a dowry by her father.

These renowned brothers, however, could not have had any notion of physic, for on the breaking out of a pestilential epidemic in the Grecian camp, Homer at once applied to Apollo without consulting his learned leeches. He also adopted the same course in the cure of fractures of the bones, which shows that his medical heroes could only have been skilled in extracting darts and other weapons, and in applying styptics of the most rude nature to arrest hæmorrhage, with, probably, pressure and the application of soothing unguents.

The temples of Æsculapius generally stood upon hillsides outside the cities, in healthy localities, near fountains, and when patients were cured of their several diseases they offered a cock or a goat to the god,[1] and recorded the name, disease, and method of cure on a tablet hung inside the building.

Praxiteles and other sculptors represented the god as a type of manly beauty, resem-

[1] The author has known of professional fees at the present day not exceeding the offering of a fowl or a few eggs!

bling Jupiter, with hair thrown off the brow and hanging down in curls on either side, the upper part of the body being naked, and the lower part covered by a mantle hung gracefully from the shoulders. Sometimes with a laurel leaf upon the head, and a cock or an owl at his feet, or accompanied by a dwarf figure named *Telesphorus*.

For six hundred years after the Trojan war both medicine and surgery appear to have remained remarkably stationary, and their practice to have been confined entirely to the *Asclepiades*, the reputed descendants of Æsculapius, until an extraordinary impulse was given to them by the immortal Hippocrates himself, a branch of the family, and said to have been the fifteenth in lineal descent from Æsculapius. The Asclepiades enjoyed a monopoly of the mysteries of physic, and were in the habit of handing down their medical knowledge from father to son by oral teaching, and succeeded in establishing three medical schools—at Rhodes, Cnidos, and Cos, from the latter of which Hippocrates, who was destined to become one of the greatest medical philosophers that ever lived, was given to the world, thereby securing for it a lasting and enviable reputation.

12th Century B.C. The *Asclepiades*, descendants of Æsculapius.

About 570 B.C. *Pythagoras*, the first who assumed the title of philosopher, and discoverer of prop. 47 of Euclid, Book I.

Pythagoras, who was born about 570 B.C.,[1] was the first who brought philosophy to bear upon the art of medicine. He was a native of the island of Samos, and founder of the Italic school of philosophy. The date of his birth is uncertain, but most authorities are agreed that he lived in the time of *Polycrates* and *Tarquinius Superbus*, 540-510 B.C., and to have been a disciple of *Pherecydes* of Syros, of Thales, and Anaximander, and like many other illustrious Greeks to have travelled much in pursuit of knowledge during a period of thirty years to all the most important countries of Asia, Egypt and India.

It was probably from the Egyptian priests that he first imbibed the doctrine of *Metempsychosis*, or the transmission of souls into men and other animals, one of the famous tenets of the Pythagorean order or school, with peculiarities of diet and clothing, asceticism, and mystic rites.

He attributed magic virtues to certain plants, and believed that vinegar of squills possessed the property of prolonging life, that the cabbage possessed many virtues, and that aniseed was a specific against the bites of scorpions; mustard he also looked upon as a

[1] Meryon's "History of Medicine from the Earliest Ages."

"most penetrating remedy" in affections of the head, and useful in the bites of serpents and scorpions. His disciple *Alcmaeon*[1] is supposed to have been the first comparative anatomist who, according to Aristotle, affirmed that goats breathe through the ears, hence he is supposed by some to have been the discoverer of the eustachian tube, extending from the middle ear to the pharynx.

Though Pythagoras did nothing for medicine, yet in consideration of his having been the first to assume the title of philosopher (lover of wisdom), instead of the ancient name (Sophos wise), he deserves this passing mention. His career, though successful, so far as learning was concerned, was attended with political troubles which drove him into exile, where he died, at Metapontum, about 504 B.C. On returning from his travels he found so much tyranny established in his native island of Samos by Polycrates, that he abandoned the idea of settling in his own country, and eventually found a home in the city of Croton, in Southern Italy. It was here that he instituted the Pythagorean fraternity, the members of which were chosen after being subjected to the most rigorous tests of discipline. The mode of life of the

[1] *Alcmaeon* was the son of Pirithus.

order was regulated with the greatest minuteness. Temperance in all things was most rigidly enjoined, and the use of certain parts of animals and fish were prohibited. Beans were especially obnoxious from their supposed resemblance to one of the organs of generation.

He made several discoveries in music, astronomy and mathematics. In the latter branch it was he who first discovered the proposition known as forty-seventh of Euclid, Book I. The war which broke out between the cities of Croton[1] and Sybaris terminated about 510 B.C. in the complete overthrow of the Pythagorean order and destruction of Croton, during which disturbances he himself escaped to Metapontum, as already mentioned, where his tomb was shown in the time of Cicero.

500 B.C. *Anaxagoras*, the first who taught the distinction between mind and body.

Immediately succeeding we find *Anaxagoras*, about 500 years B.C., who was the first who taught the distinction between mind and body, a theory which was subsequently accepted by Democritus and his contemporary Empedocles.

[1] After the revolt of Croton, and the disruption of the Pythagorean sect, Metrodorus, 440 B.C., disclosed the secrets of the profession, and was thus instrumental in originating the public practice of medicine, which he himself taught.

494–404 B.C. *Democritus*, founder of an atomic system of philosophy.

About this period flourished the illustrious Greek philosopher *Democritus*,[1] who was born, according to some accounts, at Abdera, in Thrace, 470 or 460 B.C., and was considered one of the most profound thinkers of his age. But little is known of his life except that he turned his attention to medicine as a branch of philosophy, and established an atomic system of philosophy, and is also said to have lived on terms of friendship with Hippocrates, by whom he was much respected.

489 B.C. *Democedes*, a contemporary of Pythagoras, and famous surgeon who practised in Athens.

The school which was founded at Croton by Pythagoras produced *Democedes*, a contemporary whose skill appears to have been highly prized by the Athenians, as he seems to have practised with great distinction in that ancient cradle of philosophy.

He was presented by Polycrates, king of Samos, with two talents of gold annually for having cured him of a chronic and troublesome disorder. He was afterwards taken prisoner by the Persians, but he soon distinguished himself by curing their king, Darius, of a dislocated ankle, as also the queen, Atossa, of a cancer of the breast, and he was soon loaded with wealth and honours for having performed wonderful cures after

[1] Dunglison's "History of Medicine from the Earliest Ages," p. 101.

the Egyptian physicians in attendance had completely failed.

Democedes and the Asclepiadae must have had a very limited acquaintance with the diseases which they professed to treat, and could have attained little or no proficiency in surgery, for the touch of a dead body was prohibited as a profanation both by the Jews and the Greeks. Consequently, they could not possibly have acquired any knowledge of anatomy, which is the fundamental groundwork upon which both medicine and surgery are based. All their knowledge, therefore, must have been confined to the treatment of fractures and dislocations, removing foreign bodies, arresting hæmorrhage, and the employment of phlebotomy, scarification, cupping, etc. We are not informed whether they resorted to capital operations or not, but the probability is that they did not.

Unquestionably the most celebrated of all the ancient physicians, and him to whom the appellation of "the Father of Medicine" properly belongs, was the great *Hippocrates*, son of Heraclides, who was also a physician. Of distinguished parentage, both intellectually and physically — having been the nineteenth or fifteenth in descent, as already stated, from the family of the Asclepiades

460 B.C. *Hippocrates*, the most celebrated of the ancient physicians, originator of the clinical study and report of diseases, a voluminous writer on philosophical and medical sub-

jects, and the greatest benefactor of the medical profession, also a bold and distinguished surgeon, and originator of percussion and auscultation, and truly designated "the Father of Medicine."

on the one hand, and, through his mother (Phænarete), who is said to have been descended from Hercules on the other,—he must have been naturally endowed with all those qualities which combine to constitute the true genius.

He is said to have been born in the 80th Olympiad, in the Island of Cos, about 460 B.C., and to have been instructed in medicine by his father and Herodicus, of Selybria, in Thrace, and in philosophy by Gorgias, of Leontine, in Sicily, the celebrated sophist, and Democritus, of Abdera, in Thrace, whom he afterwards cured of insanity.

"After spending some time in travelling[1] through different parts of Greece, he settled and practised his profession at Cos, and finally died at Larissa, in Thessaly."

According to Clinton, the death of Hippocrates took place in 357 B.C., at the age of 104, but there are considerable discrepancies

[1] This practice of travelling before settling in practice by every one who aspires to rise to eminence is perhaps as rife at the present day as it was in the time of Hippocrates, and was carried to a great extent in the last century. No doubt it has its advantages for those who can afford to do so; and to an egotistical race like the British, it must prove of special service. Nothing expands a mind, capable of expansion, more than travelling. It erases the asperities of bigotry and self-conceit more effectually than anything else.

in the accounts of the various ancient authors on the subject. His age has been variously stated to have been 85, 90, 104, and 109 years. We are here, however, more immediately concerned with what he did for medicine, and we find that he accomplished more both for medicine and surgery than any or all of those who had preceded him, and indeed few of those who have come after him have been able to come even within sight of him as an original and able thinker and benefactor of the profession.

He freed medicine to a great extent of most of the gross ignorance and superstition by which it was encompassed, and set a glorious example of indomitable energy and diligence, high morality, and philosophical research. With such high qualifications, it need not be wondered that he soon raised the fame of the Medical School of Cos to a pitch far above its rivals.

Dr Pitcairn, in his "Solutio Problematis de Inventoribus," sufficiently indicates that Hippocrates' notions of the circulation of the blood must have been rather obscure, and his acquaintance with anatomy must have been equally limited, consisting mainly of a combination of ignorant guessing and error.

The most marked features, however, in the medical career of this truly illustrious man was his great powers of observation, and his faithful delineation of diseases. In fact, so accurate were the pictures which he drew of diseases, that many of his descriptions hold good up to the present day, which has caused him to be styled, and not without reason, "the Father of the Study of Clinical Medicine."[1] The foundation of his practice was rational experience, not a blind or misguided empiricism. This is well exemplified in the best, and perhaps the greatest, of his aphorisms "ἡ πειρα οφειλερὴ η κρισις χαλεπή," "experimentum periculosum, judicium difficile." He divided the causes of diseases into two classes, the first consisting of the influence of seasons, climate, water, situation; and the second of personal causes, such as food and exercise. The conformation of the body and disposition of the mind he attributed to the effects of climate, and in this way accounted

[1] The late Dr Warburton Begbie, in an able and lucid address delivered before the British Medical Association in August 1875 on "the Ancient and Modern Practice of Medicine," lavished the highest encomiums upon the powers of observation of Hippocrates, contrasting his description of the case of Philiscus with a similar case reported by the late Dr Laycock in the "Dublin Medical Journal," 1873.

for the difference between the hardy Greek and the effeminate Asiatic.[1]

The four fluids of the body, viz.: the blood, phlegm, yellow bile, and black bile, he regarded as the primary seats of disease, and that health was the result of the due combination (or crasis) of these, and disease the consequence of a disturbance of this "crasis." "When a disease was progressing favourably these humours underwent certain changes (or coction), which was the sign of returning health and preparing the way for the expulsion of morbid matter, or crisis, and these crises having a tendency to occur at definite periods," were termed critical days.[2] Fevers came, according to him, to a crisis on the same days as to number on which men usually recover or die, and it was on noticing the tendency of diseases either to recovery or to a fatal termination on certain days,

[1] The author is rather inclined to agree with the "Father of Medicine" here. That climate has produced a wonderful influence upon man need not be doubted. At any rate, both intellectual and physical superiority appear to have become more developed in temperate climates than in any other.

[2] The reader need scarcely here be reminded that the critical days of the Burmese medical writers already given differ but little from those of Hippocrates, a very significant fact, tending to show that similar ideas originate in the minds of the great and the small.

also the occurrence of evacuations or of crises in their course, that led him to study the whole subject of prognostics.

Though his principal study of medicine was in connection with philosophy as a science, and the treatment of internal diseases, the largeness of his intellect enabled him also to devote some attention to surgery, and a very formidable surgeon he was. His maxim was that "when medicine failed, recourse should be had to the knife, and when the knife was unsuccessful, to fire." From this we may conclude that both the knife and fire were in pretty frequent requisition. All the ancients, from the time of Prometheus downwards, appear to have had a predilection in favour of the actual cautery.

Hippocrates used it in various ways. Sometimes he applied red hot irons to the part; at other times he raised a conflagration on the spot by a piece of wood dipped in boiling oil, or by burning flax on the part somewhat after the manner of a modern moxa. He also made use of tents and issues when seeking the effects of a gentler counter irritant. Moreover, he appears to have performed capital operations with considerable success and skill, except lithotomy, which

was confined to the hands of a few who made it a special duty.

Notwithstanding all this he must have been a rough medical giant, and a terrible counsellor in surgical cases. Though he was extremely cautious in the treatment of internal diseases, this good quality was more than counterbalanced by his boldness and apparent recklessness. He reduced dislocations and set fractures "clumsily and cruelly," and used the trepan in depression and other accidents of the cranium, as well as in headaches, and some affections to which such treatment was altogether unjustifiable!

In empyema and hydrothorax, after diagnosing the presence of fluid in the cavity of the chest *by percussion and auscultation*, he did not hesitate to make an incision between the ribs, letting off part of the fluid, and then plugging the wound with a tent, which was removed once a day until all the fluid was evacuated.

He seems to have been familiar with the symptoms of tetanus and spontaneous gangrene, for he observes that in minute wounds of tendinous parts, such as fingers and toes, fatal convulsions frequently followed, and that black spots on the feet often terminated in incurable mortification. Strange to say

that his means of detecting fluid in the cavity of the chest were exactly those which are used at the present day, and which had almost lain dormant for upwards of two thousand years and more, until permanently established by Laennec about the year 1819.[1]

Another remarkable feature in his treatment of internal diseases coinciding with modern opinion was his advocacy of eschars on the back and chest in cases of pulmonary consumption. In the case of large calculi firmly lodged in the kidney he advocated a free incision to be made, shrewdly remarking that otherwise no hope of cure need be entertained as an excuse for his temerity.

He wrote with great elegance and fluency, which made a considerable impression upon his contemporaries, who wished and tried to reward him during his lifetime. "The inhabitants of Argos voted him a statue of gold. He was more than once crowned by the Athenians, and, though a stranger, was initiated into the most sacred mysteries of their religion, the highest distinction which they could confer. After his death, universal and almost divine honours were paid to his

[1] His "Traité de l'Auscultation Mediaté" was published in that year for the first time.

memory. Temples were erected to him, and his altars covered with offerings."

According to Dr Greenhill, in his article upon Hippocrates in Smith's "Dictionary of Greek and Roman Biography," the works of Hippocrates are stated to be upwards of sixty in number, and he divides the collection into eight classes. But since it has puzzled the various writers who have treated of the history of medicine to separate the genuine from the spurious, it will suffice here to mention class 1, which are known to have been written by Hippocrates himself. They comprise, giving the Latin instead of the Greek titles: "Prognostica;" "Aphorismi;" "De morbis popularibus;" "De ratione victus in morbis acutis;" "De aëre aquis et Locis;" and "De capitis vulneribus."

The best English translation of his genuine works was published in 1849, in 2 vols., by the late Dr Adams for the Sydenham Society.[1]

Few of the disciples of Hippocrates attained to any eminence.[2] His kinsman Ctesias,

[1] Hippocrates was moreover the first to divide the alimentary canal into jejunum and cæcum, to attribute to muscles the peculiar endowment of contractility, to demonstrate nerves, and to name the aorta and ventricles of the heart.

[2] Herodicus, a contemporary of Hippocrates, was the first who instituted gymnastic exercise in the cure and treatment of disease. In the time of the Asclepiades horse exercise

405 B.C., is said to have acquired considerable fame, for when he was taken prisoner by Artaxerxes Mnemon, in a battle fought between him and his brother Cyrus, he succeeded in curing his captor of a severe wound, by which he gained both his confidence and esteem.

About 430 B.C. *Diocles Carystus*, inventor of the bellulon for extracting darts.

The most distinguished of the immediate descendants of Hippocrates was *Diocles Carystus*, who devoted a large share of his attention to the study of anatomy, devised a peculiar method of bandaging wounds of the head, and invented the instrument called the bellulon for extracting darts.

He was not, however, successful as a physician. He attributed general fever to the effects of wounds, abscesses, and inflammations in internal parts, from watching the effects of these lesions upon the external surface of the body. He followed the practice of his profession, like Hippocrates, "not for lucre or vain glory, but from real love of the medical art and a pure spirit of humanity."

429–370 B.C. *Plato*, a distinguished philosopher, and originator of the philosophy of idealism.

Plato flourished about the same period, was much in vogue, but readily gave way to the manly exercise of gymnastics, which savoured neither of effeminacy or luxury, two things which were heartily despised in this age of moral and intellectual improvement.

having been born at Athens in the year 429 B.C., and was in his zenith about 370 B.C., his birth having occurred shortly after the commencement of the Peloponnesian war, and the same year in which Pericles died. Though connected with medicine he was more famous for his philosophy than for what he did for physic. Like most of the ancient philosophers he travelled a great deal, which may be accounted for by the political troubles which existed in his own country.

He made no less than three visits to Sicily during the time of the elder and younger Dionysius, as well as to Italy, having been intimately connected with Archytas and the Pythagorean philosophers, for Aristotle remarks that he borrowed from Heracleites as well as from Pythagorus, and "put a stamp of freshness and originality on all that he borrowed."

The chief characteristic of the Platonic philosophy was *idealism*, as opposed to *realism*, *materialism*, or *sensationalism* in their general acceptation, essentially a poetical and artistic philosophy, for, according to him, poetry, painting, and music grow out of *idealism*, or "those lofty inborn conceptions by which genius is distinguished from talent."

He strongly deprecated the teaching of

philosophy for fees, which pretty clearly shows that he must have been a man of independent means,[1] as well as by the fact that he never held any public offices for the sake of gain.[2]

384–322 B.C. *Aristotle*, the greatest philosopher of his time, and said to be the first who gave the aorta its name, and to demonstrate that all blood-vessels centre in the heart.

Though, strictly speaking, not belonging to the medical profession, yet on account of his intimate acquaintance with anatomy, *Aristotle* may be mentioned as perhaps the most distinguished philosopher who has appeared in the history of the human race. Born about 384 B.C., at the Grecian colonial town of Stageira, on the west side of the Strymonic Gulf (now the Gulf of Contessa, in Turkey in Europe), he belonged to a family in which the practice of physic was hereditary. His father, Nicomanchus, was the friend and physician of Amyntas II., king of Macedonia, father of Philip, and grandfather of Alexander the Great.

Having lost his parents at an early age, Aristotle was reared under the care of Proxenus, a citizen of Atarneus, in Asia Minor, who was then settled at Stageira. So far as we

1 "Without a solid independence no man can be happy or *even* honest."—Janius. Perhaps one of the truest sayings ever uttered.

2 The best account of the Platonic philosophy in the English language is to be found in Archer Butler's "History of Greek Philosophy," Vol. II.

are concerned with him it appears that, notwithstanding his zeal for the study of philosophy, he devoted a considerable share of his attention to the study and dissection of animals, and was acquainted with all the facts known to his predecessors.

He soon, however, abandoned the study of anatomy and took to the cultivation of general knowledge, in which he acquired the greatest possible distinction. He is said to have been the first to give the aorta its name, though this discovery has also been attributed to Hippocrates, and to have demonstrated that all blood-vessels centre in the heart.

His philosophy differed from that of Plato in the fundamental doctrine of the theory of idealism ; nevertheless he often talked of that gifted philosopher in terms of admiration and affection. His writings embraced the whole area of the knowledge of his time, many of which are lost. Among those extant are his works on astronomy, mechanics, physics, and the thirteen books called metaphysics. His theory of the rotation of the sphere, and the impossibility of a vacuum, caused greater confusion than anything else in explanation of the phenomena of nature. His organon or logic, and a considerable portion of his writings, relate to the human mind and body.

He also wrote on rhetoric and poetics, and an elaborate treatise on ethics; but perhaps some of his best efforts have been expended upon politics. Notwithstanding all his philosophy, however, he was unable to explain the cause of the dew, which, in those enlightened days, appears to be so very simple.

370 B.C. *Praxagoras*, the first to distinguish between the arteries and veins, and to have observed the pulse as an index of the state of the system.

The last of the Asclepiades who attained to any great distinction was *Praxagoras*, of Cos. As a surgeon he was equally bold, if not more rash than Hippocrates, for he practised excision of portions of the soft palate in bad cases of cynanche, and made free incisions into the bowels to relieve obstruction when milder measures failed; and demonstrated the difference between the arteries and veins so far as could be in his time ascertained; and drew attention to the pulse as an index of the general state of the system.

About 300 B.C. *Ptolemy Soter*. Prejudice against dissection first overcome in his time.

On the dismemberment of the great empire of Macedonia after the death of Alexander the Great, learning found a favourite nidus at Alexandria[1] under the protection of *Ptolemy Soter*, about 300 B.C.; and it was here that the popular prejudice against examining dead bodies was first overcome;

[1] The Alexandrian school was founded about 320 B.C.—"Encyclopædia Britannica," Art. Med.

one of the greatest triumphs achieved in any age as far as regards the healing art, for, without a knowledge of anatomy, there could be no advance made either in medicine or surgery. A knowledge of anatomy is as essential to the advancement of medicine as mathematics are to the science of astronomy. Without them the one could be nothing more than a system of quackery, and the other a science based upon wholesale guessing.

The first who had opportunities of dissecting the human body were *Herophilus* and *Erasistratus*, two of the greatest ornaments of the Egyptian School of Medicine, who not only corrected many errors, but made numerous discoveries in anatomy through having the bodies of criminals handed over to them for dissection, and it is alleged of them that their enthusiasm in this inquiry led then to "open the bodies of living criminals for the furtherance of their physiological views."

285 B.C. *Herophilus*, a famous physician and anatomist of the Alexandrian school, who first described the Torcular Herophili, the Calamus Scriptorius, and the Duodenum.

Herophilus, perhaps the most distinguished of the two, was born at Chalcedon, in Bithynia, and flourished in the fourth and third centuries before the Christian era. He settled at Alexandria, and distinguished himself by his devotion to the study of anatomy. The names which he gave to

several parts of the body are still in use, and probably will continue so. It was he who gave the name "Torcular Herophili" to the confluence of the venous sinuses which are contained in the several folds of the dura-mater where they converge to a common point corresponding with the internal occipital protuberance. He also named the Calamus Scriptorius and the Duodenum.

He placed the seat of the soul, however, in the ventricles of the brain, and there is sufficient evidence to show that he confused the tendons and ligaments with the nerves; nevertheless he acquired a wide reputation as being one of the most distinguished of ancient surgeons, both on account of his brilliant cures and anatomical knowledge.[1]

About 260 B.C. *Erasistratus*, one of the boldest and most reckless surgeons of ancient times.

Erasistratus, a contemporary, also of the Egyptian Medicine School, was no less famous, though characterised by a peculiar boldness and recklessness, both in the use and invention of the most formidable instruments. In cancer and tumours of the liver he did not hesitate to make free incisions

[1] The few fragments of his writings which have been collected were published in a dissertation entitled "De Herophili celeberrimi medici vita, scriptis, atque in medicina meritis."—Gott., 1840.

Herophilus is also said to have first traced the nerves to their termination in the spinal cord.

down to the parts affected, and to apply remedies direct to that organ. He was even more reckless in his treatment of diseases of the spleen, holding that it was of little use in the animal economy. In retention of urine he used a particular kind of catheter, which long bore his name. Having resided for some time at the Court of Selencus Nicator, king of Syria, he acquired a great reputation for having discovered and cured the disease of the king's eldest son, who was pining away for love of the beautiful Stratonice whom his father in his old age had married. His principal fame rests upon his devotion to the study of anatomy, which he zealously undertook on settling at Alexandria, and for which subject he relinquished practice altogether.

He believed the heart was the origin of the veins and arteries; and had it not been for his conviction that the arteries contained air instead of blood during life, there can be little doubt but that he would have anticipated Harvey in his discovery of the circulation of the blood.[1] That both he and

[1] The tricuspid valve of the heart was first described by him. He also was the first to detect the lacteal vessels in a goat, and described the use of the trachea for conveying air to the lungs. He also introduced chicory into practice as a remedy in hepatic affections.

Herophilus were independent thinkers, notwithstanding the influence of the Hippocratic school, may be gathered from the following passage from the first book of Celsus. After describing the fame of Hippocrates, he goes on to say: "Post quem dicœles carystus deinde Praxagoras et Crysippus, tum Herophilis, et Erasistratus, sic artem hunc exercuerunt, ut etiam in diversae curandi vias processerint," thus showing that they were not blind followers of their predecessors. He founded a school of medicine, wrote several works on anatomy, practical medicine, and pharmacy; but of his writings only fragments have been preserved. The date of his death is not known, only that he died in Asia Minor.

Among the immediate followers of Herophilus and Erasistratus may be mentioned *Xenophon, of Cos,* a physician who attained considerable renown, and seems to have been the first to arrest hæmorrhage from a limb by encircling it tightly with a ligature.

About 250 B.C. *Xenophon, of Cos,* the first who arrested hæmorrhage by applying a ligature round a limb.

A pupil of Herophilus named *Mantius* wrote a work on surgical dressings, which did not add to the simplicity of his subject; and another named *Andreas, of Carystus,* wrote on the union of fractured bones, and invented several cumbersome instruments for

About 250 B.C. *Andreas, of Carystus,* inventor of instruments for reducing dislocations.

the treatment of dislocations of the femur, which appears to have been characteristic of the disciples of the Alexandrian school.

Lithotomy was practised at this period, as well as in the time of Hippocrates, by a few individuals who made a special study of that subject, and it is said that one of them, *Ammonius*, invented an instrument by which he broke down stones in the bladder, clearly indicating that the idea of lithotrity did not originate with Civiale.[1]

About 250 B.C. *Ammonius*, inventor of an instrument for crushing stone in the bladder.

The greater portion of the writings of the Alexandrian school were lost in the great conflagration of the National Library in the time of Julius Cæsar, an incalculable loss, not only to the healing art, but to science in general. Shortly after this period Rome became the centre of intellectual advancement. "The arts and sciences followed the seat of empire, and once more flourished in the Roman capital, then one of the most enlightened cities in the world." Whether the Romans were hypercritical towards the medical profession, or inspired by a feeling of honesty and determination to expose all

[1] Serapion, who flourished about 235 B.C., was the head of the sect of empirical practitioners, to which also belonged Heraclides of Tarentum, one of the earliest cultivators of general pathology, practice of medicine, materia medica, pharmacy, and surgery.

quackery I cannot say, but certain it is that all classes of society maintained for some centuries an abhorrence of the practitioners of medicine and surgery, and trusted to spells and incantations for cures. This is rather a bad sign of the state of medicine at the time, and though we do not know the actual causes which brought about such a deplorable state of society, yet we may reasonably infer that there must have been a good deal of rascality on both sides. *Cato the censor* acted as physician to his own family, and "gravely wrote down the words of incantation for curing dislocation or fracture," and public edicts were issued "discouraging all countenance to the professed exercise of physic, and recommending faith in traditionery prescriptions and religious rites." It is not to be wondered at that in such rude times the popular cry against medicine should have proved fatal to the practice of it, and such we find to have been actually the case. For nearly the first six hundred years of its existence, Rome was without a practitioner of medicine, but, fortunately for humanity, this was not destined to continue, though the ultimate establishment of the healing art was not effected without a struggle.

After this long period of suspension the practice of medicine, or rather surgery, at Rome again made its appearance under the guidance of *Archagathus*, a Greek, from the Alexandrian school, who flourished at Rome during the consulates of Lucius Aemilius and Marcus Livius. His practice was chiefly confined to surgery, in which branch he attained considerable success,[1] but the ancient prejudice once more rose up against him. His fondness for the knife and cautery induced an enraged populace to rebel against him, compelled him to relinquish practice, changed his title of "healer of wounds" to that of "executioner," and banished him from the Roman capital.

219 B.C. *Archagathus*, banished from the Roman capital on account of his partiality for the knife and actual cautery.

After this another lull occurred,[2] until *Asclepiades* came upon the scene. This

96 B.C. *Asclepiades*, the first who recommended minute punctures of the abdominal parietes in ascites, and attempted the operation of laryngotomy, inventor of the shower bath.

[1] According to Pliny, the success which Archagathus attained in Rome must have been considerable, for when in his zenith the freedom of the city was conferred upon him by the Senate, who also purchased for him a shop and surgery in the Ælian Causeway.

[2] "About 150 B.C. a sect arose under the denomination of Essenes, or, as the Greeks called them, therapeutes, who studied the virtues of natural substances as curative or poisonous agents," from whom it is probable our modern word therapeutics is derived. Themison, of Laodicea, a pupil of Asclepiades, dissented from the theories of the Dogmatists and Empirics, and established another sect, who called themselves Methodici. The Dogmatists exercised the faculty of reason, whereas the Empirics trusted entirely to experience.

famous Greek physician, a native of Prusa, in Bithynia, was born about 96 B.C., and flourished during the early part of Cicero's life. After having wandered about a good deal between Alexandria, Parium on the Propontis, and Athens, he finally settled at Rome, where he acquired a considerable reputation. His insinuating manners and shrewd common sense greatly enhanced his popularity, while his sagacity dictated to him that to avoid becoming unpopular, it would be as well to eschew the risk of undertaking serious surgical operations, and, like many other medical philosophers, took more to the sister art of medicine, or the treatment of internal diseases. It must not be inferred from this that he was an ignorant surgeon; on the contrary, he seems to have had considerable aptitude for that branch. He practised paracentesis by minute punctures of the abdominal parietes in ascites, used local and general blood-letting as well as scarification of the fauces in quinsey, and even attempted laryngotomy. Through a mixture of quackery and good luck in treating internal diseases he managed to overcome the popular prejudice of the Romans against the doctors,[1] and paved the way for future

[1] His having been the inventor of the "Balneum Pensile,"

practitioners. "He was the contemporary of Cæsar, and the personal friend of Cicero." The latter, indeed, seems to have formed a high opinion of his medical capacity, for he remarks that "nothing brings men nearer to the gods than by giving health to their fellow creatures."

Of the immediate followers of Asclepiades, *Cassius*, or *Iatro-Sophista* as he was termed, was the most famous. As an anatomist and surgeon he was by no means despicable, for he left several works upon these subjects to perpetuate his name; and his powers of observation must have been equally acute, for he was the first to point out that injuries of one side of the head producing paralysis on the other was owing to decussation of the nervous fibres.

About 44 B.C. *Cassius*, the first who pointed out that injuries of the head producing paralysis on the opposite side of the body was owing to decussation of the nervous fibres.

Rome was signally deficient in medical heroes prior to the age of *Aulus Cornelius Celsus*, who probably flourished in the reign of Augustus. Having been "the contemporary of Horace, Virgil, and Ovid, he was likened to Hippocrates for the quantity of his sound practical information, and to Cicero for the eloquence of his style. He lived in the reigns of Tiberius, Caligula, Claudius, and Nero, in the beginning of the first cen-

About 40 B.C. *Celsus*, the first who recommended ligatures for the arrest of arterial hæmorrhage, and to describe the operation of depression for cataract, besides numerous other improvements in operative surgery, and the greatest of the Roman medical writers.

or shower bath, probably led to his acceptance by the Romans.

tury of Christianity, upwards of a hundred and fifty years before Galen.[1]

Besides his celebrated work "De Medica re," he wrote on rhetoric, history, philosophy, the art of war, and agriculture. He was called the Roman Hippocrates, because he introduced the Hippocratic system of medicine among the Romans. His medical works, divided into eight books, are both interesting and valuable, especially those parts relating to surgery, owing to his complete descriptions of the opinions and observations of the Alexandrian School of Medicine. Though it is not known whether he practised medicine or not, "his surgical operations and remarks impress us with a high idea of his ingenuity and judgment." "His mode of performing lithotomy (on the gripe) has been in recent times warmly defended by Heister, especially as applicable to children. He describes the operation for cataract by depression, and the method of performing an artificial pupil. The whole of his account of injuries

[1] A life of Celsus by the learned Dane, Joannes Rhodius, and subjoined to a second edition of his work, entitled "De Acia Dissertatio, ad Cornelii Celsi mentum, qua simul universa fibulæ ratio explicatur." Hafniæ, 1672, 4to. Refer also to "Jo. Babtistæ Morgagni in Aur. Corn. Celsum et Q. Ser. Samonicum Epistolæ in quibus de utriusque Auctoris variis Editionibus, Libris quoque manuscriptis et commentatoribus disseritur." Hague-Com., 1724, 4to.

of the head is admirable, and evinces wonderful tact and discrimination. His rules for distinguishing fracture, and for the application of the trepan, have been highly eulogised; nor is what he says about contrecoups less accurate. He is the first who has remarked that there may be rupture of a vessel within the cranium without fracture or depression, and he is also the first who recommended the application of ligatures to a wounded artery, with a view to arresting its hæmorrhage, after pressure has failed."

His descriptions and improvements of amputations in general are highly laudable, considering the age in which he lived. His remarks on the treatment of fractures and dislocations, carbuncles, hernia, hare-lip, etc., are eminently practical, and his treatment for some of these diseases did not differ much from that of the present day. That this man was a truly great philosopher will readily be gleaned from the following passage relating to an error of diagnosis committed by Hippocrates, and which he was candid enough to place on record. "Little geniuses, conscious to themselves that they have nothing to spare, cannot bear the least diminution of their prerogative, nor suffer themselves to depart from any opinion which

they have embraced, how false and pernicious soever that opinion may be; while the man of real ability is always ready to make a frank acknowledgment of his errors, especially in a profession where it is of importance to posterity to read the truth."

50–86 A.D. *Aretæus*, the first who made use of blisters, remarkable for his accuracy of details as regards diagnosis, and signally free of professional bigotry or jealousy.

The next Roman physician of any note was *Aretæus*, who was born in Cappadocia, 50–80 A.D., and flourished in the last half of the first and beginning of the second century of our era, and practised in Rome, probably about the time of Domitian. By some he was considered to rank next to Hippocrates, but he did not always implicitly follow the precepts of that great master. He was the first to make use of blisters,[1] and applied cantharides for that purpose. He frequently counteracted the "natural actions of the system" by administering purgatives and narcotics, and was much in favour of venesection. He was remarkable for a total absence of professional bigotry by not adhering to any set of opinions or principles.

In the accuracy of his details as regards the diagnosis and treatment of diseases he has been considered one of the ablest of the ancient physicians.

"His great work, written in singularly

[1] Also pointed out the glandular structure of the kidneys.

elegant and concise Ionic Greek, is divided into two parts." The first four books are devoted to the symptoms and causes of acute and chronic diseases; and the second four books to the treatment.[1] His conception that the untoward symptoms which sometimes followed bronchotomy was owing to the operation, brought that operation into disuse. His knowledge of anatomy must have been limited, for in his day dissection was prohibited by the severest penalties, nevertheless, he considered a knowledge of anatomy as being indispensible to both medical and surgical science. Among other things, he was the first who made use of leeches in the treatment of disease.

96-117 A.D. *Rufus, of Ephesus*, a zealous anatomist and surgeon, who wrote a treatise on diseases of the kidneys and bladder, and ligatured the brachial artery for traumatic aneurism.

Immediately following, if not a contemporary of Aretæus, we find *Rufus*, the Ephesian, who lived in the time of the Emperor Trajan, 96–117 A.D. This zealous anatomist wrote a treatise on diseases of the kidneys and bladder, and tied an artery which had been wounded in venesection at the bend of the arm, an improvement upon the treatment of his predecessors, inasmuch

[1] Chambers's "Encyclopædia." The best edition of his works is the Oxford one of 1723, by J. Wigan. A German translation appeared at Vienna, 1790-1802, and an English one, by S. F. Reynolds, Lond., 1837.

as that, previous to his time, aneurismal formations were invariably treated by incision and the application of the actual cautery.[1]

Heliodorus, a celebrated physician of Trajan, appears to have directed his attention principally to injuries of the head, on which subject he left some excellent observations, and *Antyllus*, by some supposed to have been a contemporary, by others not to have flourished till 340 A.D., was also a very zealous and successful surgeon, using the ligature as introduced by Rufus in the operation for aneurism, and boldly performing the operation of bronchotomy in threatened suffocation from diseases of the throat. He recommended arteriotomy in preference to venesection, pointing out that excessive loss of blood need not be feared, as it could always be arrested by dividing the artery right across. In aneurism his method was to tie the artery both above and below the tumour, excising the cyst and procuring its closure by granulation. He also mentions the operation for cataract by extraction, to

About 100 A.D. *Antyllus*, the resuscitator of the operation of bronchotomy, and a bold and successful surgeon, the first who recommended arteriotomy in preference to venesection, also made some valuable suggestions in the treatment of aneurism.

[1] He was also the first to suggest the existence of recurrent nerves as being subservient to the voice, and described the hyaloid membrane of the crystalline lens of the eye.—"Portal, Hist. de l'Anat. et de la Chirurg.," Vol. I. p. 74.

be performed cautiously, however, and only when the cataract is small. In obtaining the radical cure of hernia, he made free incisions into the parts affected.

"About the beginning of the second century, *Archigenes,*[1] *the Syrian,* settled in Rome, and distinguished himself both in medicine and surgery."[2] He appears, however, to have devoted his attention almost exclusively to surgical subjects, but, unfortunately, his writings have been lost sight of. Between the times of Celsus and Galen there were no great Roman writers on medical or surgical subjects. As the Romans did not encourage the liberal arts and sciences, and

About 100 A.D. *Archigenes,* a Syrian of considerable fame as a surgeon.

[1] A little anterior to this date Nero conferred the distinction of Archiater on his physician Andromachus in consequence of his having invented a celebrated compound called Theriaca, after which other physicians were styled Archiatri (Superpositus Medicorum), and exercised a superintendence over the profession generally.

Marinus, a famous anatomist, who described the structure of the glands, muscles, etc., and his disciple Quintus, lived about the same time; the latter, according to Plato, having been driven out of Rome because he killed all his patients ("Portal," Vol. I.). Quintus was not, however, responsible for his non-success, as the high mortality in Rome at the time was due to a pestilential fever which broke out immediately after the eruption of Vesuvius (79 A.D.), which buried Herculaneum under its ashes.—Meryon's "History of Medicine."

[2] Having described dysentery, and suggested opium as a remedy.

as the "grand patricians" declined to educate any members of their families, especially to the medical profession, Rome was at first supplied by medical practitioners "from Greece and Alexandria, and afterwards self-educated slaves and freedmen."

About 100 A.D. *Dioscorides*, the greatest ancient authority on botany and materia medica, and the first who published a work on materia medica.

Though it is not certain whether *Dioscorides* flourished in the first or second centuries of our era, yet, in consideration of his having for fifteen centuries maintained undisputed authority in botany and materia medica—an authority which he still holds among the Turks and Moors—I cannot do better than mention his name and works here as a fitting prelude to his more illustrious successors.

This famous Greek physician was a native of Anazarba, in Cilicia, and accompanied the Roman armies through many countries. His acute powers of observation led him, in these perigrinations, to collect an abundant store of information respecting plants, both as to their physical properties and their actions and uses.

His great work "De Materia Medica," treats of the properties, real or reputed, of all the medicinal substances known in his time, and described on the principal of the so called "humoral pathology." This cele-

brated treatise has been translated into the German, French, Italian, and Spanish languages, and there is also an Arabic translation in MSS. of the same in various libraries throughout Europe. Two other works have been ascribed to Dioscorides, but their authenticity is very questionable.[1]

The first great medical philosopher who comes upon the scene after the advent of Christianity is *Claudius Galenus* or *Galen*, a very celebrated physician, born at Pergamus, in Asia Minor, about 130 A.D. When only in his seventeeth year his father, Nicon, who had destined him to be a philosopher, "in consequence of a dream," chose for him the medical profession. His early education was conducted at Pergamus, afterwards at Smyrna, Corinth, and Alexandria. In his twenty-ninth year he returned to his native city, and was at once appointed physician to the school of gladiators.

130 A.D. *Galen*, the first great physician of the Christian era, and the greatest ancient authority on the pulse in the diagnosis and prognosis of diseases, also perhaps the most voluminous writer of any age, having written no less than eighty-three treatises admitted to be genuine, besides various commentaries, etc., divided the vertebral column into cervical, dorsal, and lumbar vertebrae, described the corpus callosum septum lucidum corpora quadrigemina, seven pairs of cerebral nerves, and the spinal nerves, etc.

"In his thirty-fourth year he went to Rome, where he stayed for about four years, and gained such a reputation that he was offered, but declined, the post of physician to the emperor." Returning to his native country in his thirty-eight year, he had

[1] The best editions of Dioscorides are by Saracenus (Frankf., 1589); and Sprengel (2 vols., Leipsic, 1829).

scarcely settled down when he received a summons from the Emperors M. Aurelius and L. Verus, on an expedition to the north-eastern frontier of Italy, whither they had gone to wage war against the northern tribes. On the breaking out of a pestilence in their camp the emperors returned to Rome, accompanied or followed by Galen, who obtained permission to be left at Rome, through alleging that it was the will of Æsculapius as revealed to him in a dream. It is uncertain how long he remained at Rome on this occasion; but from his writings it is clear that he attended M. Aurelius and his two sons, Commodus and Sextus; and was employed in compounding a celebrated medicine called Theriaca[1] for the Emperor Severus. The place and date of his death are unknown; but it is believed that he died in Sicily about the year 201 A.D.

This brilliant genius produced a great many works which created a powerful and lasting influence both upon science in general, and especially upon the medical profession. Before his time the profession was divided into several sects who were constantly at loggerheads with each other, as may readily

[1] Already mentioned as having been invented by Andromachus.

be imagined from their several designations, viz.: the *Dogmatici*,[1] *Empirici*, *Eclectici*, *Pneumatici*, and *Episynthetici*, etc.; and to him is due the credit of having rescued the profession from the chaos in which he found it. Indeed, his fame was so great as to prove detrimental to the profession, inasmuch as his opinions were accepted without modification by all the schools of the then civilised world for about 1300 years, thereby seriously retarding further advancement and research.

According to Choulant, in his "Handbuch der Bückerkunde fur die aeltere Medicin," the works still extant under the name of Galen number about eighty-three treatises admitted to be genuine, nineteen questionable, forty-five undoubtedly spurious, nineteen fragments, and fifteen commentaries on the works of Hippocrates, besides a great number of works whose titles only have been preserved. "Altogether, it is believed that the number of his distinct treatises cannot

[1] Soranus, of Ephesus, and Cœlius Aurelianus are supposed to have been contemporaries of Galen, the former having raised the sect of the Methodici "to its highest degree of reputation," and to have first described the Guinea worm (*Filaria Medinensis*); but to the latter is due the credit of having recorded a complete account of the system of the Methodici, and the best work of his day on the practice of medicine, "Cœlius Aurelianus," by T. Jansen ab Almeloween, Amsterdam, 1722 and 1755.

have been fewer than five hundred!"[1] His anatomical and physiological writings are the most important of his works. His pathology was purely speculative. In diagnosis and prognosis he laid great stress on the state of the pulse, on which subject he may be reckoned as the first and greatest authority, for all subsequent writers adopted his views without alteration.

In materia medica his authority was inferior to that of Dioscorides. He seems to have placed a greater faith in amulets than in medicine, and is supposed by Cullen to have been the author of the "anodyne necklace" which was so long famous in England.

So great was his fame that his writings throughout the whole civilised world were considered authoritative until within the last 300 years. A striking example of this is afforded by the fact, that in 1559 Dr Geynes "was cited before the London College of Physicians for impugning the infallibility of Galen; on his acknowledgment of his error and humble recantation, signed with his own hand, he was received into the College!"

As a surgeon and anatomist he appears also to have acquired great distinction,

[1] The author need scarcely observe that such an amount of work is hardly compatible with the life of a single man.

especially when practising at Pergamus, but in Rome he seems to have confined himself almost exclusively to medicine, probably on account of the dread of the Romans of the terrible operations of surgery. He was well acquainted with practical anatomy, but it is doubtful whether he had had many opportunities of dissecting the human subject, because he mentions, as being something very extraordinary, that the physicians who accompanied the Emperor M. Aurelius in his wars against the Germans, had sometimes opportunities of dissecting the bodies of the barbarians. His own experience was evidently confined to comparative anatomy, for he recommends the dissection of apes, bears, goats, etc. He mentions, however, that he had opportunities of "examining two skeletons preserved in Alexandria, and recommends all anxious to obtain a thorough knowledge of osteology to repair to that city."

In the capacity of a general practitioner, he himself mentions that he kept a drug shop in the Via Sacra, at Rome.

His skill in surgery appears to have been principally confined to the art of bandaging which he learned at the Alexandrian school, and the external use of fomentations, poul-

tices, plasters, and a complicated machinery for the reduction of dislocations and fractures. He recognised four cases of luxation of the femur backwards, a variety not mentioned by Hippocrates. He also treats of several species of hernia.[1]

Christianity and medicine, as well as all scientific knowledge, appear at this time, as indeed they do at the present day, strangely antagonistic to each other. The early Christians arrested progress "by attributing to martyrs and their relics the power of healing wounds and curing diseases," acknowledging only "the active interference of demons and blessed spirits in the affairs of men, and leaving true philosophy in total abandonment."

Whether as a result of Christianity or not cannot now be determined, but certain it is that shortly after the time of Galen, not only medicine, but also the arts and sciences lapsed into a state of ignorance and barbarism, leaving only a few names worthy of

[1] His works were originally written in Greek; some have been preserved only in Latin translations, and a few in Arabic. "The Greek text has been published four times. The first edition was the Aldine, printed in 1525, in five folio volumes; the latest and most accessible edition is that of C. G. Kühn, in twenty octavo volumes, the publication of which extended from 1821 to 1833."

notice, more from having preserved than advanced medicine. Among these were *Oribasius*, a pupil of Zeno, who lived in the time of the Emperor Julian, 350 A.D., and who became a celebrated physician, and private friend of that monarch. At the request of the emperor he compiled extracts from all the works left by the ancients "in methodical order, and divided them into seventy books, of which at the present day we possess only seventeen." Apart from these compilations, however, Oribasius published several works of his own of no great originality, though, in outline, judicious and useful. As a surgeon he was timid and cautious, discouraging operations except in extreme cases, confining his practice chiefly to the use of ointments and embrocations. Though he was in the habit of abstracting blood locally by making deep incisions and scarifications with the knife, he does not appear to have done much for the advance of surgery.

About 350 A.D. *Oribasius*, a celebrated physician of the time of the Emperor Julian, who compiled extracts from all the works left by the ancients. He was also the first to describe the membrana tympani and salivary glands.

About the same time lived *Nemesius*, first bishop of Emesa, in Syria, who wrote a work entitled "De Natura Humanâ," in which he sets forth a physiological problem to the effect that the semen is prepared in the brain, and descending afterwards by the

End of Fourth Century. *Nemesius*, first Bishop of Emesa, and author of an absurd physiological theory.

vessels which exist behind the ears, distributes itself over the whole body, and finally becomes deposited in the testicles. He also attributed the pulse to the contraction of the left ventricle of the heart.

550 A.D. *Aëtius*, a famous surgeon of the Alexandrian school, and the first who seems to have studied the nature and composition of urinary calculi, and to have mentioned the Dracunculus or Guinea worm, and a copious writer on a great variety of surgical subjects.

For upwards of two centuries between the time of Oribasius and that of *Aëtius*, of *Amida*, in Mesopotamia, who flourished about 550 A.D., no name of note appears, nor was any discovery made worthy of the name either in general science or in medicine. About this period the west was frequently invaded by the Huns, Goths, Alans, and Lombards, and science suffered in consequence. Though the Alexandrian school still continued the cultivation of medicine, little or no progress could be made. The Greeks, oppressed by the intolerant superstition of the Christians, gave up the study of medicine. The school of Athens once so famous, "was trodden under foot by the orthodoxy of the Christian emperors of the East; and, in place of encouraging, they persecuted the Pagan philosophers who taught medicine,[1] Justinian ordering them

[1] Procopius, the historian, if not actually a physician was at least learned in medicine, for besides naming many of his medical contemporaries he describes the plague of 543 A.D., which carried off 10,000 daily at Constantinople.

to be deprived of benefices which they had possessed for ages, and directing them to be bestowed on orthodox Christians only."

The Persian Empire was now the only place where medicine could be cultivated under the protection of the laws, and from this cradle the Nestorians, a sect of Christians, established a school of medicine at Edessa, in Mesopotamia, which soon became famous, and attracted pupils from all parts owing to the ability and excellence of its professors. A public hospital[1] was established at the same place, where, probably, the first lessons in clinical medicine were given. The most celebrated professor of this school was *Stephen, of Edessa.*

Aëtius was a pupil of the Alexandrian school, and pursued the same steps as Oribasius in collecting everything remarkable from the writings of the ancients. "His surgical writings are copious and valuable." He is one of the first to have mentioned the existence of the Dracunculus or Guinea

[1] Notwithstanding the superstition of the monks, and their contempt for learning in the fifth century, we owe to them the establishment of hospitals for the relief of human suffering, the first of which for the reception of the poor was built at Rome by Fabiola, a Roman lady and friend of St Jerome, about the same period.—Beckman's "History of Discoveries and Inventions, Art, Infirmaries, and Dispensaries."

Worm, and to have studied the nature and composition of urinary calculi. He also made a special study of diseases of the eye; suggested a variety of surgical queries respecting diseases which had escaped Celsus and Galen; and described several diseases which have been omitted by Paulus Ægineta. He cut out hæmorrhoidal tumours, operated for aneurism, described several varieties of hernia, inflammation of the intestines, eneysted tumours, diseases of the testicles, etc., indeed, on all branches of surgical knowledge, except dislocations and fractures, which seems strange, unless, as is alleged, "that in all likelihood quacks were at that time in complete possession of this branch of practice."

Some of his recommendations are pregnant with the grossest superstition and ignorance. In preparing a certain ointment "he required that there should be repeated in a loud voice, 'May the God of Abraham, the God of Isaac, and the God of Jacob deign to accord virtues to this medicine;'" and to crown all, he recommended coition for the cure of diarrhœa and relaxation of the bowels!

About 560 A.D. *Alexander, of Tralles*, a famous physician, who flourished in the time of Jus-

Alexander, of Tralles, so named from Tralles, a city of Lydia, and a famous physician of the time of Justinian, flourished

shortly after Aëtius, about the middle of the sixth century, considered to have been an author of more originality than either Oribasius or Aëtius; and with the exception of a few superstitious prejudices, perhaps the most original and best of the ancient physicians. He appears to have studied diseases minutely, and to have compared the observations and principles of his predecessors with his own, and to have formed an accurate and correct judgment on the different methods of treatment which he pursued. He seems to have been the first to mention the therapeutic use of rhubarb, and to have paid considerable attention to the specific and individual causes of diseases, laying particular stress upon the importance of studying the influence of age, strength, occupation, constitution, and mode of life, as well as the effects of seasons and atmospheric changes, inculcating the importance of observing the efforts of Nature in acute diseases. Of his surgical writings nothing is known further than that he wrote on diseases of the eye, and on fractures, but both have been lost.[1]

tinian, and the first to mention the therapeutic uses of rhubarb, and proposed colchicum as a remedy for gout.

About the beginning of the seventh

[1] He also recommended Hermodactylus (colchicum autumnale?) for the gout, and was one of the first who opened the external jugular vein in disease.

About 610 A.D. *Theophilus*, the first monk who wrote upon medical subjects, chiefly as a compiler.

century a celebrated monk named *Theophilus*, or *Philotheus*, or *Philaretus*, as he was called from his sanctity or talent, wrote some works upon medicine, consisting chiefly of compilations from Galen and Rufus, on the structure of the human body, in order to demonstrate the wisdom of God in the organisation of the human frame. He also published a work on the urine, and one on the pulse, both full of absurdities, and, together with Stephen, of Athens, one of his scholars, left commentaries on the aphorisms of Hipprocrates.

About 630 A.D. *Paulus Ægineta*, the first great obstetric physician and man midwife, originator of the operation of embryotomy and tracheotomy, also treated of fractures of the patella.

The celebrated *Paulus Ægineta*,[1] the last Greek medical author who deserves mention, was born in the Island of Ægina, and flourished during the conquests of the Caliph Omar about the middle of the seventh century. Little is known of his life further than that he prosecuted his medical studies first at Alexandria, and afterwards in Greece and other countries. Having been the first man midwife his forte lay in obstetrics and surgery, in the former of which he was eminently qualified to perform the operations which he describes. "His sixth book has been considered by many, and not without

[1] 660 A.D., Bilroth's "Surgery," Vol. II., Sydenham Society's Edition, 1878.

reason, as the best body of surgical knowledge previous to the revival of letters."

He recommended bleeding from the neighbourhood of parts affected with disease in preference to general blood-letting, and opened the temporal artery in cases of severe ophthalmia. He also performed venesection when necessary, opened internal abscesses by caustics, and defined the points at which paracentesis ought to be performed in the different varieties of ascites.

On ascertaining the situation of a calculus by rectal examination, he performed lithotomy, not by making an incision through the raphé of the perinæum, as recommended by Celsus, but by lateral incision, as practised at the present day. He also differed from Celsus inasmuch as that the latter (Celsus) limited the operation to patients between the ages of nine and fourteen, whereas he himself sanctioned its performance after the age of puberty, admitting that the chances of success increase with the youth of the patient. Having described several varieties of aneurism, he differentiates those cases suitable for operation from those which do not admit of surgical interference. All aneurisms, except aneurism by anastomasis, which he seems to have distinguished clearly

and accurately, he attributed to rupture of the coats of the artery, and did not hesitate to operate in cases which he considered suitable for operation.

In extirpation of the mamma, his mode of procedure was by crucial incision. He also practised laryngotomy and tracheotomy, committing the error of making a transverse instead of a longitudinal incision in the latter. By some he has been considered more of a compiler, like his predecessors Oribasius and Aëtius, than an original writer, sentiments in which the author does not concur.[1]

About 630 A.D. *Aaron Ahran*, the oldest medical author among the Arabs, and the first who described the small-pox.

Aaron Ahran, a contemporary of Paulus Ægineta, and a priest of Alexandria, published the oldest work in the possession of the Arabs. This work was entitled "Pandeets of Medicine," and consisted of thirty books, which were originally published in Greek, but were subsequently translated by a Jew of Bassora. Aaron was the first who drew particular attention to the small-pox, and gave a description of it, which, strange to say, was not noticed by his illustrious contemporary Paulus Ægineta.

[1] His principal works "De re Medica libri Septum," Lond., 1843, have passed through several editions.

The best English translation of his works has been rendered by the late Dr Francis Adams for the Sydenham Society.

Seventh Century. Monk Physicians.

After the sixth century the monks of the West practised the healing art as part of their divine calling by resorting to prayers, relics of martyrs, holy water, and other Romish ceremonials, and innumerable cures are said to have been accomplished by invoking the aid of saints, and other superstitious practices. In the seventh and eighth centuries the remains of the knowledge which had accumulated in the East appears to have been more or less preserved by the monks of the West.

The missionaries sent by Pope Gregory I. into England established schools in which medicine was taught, and some of our English ecclesiastics about the same time were distinguished for their acquirements and extensive attainments, especially Theodore, Archbishop of Canterbury (671 A.D.), Colomb, and Erigenes. Bede, according to his own account, gave practical instructions to those monks who practised medicine; and it is said that one of his precepts was to forbid bleeding during the first quarter of the moon. "The schools established by these ecclesiastics were much frequented by strangers, and thus the English, principally during the reign of Charlemagne, first lit the sparks of science in France and Germany."

Physicians first styled towards the end of the Eighth Century.

The schools established by order of Charlemagne were those of Lyons, Metz, Falda, Hirshau, Reichman, and Osnaburg. At first grammar, music, rhetoric, geometry, and astronomy only were taught in these seats of learning, but in the year 805 A.D. the emperor issued an ordinance for medicine to be added to the other branches taught, though he himself placed little confidence in physicians and their practices. Subsequent to this period medicine was taught in the schools of the cathedrals under the name of physic, and it appears that it was about the same time the title of physician was first applied to the savants of the healing art.

Little dignity, however, seems to have been attached to the title in those days, for a code of laws was promulgated by Theodoric, king of the Visigoths, which survived until the eleventh century in a great part of the West. Some of the edicts of this code were as follows:

"No physician shall bleed a noble woman or girl without a relative or domestic being present at the operation, and in case of contravention of this law, he shall pay a fine of fivepence," and when a physician is called upon to dress a wound he must "give surety, and agree upon the price to be paid upon his

cure, but he shall not demand anything should the patient die." "For the cure of a cataract he shall receive five sous." In the event of his wounding "a man of noble birth, he shall pay a fine of one hundred sous;" and further, if the man should die of his wounds, or from the effects of an operation, he "shall be delivered up to the relatives of the deceased, who may treat him as to them seemeth meet!" If, on the other hand, "it be a serf whom he has wounded or caused the death of, he shall be made to restore another to the lord." And when a physician takes a pupil, the latter shall pay him twelvepence for his apprenticeship.[1]

Owing to the contempt in which ecclesiastical opinions were held, various councils of the church in the twelfth and thirteenth centuries forbade the members of the superior clergy from practising medicine; and even the lower clergy, such as deans, sub-deans, and monks, were prohibited from performing surgical operations and using the actual cautery, etc.

"These injunctions were first issued by the Synod of Rheims, in 1131, and afterwards confirmed in the councils of Montpelier, in

[1] Lindenbrog. cod. Leg. Antig. Wisigoth in Sprengel Arzneigesch.

1162, of Tours, in 1163, of Paris, in 1212, and at Lateran, in 1139 and 1215, and were further renewed with greater vigour in the years 1220, 1247, and 1298."

About 763 A.D. *Caliph Mansur or Almanzor*, founder of the city of Bagdad, and a school of medicine, which afterwards became famous.

About the middle of the eighth century the *Caliph Almanzor*, the victorious, and a great patron of science, founded the city of Bagdad, where a college of medicine was established which became more famous than all the other schools of the Mohammedan states. Public hospitals and laboratories were founded which attracted students from all parts of the world, to the number it is said at one time of no fewer than six thousand, consisting chiefly of Christians banished on account of their religion.

Spain was about this time one of the most fortunate states ruled by the Mohammedans. From the eighth to the tenth centuries the three *Abdalrahmans* and *Alhakem* governed the countries subjected to the Caliphate of Cordova in such an enlightened manner, and with so much mildness, that science was both protected and fostered to a much greater extent than it could possibly have been under any Christian princes of these times.

End of Eighth Century. *Alhakem*, an enlightened ruler under the

At Cordova[1] *Alhakem* established an

[1] The following note with reference to the older Universities may be of some interest :

academy which for several centuries was the most famous in the world. In the tenth century it could boast of a library containing 224,000 vols. Schools were also established at Seville, Toledo, Saragossa, Murcia, and Coimbra, though none of them attained the reputation of Cordova. In the twelfth century there were seventy public libraries

Caliphate Cordova, protector of science, and founder of a famous academy.

With the exception of Cordova, which was established about A.D. 780, the University of Oxford[1] appears to be the oldest in Europe, having been founded in A.D. 872 by King Alfred the Great; Salerno prior to 1087; Bologna prior to 1158; and Paris about 1205.

The different Universities established in Europe previous to the Reformation, the year 1500, were: In Italy (omitting those already mentioned),—Vicenza A.D. 1204, Naples 1224, Padua 1228, Piacenza 1248, Arenza 1255, Perugia 1200, Macerata 1200, Rome 1303, Pisa 1308, Siena 1350, Pavia 1361, Ferrara 1391, Palermo 1394, Cremona 1413, Florence 1438, Catania 1445. In France,—Toulouse 1233, Montpelier 1180, Orleans before 1236, Lyons before 1200, Vienne uncertain, Perpignan 1340, Angers 1364, Aix 1400, Dôle 1426, Caen 1433, Bordeaux 1441, Valence 1452, Nantes 1463, Bourges 1464. Within the limits of the German Empire, which then extended over many provinces now incorporated into France, and over the Netherlands,—Prague 1348, Vienna 1365, Heidelberg 1387, Cologne 1388, Basle uncertain, Erfurt 1392, Leipzig 1409, Rostock 1419, Louvain 1426, Greifswalde 1456, Freiburg 1457, Trier 1472, Ingolstadt 1472, Tübingen 1477, Mayence 1477. In Great Britain,—Cambridge uncertain, St Andrews 1412, Glasgow 1454, Aberdeen 1494. In Spain and Portugal,—Salamanca 1240, Coimbra 1200, Valladolid 1346, Huesca 1354, Valenzia 1410, Siguenza 1471, Saragossa 1474, Avila 1482, Alcala

[1] "Medical Men and Manners of the Nineteenth Century."—Bailliere, Tindall, & Cox, 1877.

in that part of Spain subject to the Moors, "whilst Cordova produced 150 medical authors, Almenick 52, and Murcia 62."

As the study of anatomy was rigorously prohibited by the religious dogmas of the Mohammedans, the Arabian physicians were necessarily compelled to derive all their knowledge of this subject from the writings

1499; and in the Baltic States,—Upsala 1476, Copenhagen 1479.

After the time of the Reformation the following Universities were founded in Europe: In Italy,—Messina 1548, Fermo 1589, Mondovi 1600, Parma 1601, Cogliari 1606, Mantua 1625, Urbino 1671, Turin 1725, Camerino 1727, Sassari 1765, Milan 1766, Genoa 1783. In France,—Rheims 1558, Douay 1561, Besançon 1564, Pout-à-Mousson 1572, Strasbourg 1623, Corte (in Corsica) after 1700. In Germany,—Wittenberg 1502, Frankfort (on the Oder) 1506, Marburg 1527, Königsberg 1544, Dillingen 1549, Jena 1538, Helmstädt 1576, Altdorf 1578, Olmütz 1581, Würzburg 1582, Gratz 1586, Giessen 1607, Paderborn 1615, Rinteln 1621, Salzburg 1623, Osnabrück 1630, Münster 1631, Pesth 1635, Linz 1636, Bamberg 1648, Herborn 1654, Duisburg 1655, Innspruck 1672, Halle 1694, Breslan 1702, Gottingen 1734, Falda 1734, Erlangen 1743, Clausenberg 1775, Bonn 1778. In the United Provinces,—Leyden 1575, Franeker 1585, Harderwyck 1600, Groningen uncertain, Utrecht 1634. In Great Britain,—Edinburgh 1582, Aberdeen (Marischal College) 1593, Dublin 1591. In Spain and Portugal,—Seville 1504, Toledo 1518, Compostella 1532, Baeza 1533, Gandia 1549, Ossuna 1549, Almagro 1552, Orihuela 1552, Oviedo 1580, Ebora 1600, Onate 1600. In the Baltic States,—Kiel 1665, Lund 1668, Abo 1640, Dorpat 1632 (transformed to Pernau in 1699). In Poland,—Vilna 1597, Krakau 1632. In Russia,—Kiew in the seventeenth century, Moscow 1755.—From the "Penny Cyclopædia."

of the Greeks, and especially from the works of Galen. They must, however, have been quite alive to the importance of the study of osteology, for they took advantage of every opportunity of procuring human bones from the cemeteries, and it is asserted that *Abdullatif*, a celebrated Arabian physician of this period, on examining some bones obtained from a cemetery, observed that the lower jaw is composed of but one bone, and that the os sacrum is sometimes composed of several bones, though more frequently of one bone, to refute the assertion of Galen, who held that these bones were not single but composed of several pieces.

End of Eighth Century. *Abdullatif*, an Arabian authority in osteology and astrology.

The branches of medical science which are most indebted to the labours of the Arabs are chemistry and pharmacy. The modern names of alcohol, jalap, syrup, loach, naphtha, camphor, bezoar, and many others, have been derived from them.

The *Caliph Almamoun* surpassed all his predecessors in the services which he rendered to science. "Properly speaking, it was during his reign, about 812 A.D., that Greek literature was first introduced into the Arabian schools." As a noble example, this illustrious prince ordered new translations of the works within his reach, and purchased "far and wide the

812 A.D. *Caliph Almamoun*, renowned for the services which he rendered to science.

works of the ancients," and by supplications obtained many works on philosophy from the Grecian emperors, the study of which he encouraged by his own personal example.

The impetus thus given stimulated his successors to encourage the advancement of science, which flourished with great success in the different states under the dominion of the Arabs.

845 A.D. *Mesue*, a teacher of medicine.

Mesue, a successor of Aaron, and a pensioner at the Court of *Haron al Raschid*, taught medicine to the Arabs, of whose writings a few specimens have been preserved in the works of Rhazes. A disciple of his named *Hhonain* became more famous than his master through his translations of Greek works, and his history makes the first mention of academical degrees having been conferred by learned societies.

845 A.D. *Hhonain*, an able translator of Greek works, and the first to mention academic degrees being conferred by learned bodies.

Among his translations into Arabic may be mentioned the works of Hippocrates and Galen, Pliny, Alexander, of Aphradisea, Ptolemy, and Paulus Ægineta, as well as a translation of the work of Aristotle on plants, and withal a most philosophical physician for his age.

His sons were also well known translators. *Serapion*, the elder, who lived at the commencement of the ninth century, though

chiefly a compiler, first drew attention to a species of eruptive disease which he called echra, subsequently corrupted into essera, denoting a chronic form of nettle rash common among the Arabs.

Previous to this period, *Geber, of Mesopotamia,* had prepared corrosive sublimate, red precipitate, nitric acid, nitromuriatic acid, and lapis infernalis, most of which are still in use, and have had in their day as great a reputation as the most important ingredients which we now possess.

About 880 A.D. *Sabor Ebn Sahel,* the first who published a pharmacopœia of medical formulæ.

In the latter half of the ninth century *Sabor Ebn Sahel,* the director of the School of Oschoudisabour, prepared medicines according to certain formulæ under the sanction of Government, and bearing the title of *Krobadin,* which was the first compilation bearing the name of a dispensatory or pharmacopœia, and which was subsequently published under the direction of Government, who directed that the medicines should not be adulterated, nor sold at too high a figure, precautions which would be very acceptable at the present day under our Conservative Government!

About 882 A.D. *Rhazes,* one of the most illus-

The greatest medical hero of this period was *Rhazes,* who flourished about the end of the ninth and beginning of the tenth cen-

trious Arabian physicians, and one of the first who gave a clear description of the measles and small-pox, spina ventosa and spina bifida, etc.

turies. Having presided over an hospital at Bagdad, he had ample opportunities of studying both medicine and surgery. His principal works are the "Continent," and the ten books denominated "Almanzor," dedicated to Manzor, king of Corassini, though his reputation mainly rests upon his treatises on the small-pox and measles, two of the best works which we possess by the older writers on these diseases.

He was the first who gave a clear description of the measles, and added the following remedies to the list of therapeutic agents, viz.: orpiment, a sulphuret of arsenic, and the sulphates of copper and iron, borax, etc. As a surgeon, he was the first who described spina ventosa and spina bifida, though he does not appear to have had a very clear idea of the latter disease.

His knowledge of anatomy must of course have been of the most meagre description, as the study of anatomy was strictly forbidden by the Mohammedan religion, so that all his knowledge of that subject must have been derived from the writings of the Greeks. The religious prejudices of the Mohammedans was owing to their belief that "the soul did not instantly forsake the body, but lingered in some particular portion of it for some

time after apparent dissolution, so that the dismemberment of it might be a species of hideous martyrdom."

In cancer he advised that the knife should never be used except when the disease was limited, and that then the entire diseased structures should be removed, an observation which holds good to the present day. In the bites of rabid animals he practised cauterisation of the wounds, and subsequently emetics to expel the "black bile."

His remarks on hernia have been considered abler than anything to be met with in the writings of the Greeks on the same subject. Though an original thinker and investigator, it is admitted that in his surgical writings especially, he borrowed a great deal from the works of Hippocrates, Oribasius, Aetius, and Paulus Ægineta.

Besides the above, he is supposed to have contributed largely to chemical literature. His confidence in occulism does not appear to have been great, for when advanced in years he lost his sight through cataract, yet he would not submit to an operation because his surgeon could not tell him "in what manner the eye was covered by its membranes." In this he was probably not far wrong. He is supposed to have died about 923 A.D.

980 A.D. *Ali Abbas*, a celebrated Arabian physician, who made some valuable observations on dietetics, and published a great work, entitled "Almaleki; or, The Whole Book of Medicine."

Shortly after this period appeared *Ali Abbas* (or Hally Abbas, as he is styled by many), the magician, so named on account of the extent of his knowledge and acquirements. His principal work, entitled "Almaleki; or, the Whole Book of Medicine," was written about the year 980 A.D., and as a digest of the anatomical and phsiological knowledge of his time, was merely a transcript of the writings of the Greeks on these subjects.

The most important of his productions was his practical directions respecting diet, which appears to have possessed a considerable amount of intrinsic merit for the age in which he lived. His surgical writings are not remarkable for much originality. He recommended caustics for the cure of hydrocele "from the idea that they were efficacious when the redundancy of the humours flowed to a particular point," and in the treatment of ascites he punctured the linea alba a little below the umbilicus.

978–1036 A.D. *Avicenna*, the most illustrious of the Arabian physicians, having held despotic sway over medicine and general science for nearly 600 years, the inventor of the

Avicenna, who shares with Rhazes the honour of having first introduced chemistry in physic, flourished between 978–1036 A.D., and styled the prince of physicians, was born at Bokara, in Chorassan. His doctrines were almost implicitly followed for nearly six

hundred years, showing his despotic influence over the sciences to have equalled that of Aristotle or Galen, being without a rival either in medicine or general science. His great work, entitled the "Canon," though principally a compilation founded on the labours of his predecessors, formed the syllabus or foundation of the lectures in every university. In his day he was considered almost miraculous for the extent and variety of his knowledge, yet he had no claim to be considered a genius, though evidently a strong-minded man.

flexible catheter, and the instrument known as Hey's saw.

In surgery he distinguished between closure of the pupil and cataract, and recommended depression in operating for the latter. Extraction he considered a dangerous operation.

"It is probable that to him we owe the first use of the flexible catheter, as also of the instrument commonly known as Hey's saw."

Among the Greek physicians after the time of Paulus Ægineta, few men of any note made their appearance for a long period, consequently the state of medicine in Greece remained remarkably stationary, if it did not partake of a retrograde movement. *Nonus*, who lived towards the end of the tenth cen-

About 990 A.D. *Nonus*, the first who mentions

the distilled water of the rose as a therapeutic agent.

tury, compiled a work somewhat in Chinese fashion, consisting chiefly of the opinions of his predecessors, mixed up with a few observations of his own. In this compilation appears the first mention of the distilled water of the rose as a therapeutic agent, which Le Clere, Friend, and others attributed to Actuarius. Rose water as a perfume was first alluded to in a work describing "the ceremonies of the Emperor Constantine VII., where, at a feast given in 946 A.D., the priest speaks of the rose water as an agreeable scent."

About 990 A.D. *Simon Seth*, the first who treated of the medicinal properties of asparagus, camphor, and musk.

Another medical writer of the same period, and of no great reputation, was *Simon Seth*, keeper of the wardrobe in the palace of Antiochus, at Constantinople, who wrote a work entitled "Syntagma de Cibariorum Facultate," in which he copied the work of Psellus, a contemporary.

He is the first, however, who mentions the medicinal properties of asparagus, long known as an esculent vegetable. He also gives a description of camphor as the resin of an extremely large Indian tree, and likewise makes some observations upon the use of musk.

1004–1040 A.D. *Edward the Confessor*, the first

Edward the Confessor, through a mixture of astrology and theology with medicine,

imagined that he possessed the miraculous gift of curing diseases by the touch and uttering a few sacred words, hence the popular notion that the royal touch was efficacious in curing scrofula, which was in consequence designated the king's evil.

who imagined that he possessed the miraculous means of curing diseases by the simple touch.

After his example the kings of France became celebrated for their cures by the royal touch. Some have claimed this peculiar distinction for the "sovereigns of England and France, but history does not sanction this, for it appears to have been employed in Scandinavia, and to have been derived from the mystical practices of the Druids in curing disease."

The French kings in their manipulations made use of the words: Le Roi te touche, Dieu te guéresse.

The School of Salernum,[1] now Salerno, in Italy, in the eleventh and twelfth centuries became famous independent of the efforts of the ecclesiastics, though one of its most eminent practitioners was *Thieddeg* "an ecclesiastic of Prague, who had studied medicine at Corbey, and flourished in 1017."

1017 A.D. *Thieddeg*, an eminent medical ecclesiastic.

The nuns also studied and practised medicine as an act of charity, the most

[1] Probably founded in A.D. 802 by Charles the Great.—Bilroth.

1098–1180 A.D. *Hildegrade*, the celebrated Abbess of Rupertsberg, the first female physician of any note, and author of a system of materia medica.

learned of whom was *Hildegrade*[1] (A.D. 1098–1180), Abbess of the Convent of Rupertsberg, near Bingen, whose miracles caused her to be enumerated among the saints. Her correspondence, still in existence, shows that the higher clergy consulted her on all occasions. Her materia medica, which was certainly not borrowed from others, was both novel and original. She recommends "the common fern as a cure for witchcraft, the herring in the itch, the ashes of flies in all affections of the head, and the seed of the zedoary in salivation and pain of the head, and water mint in asthma."

In the time of the Crusades, Salerno, which was beautifully situated in an extremely healthy locality, was much frequented by

[1] Hildegrade was not the only lady physician who flourished in the middle ages. Sybil, the wife of Robert, Duke of Normandy, cured her husband on his return from the Holy Land of a poisoned fistulous wound of the arm by sucking it during his sleep, and she was not the only lady practitioner of Salerno. Professor Haeser, of Greifswalde, in his "Lehrbuch der Geschichte der Medicia," mentions the following authoresses as having distinguished themselves more or less in medicine: Abella, Mercuriadis, Rebecca, Trottu, and Constantia Colenda, the most famous of them all. None of them, however, are mentioned in the "Dissertatio Historico Critica de Feminis ex arte Medica Claris," by Polycarpus Fredrericus Schacker and Joannes Henricus Sehmidius. The Medical School of Salerno permitted females in those days to study medicine.

warriors from all parts on their way to and from Palestine, by whom the light of science was gradually spread over the whole of Europe. Though once so famous, the School of Salerno, with its university, did not long retain its high reputation, and is only known in modern times on account of its famous production of the "Regimen Sanitabis Salernitanum," of which more than one hundred and sixty editions have been published.[1]

About this period the Crusaders believed that the end of the world was at hand, and every phenomenon observed in the heavens by them created the greatest alarm. An eclipse of the sun caused such a panic among the followers of the Emperor Otho that the whole army dispersed, believing that "time was no more."

During the reign of the Emperor Frederick II. the School of Salernum reached its zenith of fame through the impetus which was given to learning by that highly accomplished monarch. He also established the Universities of Naples and Messina, and gave fixed

[1] A poem on the preservation of health, in rhyming Latin verse, addressed by the School of Salerno to Robert of Normandy, son of William the Conqueror, with an ancient translation by Sir Alexander Croke, D.C.L., etc., Oxford, 1830, 12mo, the composition of which is ascribed to John of Milan, 1100 A.D.

salaries to their professors. The monarchs of England, France, and the Popes followed suit by establishing learned institutions in their respective countries, and encouraged public teaching through the instrumentality of paid teachers.

Twelfth Century. The titles of bachelor, licentiate, and master first conferred by the Universities of Paris and Montpelier.

About the same period the schools of Paris and Montpelier obtained the title of universities, and first instituted the titles of bachelor, licentiate, and master, conferred upon physicians, the professors only being designated doctors, which title "soon acquired the same acceptation as master, and was ultimately substituted for it."

The Jews also practised medicine in the twelfth century, not only among their own people, but also among the Moors and Christians, who, from their superiority of skill and learning, became more famous than their Christian neighbours.

Twelfth Century. *Actuarius*, the first who recommended bleeding and purging in palpitation of the heart, and described the use of the milder purgatives, such as senna, manna, cassia, etc.

The next in chronological order comes the great Greek physician, John, son of Zachariah, surnamed *Actuarius*, a title corresponding to our modern "physician in ordinary," who practised with great distinction at Constantinople, probably about the beginning of the twelfth century.[1] Though his works are in a great measure compilations

[1] End of eleventh century according to Justus Wolfgang.

from the labours of his predecessors, he nevertheless made many original observations. Stephens considered one of his works as worthy of a place among the "Principes Artis Medicæ." In his observations on palpitation of the heart he recommended bleeding and purgation, and is the only Greek physician who treats of the milder purgatives, such as senna, manna, cassia, and myrobalans, which he borrowed from the Arabians, whom he designated as barbarians. His surgical treatises possess no great merit, having been merely compilations from previous authors. According to Justus Wolfgang he "wrote a work on therapeutics, in six books, for the use of an ambassador in the north.[1]

A famous contemporary of Actuarius was *Demetrius Pepagomenus*, who wrote a work on the gout, by order of the Emperor Michael VII., Palaelogus. This work has been highly esteemed, and considered in advance of most works of the same period. Following the precepts of Galen, his idea was that gout was a disease of the whole organism, produced by errors of diet and debility of the digestive organs, and recommended temperance, and a suitable regimen; though he admits that

Twelfth Century. *Demetrius*, one of the earliest authors on gout.

[1] "Biographie Universelle," Art. Actuarius.

patients are rarely met with who conform to such rules. Most physicians at the present day could endorse these judicious and sensible observations.

Another contemporary who attained the title of Actuarius was *Nicolas of Alexandria*, styled by himself Myrepsus, and perhaps one of the last Greek physicians who studied at Alexandria, and whose achievements consisted in having described all the medicinal appliances then known, with their respective uses. He also described plasters, ointments, cerates, and cataplasms, etc., many of which were borrowed from the Saracens; but, since he left no works worthy of note, he does not deserve further mention in this place.

Twelfth Century. *Nicolas Myrepsus*, a contemporary of Actuarius, and one of the last Greek physicians who studied at Alexandria.

Though not strictly in chronological order, it may here be mentioned that science and medicine underwent a retrograde movement under the reign of the emperors of Constantinople, from the fact that these princes had so little confidence in their physicians during the fourteenth century, that, when Andronicus III. was effected with a tumour of the spleen, he sent for an Arabian physician from Persia to attend him.

During the time of Mohammed the prophet, there were several physicians at Mecca who had been educated in the Grecian schools,

and the famous *Kha-Reth-Ebn-Kal-Daht* of Takif (622 A.D.), a contemporary, practised at the same time in Persia with considerable distinction.

As science declined in the West, it rose and flourished in the East, Alexandria having been captured by the Saracens under Amrou in 640. Learning was gradually communicated to Arabia through the medium of translations from the Greek authors.[1] Though the rich library at Alexandria now no longer existed, many valuable manuscripts had been rescued from its savage destruction, and were translated into the Arabic and Syriac languages; the first Arabic translation of which was made about the year 683 A.D. by Maserjavaitrus, a native of Syria; but the most eminent in this line was Hhonain, a Christian, already mentioned, and styled the translator, who was born at Hira in 764 of our era.

Albucasis, a celebrated Spanish physician, or rather surgeon, who died in the year A.D. 1122, distinguished himself more than his predecessors, especially in the cause of

1122 A.D. *Albucasis*, the first great Spanish surgeon, inventor of a probang for the dislodgement of foreign bodies from the gullet, and the first who described the *modus operandi* of natural hemostatics, also a voluminous writer on a great variety of surgical subjects.

[1] "Le clere, Historie de la Medicine," Geneva, 1696, 8vo.; Amst., 1723, 4to. "Freind's History of Physic, from the time of Galen to the beginning of the sixteenth century." Also see "Bibliotheca Graeca of Fabricius."

surgery, which, according to his own account, he found in a most deplorable condition.

His celebrated work on surgical operations is the most valuable contribution to medical literature of his age. In this work he describes the operation for removing stone from the female bladder, an operation which was only performed by midwives, as men were not permitted to offend the modesty of the opposite sex. His method of performing lithotomy resembled that practised by Paulus Ægineta, and he is the only surgical writer of ancient times who describes the instruments used in particular operations. Cauterisation and caustics appear to have been his favourite remedies, indeed, his faith in these adjuncts to surgical treatment amounted almost to veneration. He speaks of the "divine and secret virtues of fire surgically employed," and describes more than fifty diseases in which he found it efficacious. He is minute in his description of its application, recommending its use only to those "acquainted with the anatomy of the frame, and the position of the nerves, tendons, veins, and arteries." He employed cauterisation in arterial hæmorrhage, but also used styptics, complete division of the vessel, and ligature. He is supposed to

have been the first to observe that it is "by the formation of a coagulum in the orifice of an artery that its calibre is closed and hæmorrhage arrested." He invented a probang for dislodging foreign bodies from the gullet, and describes a particular instrument of his own for the cure of fistula lachrymalis, as well as the needle used by the surgeons of Iruk for the cure of cataract. Among other subjects he drew attention to the fact that bronchocele is more common in women than men. He further mentions an operation for the relief of hydrocephalus, removing tumours by ligature, and touches upon amputation in gangrene of the extremities, treats of abscesses, excision of the tonsils, tracheotomy, and several other important surgical subjects.

1169 A.D. *Avenzoar*, a distinguished Spanish Arabian physician, who first described inflammation and abscess of the mediastinum, etc.

Perhaps one of the most original of the Arabian physicians was *Avenzoar*, a Spanish Arab,[1] who practised with great distinction about the year 1169 of the Christian era. He is the first who described inflammation and abscess of the mediastinum, from which it seems he himself suffered, as well as inflammation of the pericardium, and dropsy and empyema of the same. He records a case of abscess of the kidney from which

[1] And a native of Seville, in Andalusia.

fourteen pints of water were evacuated, and details various cases of "rupture, fracture of the hip-bone, wounds of the arteries and veins, tumours, and other varieties of surgical disease, which he appears to have understood well, and treated with discretion." He, moreover, mentions that lithotomy in those days was reckoned by the Arabians as "filthy and abominable, and unfit for any man of character to perform;" and held that "no religious man" should ever view the genitals! He recommended the injection of nutritious fluids by the rectum in cases of stricture of the gullet, and advised in the same disease the occasional passage of a tin or silver tube, and the use of a milk bath, in order that nutritious particles might be absorbed by the pores of the skin.

End of Twelfth Century. *Averrhoes*, one of the brightest luminaries among the Arabian philosophers.

Another bright ornament in the history of Arabian philosophy was *Averrhoes*, a pupil of Avenzoar, born at Cordova about the middle of the twelfth century, and flourished in the early part of the thirteenth century. Having cultivated medicine only as a branch of general philosophy, and having altogether neglected surgery, we have no more concern with him at present. He is supposed to have died about the year 1206 of our era.

End of Twelfth Century. *Ebn Beithas*, the last of the Arabian physicians, with whom the medical history of that nation terminates.

The last of the Arabian physicians deserving mention was *Ebn Beithas*, born at Malaga, a celebrated botanist, who published some works on materia medica and veterinary medicine, but beyond this he does not seem to have done anything remarkable except to have terminated the medical history of that nation.

And here we may take leave of the Arabians. In the East they lost their taste for science much sooner than in Spain and Morocco. The Turks in the eleventh century destroyed most of the caliphates in Asia, substituting their own despotic government instead. About this time the Saracens made some exertions for the advancement of medicine, principally in retaining the knowledge which had been transmitted to them through the Greeks. Anatomy remained stationary, and chemistry and materia medica were the only branches of medicine which made any advance among them. They divided physic, surgery, and pharmacy into three distinct professions; invented numerous complicated instruments, attaching too much importance to the mechanical part of their profession. In surgery, for instance, to arrest hæmorrhage from a wounded surface it was a not uncommon practice to dip the part into boiling

pitch! which was in those days considered one of the most efficacious of styptics.

"The last traces of their intellectual illumination appeared among the Spanish Moors in the thirteenth century, when the Christian arms having become more and more powerful, they were compelled to substitute the field for the study—the sword for the pen—and, before an overwhelming opposition, were at length driven from a region whose fields they had tilled, and whose olives they had gathered for a thousand years. With the decline of the Saracenic school, the daylight of science went down over the nations; and an intellectual darkness, which endured for three hundred years, enveloped the general face of society. All the fountains of science were dried up, and the world seemed retrograding into the unillumined chaos of ignorance."[1]

1271 A.D. *Jean Pitard*, the first famous French surgeon, and founder of the College of Surgeons of Paris.

The most remarkable advance in medical science about this era took place in France during the reign of Saint Louis. Through the influence of the famous *Jean Pitard*, the foundation of the College of Surgeons in Paris was laid in 1271. This illustrious surgeon and confidant of the king contri-

[1] Moir's "Outlines of the Ancient History of Medicine," Edin., 1831.

buted largely to elevating his profession from the humble state in which he found it. He taught surgery regularly, and though he was not remarkable for any brilliant discoveries, he certainly paved the way for those who succeeded him.[1]

His contemporary, *Gulielmus de Saliceto*,[2] a professor at Verona, is said to have been a "powerful man," both in medicine and surgery, inculcating the importance of observation in preference to studying books; he seems to have understood the proper basis upon which scientific medicine could alone be cultivated, and in which direction he himself set a good example.

Thirteenth Century. *Gulielmus de Saliceto*, a contemporary of Pitard's, and the first great Italian surgeon.

In our own country, the first name of any note in connection with surgery is that of *Gilbertus Anglicanus*, who appears to have been nothing more than a compiler from the

Thirteenth Century. *Gilbertus Anglicanus*, the first English surgeon of any note.

[1] *Roger Bacon*, a Franciscan monk, and one of the earliest English philosophers, after having studied at Oxford, graduated at Paris, 1240 A.D., and gave a slight impulse to medicine through his advocacy of the importance of a knowledge of the exact sciences, but his mind was so much imbued with astrological notions that both himself and his theories were soon shelved in obscurity. By some he has been considered the inventor of the microscope. His contemporary *Albertus Magnus*, a prelate in high esteem with the papacy, appears also to have had some knowledge of physic.

[2] Peter d'Albano, the Italian magician, lived about the same time.

writings of the Arabians, though he described lepra very accurately.

Thirteenth Century. *John, of Gaddesden*, author of the "Rosa Anglica."

Shortly after him appeared *John, of Gaddesden*, a most learned and ingenious, as well as a skillful practitioner, and author of the "Rosa Anglica," showing him to have been a man of no ordinary attainments.

Thirteenth Century. *Lisfranc, of Milan*, one of the earliest and most famous of the Italian surgeons.

About this period Italy appears to have made considerable progress in surgery. The celebrated *Lisfranc, of Milan*, "medicin chirurgique," or surgical physician[1] as he was called, having been compelled to leave his own country, commenced a course of surgery in Paris in 1295, where he acquired the greatest celebrity, and where he published his "grande Chirurgie," which served as a guide book until superseded by the labours of Guy de Chaulaic, towards the end of the fourteenth century.

Thirteenth Century. *Roger, of Parma*, Chancellor of the University of Montpelier.

Roger, of Parma, having established himself at Montpelier, afterwards became chancellor of that university, and first introduced into his own country a description of the operations of Albucasis and his pupil and successor.

Thirteenth Century. *Roland, of Parma*, an able investigator into surgical pathology.

Roland, of Parma, a professor at Bologna, practised with considerable distinction, and

[1] All lay physicians practising surgery at this period were so styled.

is said to have done a great deal for surgical pathology.

Early in the fourteenth century medical instruction and study underwent a great revolution through the instrumentality of the celebrated *Mondini de Luzzi*, professor of anatomy at Bologna,[1] who, in 1315, dissected the human subject for the first time in the presence of his pupils. Hitherto the prejudices of every religious sect prohibited the dissection of human bodies, so that from the time of Herophilus and Erasistratus, those who directed their attention to the study of anatomy were obliged to derive all their information from the dissection of animals, especially dogs and pigs, accepting the nomenclature of all parts of the body mentioned in the works of Galen. He afterwards wrote a treatise on anatomy, entitled "Anatome Omnium Humani Corporis Interiorum Membrorum," describing the different parts of the human body from Nature, which, it is said, was considered a classical production for more than two centuries.

1315 A.D. *Mondini de Luzzi*, the first who systematically dissected the human body, and whose treatise on anatomy was the recognised text-book of the medical schools until the middle of the Sixteenth Century.

The immediate successors of Mondini were *Nicolas Betrucci* and *Argelata*, both professors at Bologna, and *Henry de Hermondaville*, of Paris, besides others of more or

1320 A.D. *Nicolas Betrucci* and *Argelata*, celebrated anatomists of the Fourteenth Century.

[1] Founded prior to 1158 A.D.

less note, who distinguished themselves for their sedulous application to, and demonstrations of, anatomy.

The example set by Mondini was eagerly followed by others, and soon found advocates at the different seats of learning. The principal universities now recognised the importance of the practical study of anatomy, and several times a year gave demonstrations to their pupils upon the human body. So great was the influence of Mondini that the statutes of the University of Padua [1]—then, perhaps, the most famous in the world—prescribed that all its anatomical lecturers should adhere to the literal text of Mondini's great work on anatomy. He died about 1326, universally respected and lamented.[2]

The principal obstacles to advancement at this period were the universal belief in astrology and theosophy, which pervaded all the medical schools through the writings of the Arabians, and especially those of Averrhoes, whom Haller appropriately termed "Arabists," one of the most successful propagators of which was *Arnold, of Villa Novo*, pro-

1320 A.D. *Arnold de Villa Nova*, a strenuous advocate of the Arabian doctrine of medicine.

[1] Founded about 1128.

[2] Mundinus Sagt. John Adolphus in der von ihm besorgten Strassburger Ausgabe vom Jabre 1513, "Quem omnis studentium universitas colit ac Venerat ut deum." Haeser, Lehrbuck, der Grschichte der Medicin.

fessor at Barcelona, a man of considerable talent, more famous for his chemical than medical knowledge, and who received his astrological instruction from the celebrated Raymond Lully.

The most famous of the Arabists, however, was *Bernard de Gordon*, a professor at Montpellier early in the fourteenth century, who wrote a system of medicine entitled "Lilium Medicinæ," possessing considerable merit, and displaying no ordinary amount of erudition. By some he is said to have been born in Scotland, but I am not acquainted with any evidence at all likely to establish the pawning of this genius upon the "land o' cakes and barley scones," further than that the surname sounds familiar.

Fourteenth Century. *Bernard de Gordon*, a warm supporter of the Arabian school of astrology and theosophy, supposed to have been a Scotchman by birth.

About the same time a rather celebrated Portuguese, named *Valesco de Taranta*, practised at Montpellier with considerable success, and who seems to have done something towards advancing the art of surgery, having been the first who proposed to cure cancer by the local application of arsenic. He does not appear, however, to have acquired any great distinction, or to have made any discoveries beyond the simple fact above mentioned.

Fourteenth Century. *Valesco de Taranta*, the first who employed arsenic in the cure of cancer.

The most celebrated man of this age was

About 1350 A.D. *Guy de Chauliac*, a renowned surgeon of Avignon, and author of a great work on surgery, wherein is the first mention of the Cæsarean operation.

Guy de Chauliac, a Frenchman, of whom the French nation is still justly proud. After studying at Montpellier and Bologna, he practised as a general practitioner at Lyons, and subsequently at Avignon, where he officiated in the capacity of physician to three successive popes, and acquired the greatest possible renown as a reviver "of the languishing art" of surgery. In his great work on surgery entitled "Inventorium, sive collectorium partis Chirurgicalis Medicinae," which obtained as great a fame in France as that of Mondini in Italy, he gives an accurate account of the state of surgery in his day, and in the same work is to be found the first mention of the Cæsarean operation.

Surgeons were at this time divided into five sects, as follows: The first applied cataplasms indiscriminately to all kinds of injuries and diseases; the second in similar cases gave wine only; the third expended their skill in using emollient ointments and plasters; the fourth were principally military surgeons who made use of oils, wool, potions, and charms; and the fifth, consisting of "ignorant practitioners and silly old women, who had recourse upon all occasions to the saints, praised each other's writings perpetu-

ally, and followed each other in one undeviating track like cranes."

Fallopius gives him the credit of having been the first legislator in surgery as Hippocrates had been in medicine, and Haller generously observes that, "having read all works written up to his time on that important branch of medicine, he carefully exposed the divers opinions of authors, and duly appreciated each; so that his work may be regarded as an excellent historical sketch of surgery up to his time."

But what enhanced the reputation of Chauliac was that he "practised almost all the operations which he describes." "His theory of the cause of disease was the astral influence of the three great planets, Saturn, Jupiter, and Mars, entering into conjunction in the sign Aquarius, on the 24th March 1345."

A contemporary of this eminent surgeon was *John, of Arden*, an Englishman, who appears to have been a successful operator especially for fistula in ano, and is said to have written "with simplicity and honesty." His improvement of the trepan, by adding the central pin, in itself entitles him to an honourable position among those whose names are to be handed down to posterity.

1360 A.D. *John, of Arden*, an English surgeon, who attained a considerable reputation for his treatment of fistula in ano, etc.

He, moreover, recommends the operation of trephining to be limited to the severest forms of injury to the head.

In the beginning of the fifteenth century medicine made but little improvement owing to the universality of the false philosophy of the Arabians; and it was not until the time of the celebrated physician *Bartholomew Montagnana*, about 1460 A.D., a professor at Padua, that reason was brought to bear upon the superstitious practices and absurd notions upon scientific subjects which existed at that time. This famous anatomist used to boast of having opened fourteen bodies and studied them, a feat, if I may so use the expression, which few attempted in his day.

1460 A.D. *Bartholomew Montagnana*, a celebrated professor at Padua, who dissected fourteen subjects.

Among the most learned at this period was *Michael Savonarola*,[1] a professor at Ferrara, who, with characteristic energy, endeavoured to refute the doctrines of Averrhoes, and the prevalent false philosophy which existed in most of the medical schools of his time. Europe was almost devoid of good operators, and good occulists could only be procured in Asia.

1490 A.D. *Michael Savonarola*, an able opponent of the doctrines of Averrhoes.

In the same century several works on materia medica and pharmacy were pub-

[1] He was executed on 23rd May 1498, during the Reformation in Italy.

lished, the most valuable and remarkable of which was that of *Saladin*, a Neapolitan physician of some eminence, while surgery remained "in the hands of barbers and others who could neither read nor write." It is lamentable to contemplate that at this period there was not a single man of note in Europe who could perform surgical operations, the consequence of which was that those who required to submit to surgical operations were obliged to seek the necessary aid in Asia, where they could at least obtain some individuals possessed of considerable manual dexterity.

Mathew Corvin, king of Hungary, having been wounded in battle, published throughout Europe, such was the state of surgery in the West at that time, that he would load with riches and honours any one who could cure him. *Hans de Dockenbourg*, an Alsacian, came to the rescue, and succeeded in restoring to health that monarch, and received the rewards which he so justly earned.

Fifteenth Century. *Hans de Dockenbourg*, an eminent Alsacian surgeon.

The first surgeon who rescued his profession from the clutches of the ignorant barbers at this period was *Leonard Bertapaglia*, a professor of surgery at Padua, who published a commentary on the fourth book of Avicenna, remarkable for its classical instruc-

Fifteenth Century. *Leonard Bertapaglia*, a great surgical reformer.

tion, though his surgical theories abounded in absurdities. The attempt, however, to elevate his profession deserves the highest commendation, and shows that if he himself was not one of the brightest luminaries in the profession, he at least honestly attempted reforms which were much needed.

Though surgery was now in a very languishing state, it must be observed that early in the fifteenth century much credit is due to the Italians for having improved that art. *Vincent Vianco*, *Branco*, and *Bogani* first attempted, and successfully performed the operation of rhinoplastics by cutting from the arm a piece of flesh leaving only a few fibres attached to the extremity, and adapting it to the shape of the nose, maintaining the raw surfaces in contact by bandaging the limb across the face, and dividing the part adhering to the arm when the adhesion became completed.

Fifteenth Century. The operation for restoration of the nose first performed by the Italian surgeons, *Vincent Vianco*, etc.

The operation was afterwards much improved by their countryman, Gaspard Tagliacozzi, by taking the flap from the biceps muscle of the individual.

The most eminent anatomists and surgeons of his time thought it their duty to apologise for this novel operation of grafting, but such was Tagliacozzi's enthusiasm in favour of the

operation, that he maintained that the new nose possessed the sense of smell more acutely than the old one, and not without some success, for he roused the enthusiasm of his fellow citizens to such a pitch that they erected a statue in honour of him, "on which he was represented holding a nose in his hand."

About 1450 A.D. *Basil Valentine,* a German monk, who discovered the use of antimony, etc.

Basil Valentine, a German Benedictine monk, who lived about the middle of the fifteenth century, appears to have studied and practised the medical profession with great assiduity and success. To him we owe the introduction of the internal administration of metallic medicines through his experiments on the nature of antimony.

His experiments, however, upon his brother monks were not attended with the success which he doubtless desired, for he injured most of them more or less, hence the name of the drug is supposed to have been derived from ἀητι-μοναχης. It is to him we are also indebted for the discovery of volatile alkali and its preparation from salammoniac, of the use of the mineral acids as solvents, and the production of ether from alcohol, as well as the sulphate of iron as a tonic.

The most important discovery of this century, or, indeed, of any age, was the art

1450 A.D. The art of printing first discovered.

of printing, which took place about 1450 A.D.[1] This gave a fresh impulse to literature and science, and has since done more for the advancement of science and civilisation than any other known agent, by facilitating the accumulation of knowledge, and rendering it more accessible than ever it was before to those who sought an explanation of the hidden truths of Nature.

1482 A.D. Scurvy first observed in Germany.

Towards the end of this century the scurvy was first observed in Germany in the year 1482,[2] the Sudor Anglicanus, and the morbus petechialis in Italy about the same time.

1493 A.D. Venereal disease first imported from America.

Not long after, another important event took place in the alleged importation of the venereal disease from America by the followers of Columbus, about the year 1493, having given the small-pox in exchange, but there is a considerable amount of discrepancy

[1] Some authorities place the date of this discovery at 1420–1426.

[2] "In 1497 scorbutus, or scurvy, was the acknowledged cause of the dreadful havoc in the crew of 'Vasco de Gama' during a voyage of discovery round the Cape of Good Hope," and the earliest notice of lemon juice as a remedy in this disease is contained "in the third Epistle of Rousseus, dated 1564, wherein it appears that some Dutch sailors who were suffering from scurvy, and the cargo of whose ship, on their return from Spain, consisted of lemons and oranges, accidentally discovered that their use was the means by which they recovered their health."

in the accounts given by various authors as to the time of the first appearance of this disease among Europeans.

1495 A.D. *Marcellus Cumanus*, the first who clearly described the venereal disease.

Marcellus Cumanus, who wrote about the year 1495, appears to have been the first who gave a clear description of the disease, though it is asserted by some that it was known to the earlier writers. This is the most probable view. Albucasis and Avicenna mention ulcers and warts upon the penis; and Gulielmus de Saliceto, in 1280, described buboes caused by disease of the penis from impure intercourse, besides several other authors. *Alexander Benedetti*, a professor at Padua, greatly distinguished himself in the improvement of anatomy and surgery about the close of this century, and many religious and political changes were effected, if not calculated to develop the reasoning faculties of man, at least tended to maintain the spirit of inquiry which was roused by the force of events.[1]

About 1490 A.D. *Alexander Benedetti*, a zealous anatomist and surgeon of this period.

About 1490 A.D. *Germain Colot*, the first who established the performance of lithotomy by surgical practitioners.

Towards the close of the fifteenth century, *Germain Colot*, a French surgeon, high in

[1] It was about the middle of this century that the Turks captured Constantinople, by which the last remains of the Eastern Empire was overthrown, and the multitudes of Christians who fled from that city into Italy rescued numerous valuable manuscripts containing the stores of Grecian poetry, history, philosophy, and medicine.

favour with Louis the Eleventh, acquired a wide renown in the operation of lithotomy, having had an opportunity of witnessing its performance by an itinerant at Milan. He first practised it upon the dead body, and subsequently successfully performed it upon a condemned criminal, who consented to submit to the operation on condition that a favourable issue should result in his pardon. Colot skilfully performed his task and saved the man's life, thereby enhancing his own reputation far beyond his most sanguine expectations.

1495 A.D. *Nicolas Leonicus*, a celebrated Venetian physician, and translator of the works of Hippocrates.

Another name worthy of mention in connection with the termination of this century is that of *Nicolas Leonicus*, of Venice, a distinguished professor at Padua and Ferrara, who taught there for upwards of sixty years. Being an excellent Greek scholar and great admirer of Hippocrates, he devoted a large share of his time and attention in promulgating the doctrines of the "Father of Medicine." He also translated the works of that great master into Latin, and delighted in expounding upon them in his lectures. At the same time he did full justice to the theories of the Arabian physicians where he considered they merited praise, and effected much in advancing and improving the taste

for medical studies which had been gradually "ebbing away and flowing towards the schools of France."[1]

We have now to take a sudden flight from the Continent, and its hosts of able workers, towards our own shores, where, shortly after the time of Leonicus, we find the celebrated and erudite *Thomas Linacre*, of Canterbury, physician to Henry VIII., also engaged in promulgating the Hippocratic doctrines. Having frequented the Italian schools, and by diligent application he became a splendid Latin scholar, at any rate so far as this country is concerned, for he was the first person in England who employed the Latin language in his writings. But he must have been an equally good Greek scholar, for he published a translation of the works of Hippocrates into Latin. He founded a chair of Hippocratic and Galenical medicine at Oxford and Cambridge, and materially assisted in establishing the Royal College of Physicians of London, services to

About 1484 A.D. *Thomas Linacre*, the first English physician who used the Latin language in his writings, and founder of the London College of Physicians.

[1] In the beginning of the sixteenth century (1514), a severe epidemic of pleurisy raged in Paris when Pierre Brissot, one of the ablest physicians of that city, boldly advocated the local abstraction of blood from the immediate neighbourhood of the part affected, but met with an equally able opponent in Victor Trincavelli, a Venetian physician, who wrote exclusively against this system of "derivation."

science and the profession deserving of being handed down to posterity with lasting gratitude.[1]

Sixteenth Century. About 1500 A.D. *Gonthier*, a French translator of Galen and Hippocrates. *Cornarus*, a German translator of the same.

The stimulus given by Leonicus and Linacre to medical literature soon produced good results. *John Gonthier*, of Andernach, a professor of the Faculty of Paris, translated Galen and Hippocrates; and in Germany, *Cornarus* also rendered a good translation of the same, and refuted with great vigour the false philosophy of the Arabian school.

The Parasian and Italian schools were at this period represented, the former by *Sylvius* and *Fernelius*, and the latter by *Fracastorius* and *Mossa*. Fernelius refuted the humoral pathology of Galen, and sowed the first seeds of solidism which was afterwards embraced by the school of Hoffmann. His disciple, *Lommius*, who practised at Brussels with great distinction, published an excellent work entitled "*Observationes Medicinalis*," on the basis of the Hippocratic doctrines.

About 1500 A.D. *Fernelius*, the first who refuted the humoral pathology of Galen.

About 1510 A.D. *Botal*, a Piedmontese physician, who bled profusely in internal disorders, and discoverer of the foramen ovale of the fœtal heart.

Another disciple, named *Botal*,[2] a Pied-

[1] John Kaye, born at Norwich in 1510, succeeded Linacre, and founded the only medical college existing at Cambridge. Like Linacre he was a most studious and learned man, having studied Greek and medicine in Italy.

[2] Botal, though a comparatively obscure anatomist, deserves the credit of having had his name connected with the opening which exists during fœtal life between the two

montese, and chief physician to Charles IX. and Henry II. of France, distinguished himself by recommending profuse bleeding in internal diseases, while his confreres *Duretus* *N. Piso* and *Hollerius*[1] (French physicians), exercised greater caution, according to the precepts promulgated by Hippocrates, of whom they were warm admirers.

De Garræus and *Fœsius, of Dijon*, as well as *Forestius* and *C. Piso*, were also zealous supporters of the Hippocratic medicine. These were followed by a vast number of editors, commentators, and scholiasts, who, during this century, were engaged on the writings of Hippocrates and Galen, whose teachings they considered oracular. The most distinguished among them were *Zwinger, of Basle*, in Switzerland, *Mercurialis* (1533 A.D.), *Amatus Lusitanus*, and *Prosper Alpinus*, who published an excellent account of the medicine of the Egyptians in

Zwinger, of Basle, a distinguished writer on practical medicine.

auricles of the heart, viz., the *foramen ovale*. According to Portal, however, he did not discover the opening, for it was known to Galen, and it was *Carcanus, of Milan*, the discoverer of the *ductus arteriosus*, who first named it the foramen of Botal, which was accepted by Morgagni, Senac, and Haller.

[1] Pierre Brissot, another eminent French physician of this period (1514), strongly advocated the derivative system of bleeding, which was ably opposed by Victor Trincavelli in 1587.

the year 1553. *John Argentier*, a Piedmontese physician, who taught at Pisa, Naples, and Turin, distinguished himself by advocating reforms in the system of teaching, inculcating the importance of observation and experience as the basis of rational medical teaching; and found able supporters in different universities, amongst whom may be mentioned the two celebrated professors *Laurent Joubert* and *Guillaume Rondelet, of Montpellier.*

Astrology and theosophy were taught during this century in the most celebrated schools of Europe, aided and abetted by the systems of the alchemists, that even the greatest minds could not divest themselves "of this deplorable contagion," which found further advocates in Paracelsus and Van Helmont.

About 1493–1541 A.D. *Paracelsus*, the first who used mercury internally, and introduced chemical remedies into medicine, and withal a vain and foolish philosopher.

Paracelsus, born about the year 1493 A.D., near Zurich, in Switzerland, flourished about the middle of the sixteenth century, than whom probably a greater quack never lived. His real name was Philip Hochener, which he changed to *Philippus Aureolus Theophrastus Bombastus Paracelsus*, a cognomen quite characteristic of the man. His early education was of the most scanty nature, yet he appears to have been a man of some

attainments, for he travelled a great deal, even into Asia and Africa, maintaining himself probably by quackery; nevertheless his influence must have been considerable, for it is said that, on account of his knowledge of chemistry, he was consulted by all the great men of his day.

When only thirty-three years of age he boasted of having cured thirteen princes of different ailments; and on his return to his native country he was appointed professor of medicine and chemistry at Basle, in Switzerland. The first act of his career in this capacity was to publicly burn the works of Galen, exclaiming that "Galen did not know as much as his shoe latchets;" that "reading never made a physician;" and that "countries are the leaves of Nature's code of laws, patients his only books."

He was, however, one of the first who introduced chemical remedies into medicine. His opinion of antimony was, that it was the most efficacious substance in Nature. He was also one of the first who used mercury internally.[1] He administered lead internally

[1] "Mercury was first used externally in syphilis as early as 1497, but Paracelsus first gave it internally, and upbraided physicians for depending on guaiacum and China root;" and also pointed out that syphilis modified other diseases by its presence.

in fevers, and prepared red precipitate with mercury and aqua fortis. He held that the human body is composed of salt, sulphur, and mercury, and that in these "three first substances" health and disease consist, followed by a great deal of foolish rhapsody on the causes of diseases. His boundless vanity culminated in the assertion, that Hippocrates was produced by the genius of Greece, as *he* was by that of Germany; adding, that "all the universities united had not as much knowledge as his beard, and that the hairs of his forehead had more instruction than all writers put together."[1] His ending, as might have been anticipated of such a man, was disastrous. He was expelled from Basle for disorderly conduct, and took again to a wandering life, exciting the hatred and jealousy of the faculty wherever he went. At Salzburg "he was pitched out of the window at an inn by the doctors' servants, and had

[1] Andrew Boorde or Borde, a contemporary, and native of Penvensy, in Sussex, and a student of Oxford, who graduated at Montpellier in 1541, was no less an eccentric character than Paracelsus. It is said that he frequented markets and fairs, where he was wont to collect crowds about him by delivering humourous speeches and prescribing for the multitudes, hence the derivation of the name "Merry Andrew." His "Dietary of Health" "is one of the most amusing and interesting books of the sixteenth century."—Meryon's "History of Medicine."

his neck broken by the fall. This occurred in the year 1541," and notwithstanding that, according to his own account, he possessed a universal medicine which would secure him immortality, he died in an inn at Salzburg at the early age of forty-eight.[1]

"The first book on anatomy after that of Mondinus was by *Gabriel de Zerbi, of Verona,* who taught in the University of Padua about the year 1495. The title is "Liber Anatomiæ Corporis Humani et singulorum Membrorum illius, 1503." Hallam asserts that Zerbi foreshadowed the discovery of the fallopian tubes and ligaments of the uterus (ligamentum rotundum excepted), and was the first to describe the puncta lachrymalia of the eyes, though Berenger de Carpi has the credit of having done so.

1502 A.D. *Gabriel de Zerbi,* discoverer of the fallopian tubes, puncta lachrymalia, pigment of the iris, and olfactory nerves.

He also discovered the oblique openings of the *ureters* into the bladder, and is said to have first described the uvea or pigment of the iris, and the olfactory or first pair of cranial nerves.

His contemporary, *Achillinus,* professor of philosophy and medicine in the University of Bologna, and called the second Aristotle,

1516 A.D. *Achillinus,* the first who correctly described the valve of the cæcum, the common bile duct, and the termination of the spinal cord, etc.

[1] See works of Paracelsus; also of Schultz, 1831; also Russell's "History and Heroes of Medicine," 1861; and Ree's "Encyclopædia."

gave the first description of the valve of the cæcum and vermiform appendix, the termination of the ductus communis choledicus in the duodenum, the Whartonian ducts, the veins of the arm, the malleus and incus of the ear, the infundibulum of the brain, the fourth pair (trochleatores) of cerebral nerves, and the termination of the spinal cord at the first lumbar vertebra in the cauda equinæ.[1]

1518 A.D. *Berenger de Carpi*, one of the most eminent anatomists of the Sixteenth Century.

The greatest discoveries which occurred during the sixteenth century were undoubtedly those which took place in anatomy. Numerous zealous workers dissected and carefully studied every part of the human body, among whom may be especially mentioned *Berenger de Carpi*, who dissected more than one hundred bodies—something marvellous when we consider the age in which he lived — and who made several discoveries in that branch. To him is attributed the first correct description "of the grastro-colic omentum and transverse mesocolon, the valvulæ conniventes of the intestines, the relative proportions of the thorax and pelvis in man and woman, the flexor brevis pollicis, the vesiculæ seminalis, the separate cartilages of the larynx, the membranous pellicle in front of the retina,

[1] See Portal's "Hist. d' l'Anatom.," etc., pp. 270 and 271.

attributed to Albinus, the tricuspid valve between the right auricle and ventricle of the heart, the semilunar valves at the commencement of the pulmonary artery, the inosculation between the epigrastric and mammary arteries, and an imperfect account of the cochlea of the ear." [1]

About the same period, 1532, *Rhodion* greatly improved the science and art of obstetrics, and *Nicolas Masson*, in 1536, demonstrated the peritoneum to be a short sac formed of one continuous membrane, while *Charles Etiene*, in the same year, drew attention to the existence of the nutritious foramina of bones, described the ligaments which connect bones together, the vomer, the transversales perinæi muscles, the three branches of the fifth pair of cranial nerves, the distinction between the pneumogastric and sympathetic nerves, the canal of the spinal cord, and the valves of the veins.

1532 A.D. *Rhodion*, an eminent obstetrician.

1536 A.D. *Nicolas Masson.*

1536 A.D. *Charles Etiene*, celebrated anatomist, who first described the foramina nutritia of bones, etc.

James Dubois, latinised Sylvius, and master of the great Vesalius, was the true founder of anatomy in France, and the first who injected the blood-vessels. His disco-

1540 A.D. *Sylvius*, the first who injected the blood-vessels, etc.

[1] "Sprengel," Vol. III., page 399, gives him the credit of having, besides being a learned anatomist and surgeon, improved and simplified the treatment of wounds of the scalp.

veries comprise a description of the pterygoid and clinoid processes of the sphenoid bone, the os unguis, the transverse and oblique processes of the vertebrae, the obliquus externus and transversalis abdominis, the muscles attached to the hyoid bone, the valves in the veins of the extremities, and the jugular vein.

About the same period *Leonhard Fuchs* described the medicinal properties of digitalis purpurea; and *John Fernel*, in 1542, gave an accurate description of the ligaments, and of the venous system.

1543 A.D. *Vesalius*, the first who published anatomical plates taken after nature.

But it remained for *Andreas Vesalius*, one of the most accurate anatomists, and author of the first anatomical plates taken after nature, to give the first correct description of the osseous and muscular systems. He discovered and described the pterygoideus internus muscle, the chordæ vocales of the larynx, the glandular structure of the stomach, the vena azygos, the coronary arteries of the heart; as also the obturatores, the spermatic, gastro-epiploic, splenic, and subclavian arteries, the vestibule of the labyrinth of the ear, the cervical and sacral plexuses of nerves, the appendix vermiformis, arbor vitæ of the cerebellum, and the pineal gland, and also drew attention to the ova of De Graaf.

1544 A.D. *Ingrassias*, an eminent aurist.

In 1544 *Ingrassias* described the two tympanic foramina, the fenestra ovalis and foramen rotundum, the "chorda tympani," the mastoid cells, the cochlia and semicircular canals as forming part of the ear, as well as the structure and function of the vesiculæ seminalis.

1546 A.D. *Servetus*, a celebrated anatomist and preceptor of Harvey.

Michael Servetus, also a famous anatomist of the same period, appears to have understood the lesser circulation, or that through the lungs, thus foreshadowing the greatest discovery in the history of medicine, viz., that of the circulation of the blood, which was reserved for another. Some of his notions, however, were rather peculiar. He held that the soul existed in the blood, and that the devil got into the brain through the nostrils.

In 1553 *Columbus* drew attention to the stapes of the tympanum and bursae *mucosæ*, and in the following year *Rondolet* first described the ilio-colic valve. And in 1561 *Fallopius* discovered the aqueduct of Fallopius containing the chorda tympani, and described the occipitofrontalis, the pterygoideus externus, the genio-hyoideus, and all the muscles between the os hyoides and lower jaw.

1561 A.D. *Fallopius*, discoverer of the aqueduct of Fallopius.

In the same year *Vidus Vidius* described the corpora aurantia contained in the semi-

lunar valves of the heart, the vidian canal for the transmission of the vidian nerve, and the aqueduct of Sylvius leading between the third and fourth ventricles of the brain.

1563 A.D. *Eustachius*, discoverer of the Eustachian tube, of the tympanum and thoracic duct, etc.

Eustachius, in 1563, described the structure of the teeth, the peculiar arrangement of the glandular portions of the kidneys, the Eustachian tube of the tympanum, the thoracic duct, and the Eustachian valve between the openings of the superior and inferior venæ cavæ; and in 1564 *Ronesseus* suggested the use of lemon juice as a prophylactic and curative agent in scorbutus.

1564 A.D. *Ronesseus*, the first who suggested the use of lemon juice in scurvy.

1574 A.D. *Fabricius*, the first who gave a correct description of the valves of the veins.

Fabricius ab Acquapendente, a distinguished professor at Padua, in 1574, first gave a correct description of the proper function of the valves of the veins. This eminent physiologist and surgeon further contributed to the advancement of his art by introducing the modern trephine and the use of the tube after tracheotomy.

His "Opera Chirurgica" passed through several editions, showing its importance and the estimation in which it was held, for he not only produced a summary of the state of surgery in his time, but also promulgated important improvements and discoveries of his own.

About the middle of the sixteenth century

1535–1590 A.D. *Ambrose Paré,* the most celebrated French surgeon of the Sixteenth Century, and the first who treated systematically of gunshot wounds, and used the twisted suture in harelip.

Ambrose Paré, a celebrated French surgeon, gave a fresh impulse to surgery, which had sadly deteriorated since the time of John of Arden. The practitioners of that craft at this period consisted of barbers, farriers, sow gelders, cobblers, and tinkers, and strange to say this practice continued both in England and France for upwards of two hundred years. Ambrose Paré himself was quite satisfied at being designated the barber surgeon, and seems to have thought that there was nothing derogatory in the title. He was surgeon successively to Henry II., Francis II., Charles IX., and Henry III. of France, and accompanied the French armies "in all their campaigns, down to the Battle of Moncontour in 1569." His great experience in this respect rendered him an authority on gunshot wounds, in the treatment of which he revived and improved the method of arresting arterial hæmorrhage by the application of ligatures, instead of the clumsy and barbarous use of styptics and cauteries, which had been in vogue prior to his time. In this branch of his art he was ably supported by *Maggi Leone,* a professor at Pavia; *Botal,* the anatomist; *Felix Wurz,* a German surgeon; *Guillemeau,* one of his own pupils, and many others.

Paré's treatment of gunshot wounds, however, met with the strongest opposition from his professional brethren, who were either jealous of his success, or ignorant of the merits of his practice, and to such an extent was this carried that, in order to shield himself, he was wont to give incorrect extracts from Galen and other ancient writers, in proof of that to them, not to him, the merit of the invention referred. Future fame, however, amply recompensed him for all the opposition which he endured. His popularity with the army was such that he was actually adored. "On one occasion, his mere presence among the garrison of a beleaguered city about to capitulate, reanimated the troops to such an extent that their resistance became more energetic than before, and the besieging army perished beneath the walls."

"From the general massacre on the fearful night of St Bartholomew, he was rescued by the personal exertions of Charles IX.; his great merits being appreciated even by that weak and cruel monarch."

He was the first who used the twisted suture in harelip, the mode of application of which he copied from the tailors and fair sex of his day, who wound the thread round

the needle and carried them safely in their cuffs or caps. His most famous treatise is that on gunshot wounds, these murderous weapons, cannons and firelocks, not having been then long in use. His works were published in 1535, and again more fully in 1582, and for a time exerted a great influence upon the profession, though after his death surgery once more lapsed into a state of comparative barbarism.

About 1580 A.D. *Chaumette* and *Clowes*, two eminent writers on gunshot wounds and syphilis.

Two authors of some note on surgical subjects deserve some notice here, viz., *Anthony Chaumette*, and *William Clowes*. An eminent English surgeon of Queen Elizabeth's time, the former published a complete treatise on surgery, bearing especially on syphilis and gunshot wounds—two of the most important subjects which occupied the attention of surgeons in the sixteenth century. The latter accompanied the Earl of Leicester's army in the low countries, and wrote on gunshot wounds. He also published "a short profitable treatise on the morbus gallicus, or syphilis; and early in the seventeenth century a right faithful and profitable treatise on the king's evil."

Paré's immediate successor, *Pigrai*, or *Pigray*, endeavoured to follow in his master's footsteps, but possessing neither originality

nor genius, surgery made no advance until again revived early in the seventeenth century by *Cæsar Magatus*, who simplified and improved upon Paré's treatment of wounds.

About 1600 A.D. *Cæsar Magatus*, a successor of Paré's, who simplified the treatment of wounds.

Since the introduction of syphilis, diseases of the urinary organs attracted greater attention than they had previously done. It was customary at this period to introduce bougies of wax or lead for the purpose of dilating the urethra, but after a clumsy fashion. One of the first successful recorded cases under this treatment was that of Henry III. of France, who, having contracted a stricture of the urethra in Venice on his return from Poland, was cured by *Mayerne, of Venice*, who introduced plaster bougies for the purpose of dilating the canal, and succeeded in restoring his royal patient to health.

About 1600 A.D. *Mayerne*, a famous physician of Venice, who first cured stricture of the urethra by the introduction of plaster bougies.

We shall now shake hands with the past, and enter upon a new era by introducing the name of one of the brightest ornaments that ever graced the profession, and whose fair fame shall never die, as having been in fact the true founder of all our physiological knowledge, and, perhaps indirectly, one of the greatest benefactors of mankind.

1619 A.D. *William Harvey*, the discoverer of the circulation of the blood.

William Harvey, born at Folkstone, in Kent, on the 1st of April 1578, was successively physician to James I. and Charles

II. of England, and professor of anatomy at the Royal College of Physicians of London. In 1615 he was appointed Lumleian lecturer to the same school, an office then held for life, and it is supposed that in his first course of lectures in the spring of 1619 he first disclosed to his pupils his original views of the mechanism of the circulation of the blood; but it was not until 1628 that he published his celebrated treatise entitled "Exercitatio anatomica de motu cordis et sanguinis." Having studied medicine at Cambridge, and afterwards at Padua, then the most famous school in the world, he must have been well equipped for the distinguished career which he afterwards enjoyed.

His great discovery met with the greatest opposition from all the most eminent men of his time, "and it was remarked by Hume, as evidence of obstinate adherence to preconceived opinions, that no physician in Europe who had reached forty years of age ever to the end of his life adopted Harvey's doctrine of the circulation of the blood." One exception must, however, be made to this, for the famous anatomist of the Faculty of Paris, *John Riolan*, though at first a strenuous opponent of Harvey's views, ultimately became one of its warmest advocates.

About 1620 A.D. *John Riolan*, a distinguished Parisian physician, and the first convert to

Harvey's doctrine of the circulation of the blood.

Our illustrious physiologist did not end here. The grasp of his powerful intellect drew him into a new sphere, where, if he was less successful in the field of discovery, he at least found abundant pabulum for the display of his intellectual resources. Always a charming writer, his fluency and facility of expression came out very prominently in his other great work, entitled "Exercitationes de generatione animalium quibus accedunt quaedam de partû de membranis ac tumoribus uteri, et de conceptione." 4to.[1]

1659 A.D. *Cesalpino*, an Italian claimant to the discovery of the circulation of the blood.

Of late the Italians have been claiming the discovery of the circulation of the blood for their countryman *Andrea Cesalpino, of Arezzo*, in Tuscany, who, in 1569, according to *Doctor Giulio Ceradini*, professor of physiology in the University of Genoa, "discovered the physiological and continued passage of the blood from the arteries to the veins across the capillary anastomosis in all parts of the body, and defined by circulation the perpetual motion of the blood from the veins to the right heart, from this

[1] The best English edition of his works is that of Dr Willis, published by the Sydenham Society in 1847. His contemporary, Paul Zacchius, was the first who published a treatise on Medical Jurisprudence, in 1621, having collected materials from 460 authors.

to the lung, from the lung to the left heart, and from the left heart to the arteries; producing, in the year 1593, the experimental proof of the circulation, in the fact that the veins when tied in any part of the body swell between their original capillaries and the ligature, and, when cut, let out first the black venous blood, then the red arterial blood," and that Harvey's greatest merit consisted in "having sustained and won a battle against ignorance and prejudice by divulging the discovery of Cesalpino."

Now without detracting from the merits of Cesalpino, who evidently had a very fair idea of the circulation, every impartial observer must admit that the preponderance of evidence is in favour of Harvey. Even if Cesalpino had been the actual discoverer of the circulation of the blood, the Italian professor and his friends are irrational in adopting the following concluding sentence in their inscription to his memory: "Male sibi consuluit Harveius ille anglus, hanc qui sibi maximi veritatem momenti ausus anno MDCXXVIII. est decernere;" which means, "Ill advised was the English Harvey who, in 1628, dared to arrogate to himself the discovery of this mighty truth."

Mr Sampsom Gamgee, in the *Lancet* of

11th November 1876, gives a very good summary of the historical evidence on this subject. He says: "Cesalpinus was born at Arezzo, in Tuscany, in 1519, and died in Rome in 1603, his chief works having been published from 1569-1593. William Harvey was born in 1578, went to Padua in 1598, returned to England in 1602, was appointed lecturer on anatomy and surgery to the College of Physicians in 1615, published his 'Exercitatio anatomica de cordis et sanguinis motu' in 1628, and died in 1657. Thus Cesalpinus' work was accomplished before Harvey's had begun." And still more significantly he asks, "How was it that after he (Harvey) left Padua, the great theme of discussion was 'De Paradoxa Harvejano'? Why did John Rolan, the learned professor of the University of Paris, specially confute? Why did Leichner, in 1646, entitle his essay 'De motu sanguinis, Exercitatio Anti Harveiana'? Why did Zacharia Sylvius, in 1648, say, in the preface to his edition of Harvey's work, 'Novam quandam et inauditam de motu cordis et circulatione sanguinis sententiam'?"

Thus it would appear that his contemporaries learned the doctrine, at least, from Harvey. And as he acknowledges the labours

of his predecessors, it is extremely probable that he was altogether unacquainted with the works of Cesalpinus, of whom he makes no mention.

No doubt the Italians shall continue to adhere to their views of the subject, and we shall as rigidly uphold the claims of our own hero, while probably the truth lies between the two, viz., that both conceived the idea of the mechanism of the circulation of the blood independently of each other, though the verdict of history is in favour of Harvey.

Claims of priority of a similar nature among scientific men have always prevailed, and no doubt will continue so as long as the craving after fame constitutes the chief stimulus to hungry minds in conducting original research; and it is not always an easy matter to settle the merits of rival claimants, especially when they belong to different, and antagonistic schools. Even within the last twenty-five years we can recall to memory several knotty questions that might still find advocates on either side. As familiar and apposite examples, which I quote from memory, may be mentioned the discovery of "Leucocythemia," or "Leukhemia," claimed alike by the late John Hughes Bennet, of Edinburgh, and Virchow,

of Berlin; the pathology of articular cartilage, disputed between Goodsir and Redfern; and the American claim to the discovery of the use of anesthetics prior to the introduction of the use of chloroform in this country.

1628–1661 A.D. *Malpighi*, a celebrated anatomist and physiologist, and the first to demonstrate microscopically the course of the blood corpuscles in the minute vessels.

The important step in advance made by Harvey was soon followed up by *Malpighi, of Bologna*, who demonstrated microscopically the course of the corpuscles of the blood in the minute vessels, and "corroborated the fact of the communication between the veins and the arteries." This celebrated anatomist also studied minutely the structure of the heart and lungs, of the brain and its membranes, and first drew attention to the Malpighian bodies of the spleen and kidneys.

Other zealous observers were also busy making anatomical discoveries about the same time, especially *Bartholin, Lower, Steno, Swammerdam, John Mayow, Borelli, Bellini,*[1] *Pitcairn, Raymond Vieussens*, and

[1] The doctrines adopted at this period in order to explain the functions of the human body were derived from the sect of mathematical physicians, who ascribed them to mechanical principles. The leader of this sect was Borelli, then professor of mechanics and anatomy at Pisa. Under him and Alexander Marchetti, professor of mathematics, Bellini studied and imbibed their opinions. Both he and Borelli likened the human body to a collection of tubes forming a hydraulic machine, calculated the force of the circulation of the blood and other fluids through them, making allowances

Gerard Blaes, most of whom distinguished themselves in their researches on the anatomy of the brain, and last, but not least, *Thomas Willis*, who published a treatise on the brain and the nerves connected with it, and whose name is connected with that remarkable anastomasis between the branches of the vertebral and internal carotid arteries within the cranium forming the *Circle of Willis.*

1628–1659 A.D. *Thomas Willis*, a distinguished English anatomist, who first described the circle of Willis in the brain.

J. J. Wepfer also traced the course of the blood-vessels of the brain with greater minuteness than his predecessors had done. *Gerard Blaes* described the spinal cord with considerable accuracy, and *Francis Joseph Burrhus*, after subjecting the brain to chemical analysis, found it to be composed of twenty-five per cent. of a fatty matter analagous to spermaceti.

Gaspard Aselli, about this period, first

1640 A.D. *Gaspard Aselli*, the discoverer of the lacteal vessels.

for the diminished velocity of their course arising from the friction along the sides of the vessels, etc. The propelling force was not, in their opinion, solely mechanically, but arose from a fermentation in the blood, by which certain animal or vital spirits were disengaged, which forced the blood along the channels of the blood-vessels. In his opinion the sole object of respiration was to push the blood into the capillary or extreme vessels with an adequate amount of force. His theories respecting secretion and inflammation had a considerable influence upon practice during his life-time, and for nearly a century afterwards, some of them having been adopted by Bœrhaave.—"Penny Cyclopædia."

discovered the lacteal vessels in animals, which led to the discovery of the lymphatic glands.

1621–1698 A.D. *Hoffman*, the discoverer of the duct of the pancreas.

Maurice, or *Moritz, Hoffman* discovered the excretory duct of the pancreas in a Guinea fowl, and so did *John George Wirsuny*, and shortly afterwards *Pecquet*, in 1647, discovered the common trunk of the lacteal and lymphatic vessels. He also made known the true course of the chyle (which had previously been supposed to enter the liver) before entering the general circulation.

1650 A.D. *Thomas Wharton*, the first who gave a general description of the glands.

Thomas Wharton first gave a general description of the glands, mentioning those parts of the body which, in their structure, belong to that class of organs. To the anatomist his name is familiar in connection with the duct of the sub-maxillary gland, and though his observations were erroneous as to the structure and functions of the glands, he rendered good service to the cause of anatomy.

The doctrines of *Van Helmont Paracelsus* and *Sylvius de la Boc*, a professor at Leyden, exercised a considerable influence upon physicians about this period, rendering them little more than a mixture of superstition and a belief in witchcraft, and the possibility

of holding correspondence with the devil. "The application of mathematics to astronomy by Kepler, and to the laws of motion, as well as to the system of the world by Newton, led to the opinion that its powers were irresistible, and that it might unfold every secret of Nature." In the course of the same century *Galileo* introduced mathematical reasoning, and *Lord Bacon* propounded the method of inductive reasoning, which created a spirit of inquiry for observation and experiment, enhanced by the observations of *Newton*, *Kepler*, *Descartes*, and *Scheiner* on the properties of the different parts of the eye in relation to vision; the latter demonstrating that "the retina is the true organ of sight."

1650 A.D. *Scheiner*, the first who pointed out the retina to be the true organ of sight.

Numerous researches were also now undertaken by various physiologists on generation, amongst whom may be mentioned *Leeuwenhœk*, *Hartsoeker*, *Charles Drelincourt*, *B. Ruysch*, *J. J. Rau*, *Spigelius*, *Sanctorius*, and others, who not only contributed to the advance of physiology, but secured for themselves a permanent fame in the history of science.

A Scotchman, of the name of *Lowe*, in 1612, published a discourse on the whole art of chirurgery. But the true father of

1676 A.D. *Wiseman*, the true father of British surgery.

British surgery was *Richard Wiseman*, aptly designated the Paré of England. This eminent surgeon was sergeant surgeon to Charles II., whom he accompanied during the civil wars, during which troubles he had abundant opportunities, as his works testify, of laying up stores of knowledge for the benefit of his successors.

He published no less than eight surgical treatises full of interesting information and instruction, remarkable for the time in which he lived.

In military surgery he strongly recommended primary amputation in cases of severe injury, where the saving of the part affected appeared improbable, "while the patient is free of fever;" and it was not until his time that surgeons could be induced to believe that gun-shot wounds were not necessarily envenomed by the powder, thereby not requiring the cruel dressings that had been in vogue anterior to his time.

About 1679 A.D. *James Young*, the first who recommended amputation by a flap.

Another British surgeon and contemporary of Wiseman's was *James Young*, a surgeon practising in Plymouth, who appears to have been a man of considerable ability and originality, having written in 1679, and to whom we are indebted for having first proposed amputation by a flap. He was also the first

to recommend limited compression of the main artery in amputation.

Germany at this time also produced several surgeons of some note. *Fabricius Hildanus*, an eminent practitioner, and author of a surgical treatise dated 1641; *Scultetus*, author of a work entitled "Armamentarium Chirurgicum," 1653; *Heister*, a professor in the University of Helmstadt, published a system of surgery which has been translated into most of the European languages; and *Rau*, a native of Germany, though a professor at Leyden, "was perhaps the most successful lithotomist that ever lived." This learned leech and accomplished operator, having been taught by the Frère Jacques, kept his method of operating a profound secret, even from his own pupils, which his more liberal confreres Heister and Albinus found it impossible to indue him to divulge.

1641 A.D. *Hildanus* and *Heister*, two eminent German surgeons.

About 1650 A.D. *Rau*, a professor at Leyden, and one of the most successful lithotomists that ever lived.

The advance of anatomical knowledge about this period gave a great impetus to surgery as well as to the other branches of the profession, and we find a host of names whose labours have been perpetuated by their discoveries.

Conrad Victor Schneider, a German anatomist and writer, has his name indelibly associated with the mucous membrane of

1660 A.D. *Schneider*, a German anatomist, whose name is associ-

ated with the mucous membrane of the nose.

the nose; *Francis Glisson*, through his researches on the anatomy of the liver; *Sanctorius*, the author of aphorisms on Italian medicine; *Michael Etmuller*, father and son (Germans), wrote in the various departments of medicine; *Francis Mauriceau*, the eminent French accoucheur; *Régnier De Graaf*, of Holland, renowned for his researches on the sexual functions of woman, and whose name has been preserved to posterity in connection with the Graafian vesicles of the ovary, besides many others of less note.

1668 A.D. *Mauriceau*, one of the earliest eminent French accoucheurs.

1670 A.D. *De Graaf*, the eminent Dutch physiologist, who discovered the Graafian vesicles of the ovary.

Towards the end of this century the following familiar names also appear: *Meibomius*, the celebrated anatomist, who published a work on the anatomy of the eyelids; *Peyer*, the discoverer of the agminated glands, or glands of Peyer, in the ileum and lower portion of the jejunum, having discovered and described them in 1677; *Fredrick Ruysch*, 1638–1731,[1] who is said to have been one of the first who made anatomical preparations by means of injections; and *Bidloo*, a professor at Leyden, who, in 1685, published "his celebrated anatomical folio with 105 magnificent plates."

1672 A.D. *Hugh Chamberlain*, the inventor of the obstetric forceps.

In obstetrics, *Hugh Chamberlain* invented the obstetric forceps, which he kept a pro-

[1] Cates' "Dictionary of General Biography."

found secret for purposes of self-aggrandisement; and *Julian Clement*, a distinguished French accoucheur of the same period,[1] by his skill and influence, "was the means of having men employed instead of women to officiate in cases of childbirth." It is said, however, that the midwifery practitioners of this century did little more than "copy the obstetrical work of *Eucharius Rhodion*, which was 'set forth in Englishe by Thomas Raynalde, phisition,' entitled 'The Byrthe of Mankynde,' which was the first book published on that subject, in 1540, and generally known as Raynalde's work."

1676 A.D. *Julian Clement*, the first who advocated the employment of men instead of women in obstetric practice.

And lastly, the century ended with the brilliant names of Sydenham, Morton, Baglivi, and Bœrhaave.

Thomas Sydenham, the English Hippocrates, was born in 1624, at Winchford Eagle, in Dorsetshire, and was educated at Oxford, and, according to Dessault, he afterwards studied at Montpellier. Having afterwards settled at Westminster, his success was so great that, at the early age of thirty-six,

1624–1689 A.D. *Sydenham*, an eminent English physician, styled the English Hippocrates, a great authority on fevers, and the first who applied a rational method of treating the small-pox.

[1] Later on William Smellie (1697–1763) and Thomas Denman (1770), two of the most eminent accoucheurs of the eighteenth century, greatly improved and advanced the science and art of midwifery. According to Dr Hulme, Edward Strother (1718) was the first who used the term "puerperal fever," and phlegmasia dolens was noticed by Castro in 1603.

he was considered one of the first men of his time. Though not a profound man of science, his sagacity, powers of observation, and accuracy in diagnosis, foreshadowed an intellect of no ordinary capacity. "His philosophic cast of mind secured for him the admiration and friendship of Locke, and his labours were highly extolled by Boerhaave and Haller."

At an early period of his professional career he took up the subject of fevers, and, in 1666, not long after he had been in practice, he published his celebrated treatise, entitled "Methodus curandi Febris Propriis Observationibus Superstructa," but perhaps his best work was his "Opera Medica," which has passed through several editions both in this country and in America, the most approved edition of which was that which appeared at Geneva in 1716.

Among the improvements which he brought about in practice may be mentioned his treatment of the small-pox, which consisted of an antiphlogistic method of cool air and salines, instead of the stimulating regimen of almost universal application which existed before his time. He died on the 29th December 1689.[1]

[1] The best English translation of Sydenham's works is that of Dr R. G. Latham, published in the Sydenham Society's series, to which he gives its name.

Early in the eighteenth century, Stahl, Hoffmann, and Bœrhaave introduced three different systems of physic, which excited a considerable influence upon the profession until within very recent times. The theory of *Stahl* was the first which appeared, and for a long time held sway in Germany. He attributed the governing of the whole animal economy to the rational soul of man, and the power of Nature, or the *vis medicatix naturæ*, he referred to the same source. And not only that, but he believed that the soul often acted independently of the state of the body, in consequence of its intelligence respecting the disorders of the system, and that in this way it excited certain motions of the body by which the injurious effects of disease might be obviated. His pathology was founded upon two conditions, viz.: plethora or fulness, and cacochymia, or a depraved condition of the humours—in short, an essentially humoral pathology.

1660–1734 A.D. *Stahl*, an eminent professor in the University of Halle, who propounded the theory that the power of Nature existed in the rational soul, and supported the doctrine of a humoral pathology.

Fredrick Hoffmann,[1] on the other hand, promulgated an entirely different system. Though both had been professors at Halle, in which place the latter was born, in 1660, the doctrines of the one had evidently little

1660–1742 A.D. *Fredrick Hoffmann*, a professor in the same University, who ascribed the production of disease to nervous influence.

[1] A remarkable circumstance in connection with him was that he never took fees from patients.

effect upon the independent line of thought which the other adopted. The peculiarity of Hoffmann's system was that the nervous system was the prime factor in the production of disease, with which he confused a humoral pathology different from that of Stahl, though equally absurd and erroneous.

1668–1738 A.D. *Bœrhaave*, the eminent Dutch physician and professor at the University of Leyden, and one of the most successful physicians that ever lived.

The most successful theorist of this trio was *Hermann Bœrhaave* (1668–1738 A.D.), the celebrated Dutch physician and contemporary of Stahl and Hoffmann, whose pathological doctrines were accepted all over Europe until refuted by Cullen, whose duty, *ex-officio*, was "to review and examine the different systems of physic" recognised in his time. Having been a man of great erudition, Bœrhaave for a long time enjoyed a world-wide reputation, which has been the lot of few physicians either in ancient or modern times.

Though differing from Hoffmann's system, he adopted a humoral pathology in combination with his chemical doctrines, and latterly "did not reject the consideration of a nervous fluid," though he considered it of minor importance in the production of disease.

He laid great stress upon the acrimony of the fluids under diseased conditions, and

fancying that this could be influenced by chemical means, his treatment was often at least useless, if not injurious.

He adopted the Galenic doctrine of humours, which he assimilated to his chemical doctrines, "and gave them a specific character founded on their chemical relations." His reputation had attained the highest pitch in Great Britain, while the appellation of the modern Galen was universally accorded to him.

To give an estimate of the fame of this truly illustrious physician, it is said that patients from all parts of Europe consulted him. "Peter the Great of Russia visited him; and a Chinese mandarin sent him a letter, addressed 'Herr Bœrhaave, celebrated physician, Europe;' and to crown all, when he died, in September 1738, it was found that he left a fortune of two millions of florins, derived solely from his profession." When appointed professor of medicine in the University of Leyden in 1701, after having abandoned theology, for which study he was originally intended, he recommended in his inaugural address the study of the ancient system of Hippocrates, but in 1703 his views had become considerably enlarged. The principal works upon which his fame rests

are: "Institutiones medicæ in usus annuæ, Exercitationis Domesticus," Leyden, 1708; and his "Aphorismi de cognoscendis et curandis morbis, in usum Doctrinœ Medicinæ," Leyden, 1709, both of which had been translated into several European languages, as also into Arabic.[1]

1740 A.D. *Van Swieten*, an eminent professor at Leyden, who adopted the doctrines of Bœrhaave.

The most celebrated of his pupils was *Van Swieten, of Leyden*, who subsequently became a professor at Vienna, and published "a vast collection of observations" in his great work, entitled "Commentaries on the Aphorisms of Bœrhaave," of whom he was an ardent admirer and warm supporter.

Kaauw Bœrhaave, a nephew, who practised with great distinction at St Petersburg, also contributed to disseminating these doctrines, including the influence of the nervous system in disease, in his work, entitled "Impetum faciens Hippocrati dictum."

Kaauw Bœrhaave, a nephew, who also embraced Bœrhaave's doctrines.

Notwithstanding the erudition displayed by these learned men, the state of therapeutics must have been at the very lowest ebb, for it was still the custom to recommend portions of human or horse flesh in epilepsy, and cases were actually exhibited in the

[1] See Burton's Account of "The Life and Writings of Bœrhaave," 2 vols., Lond., 1743; and Johnson's "Life of Bœrhaave," Lond., 1834.

poorhouse at Haarlem by this learned leech as having been successfully treated by these means!

1708–1777 A.D. *Haller*, the father of physiology, and one of the most distinguished authors of the Eighteenth Century.

Albrecht von Haller, truly styled the father of modern physiology, was born at Bern, in October 1708, and died in that city in 1777. This most eminent author and physiologist of the eighteenth century was a pupil of Bœrhaave, and a most prolific writer on physiological subjects, as well as a brilliant experimentalist. His numerous physiological discoveries raised the fame of the University of Göttingen, and his name shall ever remain intimately connected with the theory of muscular irritability and sensibility, deduced from patient observation and experiment, and by which he sought to explain the various phenomena of the body.

The gigantic efforts of this illustrious physiologist may be gleaned from the fact that in early life he was extremely feeble and delicate, and the subject of rickets. Shortly after graduating at Leyden, in 1727, he accepted the professorship of medicine, anatomy, botany, and surgery at the University of Göttingen, and during the period he held the professorship, between 1736 and 1753, he is said to have composed and published eighty-six works on medical subjects,

chiefly medicine and botany, and that, altogether, he contributed upwards of 12,000 notices or reviews of books. His most celebrated works were his "Elimenta physiologiæ corporis humani," 8 vols., Lausanne, 1757–1766; and his four Bibliothecæ or critical catalogues of works on botany, medicine, surgery, and anatomy.

His physiological views met with the severest criticism and opposition, the most notable opponents of which were Whytt; Porterfield, of Edinburgh; Sauvages, of France; and Bianchi and Fontana, of Italy. Fabre, of Paris, however, had the courage to apply his doctrine of irritability to pathology, and with considerable success; and even Cullen must have been imbued with his doctrines, for he attributed rheumatism to spasm of the muscular fibres.

Haller's genius was not entirely lavished upon his profession. He was also a great poet, and is still considered as such by the Germans.

About this period the fame of the Edinburgh school was rapidly rising, and perhaps this is the most fitting place to introduce a sketch of the illustrious men who contributed to the elevation of that famous seat of learning.

1697–1767 A.D. *Monro Primus*, a celebrated anatomist, and founder of the Edinburgh School of Medicine.

Alexander Monro, the celebrated anatomist, and founder of the Edinburgh School of Medicine, styled primus in order to distinguish him from his son and grandson of the same name, was born in London, 8th September 1697. Having studied in London under Cheselden, at Paris under Bouquet, and at Leyden under Bœrhaave, he passed the College of Surgeons, Edinburgh, in 1719, and in the following year was appointed the first professor of anatomy in the University,[1] where he graduated in 1756, and resigned the anatomical chair in 1759 in favour of his youngest son, though he still continued his clinical lectures at the Infirmary.

Of his labours as an anatomist and physiologist we have the following works:— "Osteology; or Treatise on the Anatomy of the Bones," Edin., 1724, 8vo; "Essay on Comparative Anatomy," Lond., 1744, 8vo; "Observations, Anatomical and Physiological," Edin., 1758, 8vo; and "An account

[1] See the able address of Sir Robert Christison delivered at the annual meeting of the British Medical Association, August 3, 1875, on the Rise and Progress of the Edinburgh School of Medical Learning. According to this authority, the University of Edinburgh was founded by James I. (of England) in 1582, and the first chair in medicine was instituted in 1685, "through the energy and influence of three of the most remarkable medical men of the day in Scotland, Sir Andrew Balfour, Sir Robert Sibbald, and Dr Pitcairn."

of the Success of Inoculation of Small-Pox in Scotland," Edin., 1765, 8vo; besides many other essays.[1]

Monro Secundus was if anything more famous than his distinguished father and predecessor; and it is no small item of credit to the family of the Monro's that their connection with the Edinburgh School extended over a century and a quarter.

1733–1817 A.D. *Monro Secundus*, the most distinguished of the Monro family as an anatomist.

Alexander Secundus was born at Edinburgh, 24th March 1733, and died 2nd October 1817, in his eighty-seventh year. Having received his early education in his native city he graduated at the University in 1755, and was appointed joint professor of anatomy and surgery with his father in the following year; and on the resignation of the latter in 1759, he became full professor of anatomy. On the completion of his studies, he visited the continent, and attended the anatomical lectures of Professor Meckel at the University of Berlin. He also visited Leyden, and became a Fellow of the College of Physicians in 1759. When at Berlin he published a short treatise entitled "De Venis Lymphaticis Valvulosis," "in support of the theory that the valvular lymphatics over the whole of the animal

[1] Chambers's "Encyclopædia."

body are one general system of absorbents," which entangled him in a controversy with the famous Dr William Hunter of London. His other contributions to medical literature are "On the Structure and Functions of the Nervous System," an illustrated folio vol., Edin., 1783; "On the Structure and Physiology of Fishes"; also an illustrated folio vol., Edin., 1785; "Description of all the Bursæ Mucosæ of the Human Body," Edin., 1788; and "Three Treatises on the Brain, the Eye, and the Ear," illustrated by plates, Edin., 1797, 4to; besides many other contributions.

1773–1859 A.D. *Monro Tertius*, the last of the Monros.

Monro Tertius, son of the preceding, was born at Edinburgh in 1773, and after having studied anatomy, medicine, and surgery in London, graduated at Edinburgh in 1799. He succeeded his father in the anatomical chair in 1808, which he conducted with considerable distinction for many years. Though not so famous as his immediate predecessors, he continued to maintain the reputation of his Alma Mater. He retired from the chair in 1847, and died 10th March 1859. His principal works are "Observations on Crural Hernia, with plates, Edin., 1803;" "The Morbid Anatomy of the Gullet, Stomach, and Intestines, Edin., 1811;" "Outlines of the Anatomy of the Human

Body, 4 vols., 8vo, Edin., 1813;" and several other works of minor importance.

This slight deviation from my chronological order has been undertaken with a view to prevent confusion, and to serve at once as an answer to the question, how many Monros were there? The same order shall be observed with regard to the distinguished family of the Gregories.

1710–1790 A.D. *Cullen*, one of the most eminent Scotch physicians of the last century, and originator of the doctrine of spasm and debility, and the first to introduce cream of tartar and antimonial powder into practice in this country.

William Cullen, one of the most celebrated professors of the Universities of Edinburgh and Glasgow, was born at Hamilton, in Lanarkshire, on the 15th of April 1710. His early medical career commenced in Glasgow by an apprenticeship, and attending classes at the University, after which he was appointed surgeon to a merchant ship, trading to the West Indies. He subsequently spent two winter sessions studying in Edinburgh, and was one of the founders of the Royal Medical Society of that city. In 1736, he settled in practice at Hamilton, where he first became acquainted with William Hunter, the celebrated anatomist and obstetric physician, and brother of the still more famous John Hunter, and having secured the friendship and patronage of the Duke of Hamilton, his career was one of uncheckered success. Stimulated no doubt by his success, and a

restless ambition, he graduated at the University of Glasgow in 1740, and having entered into partnership with a surgeon, he resolved to confine himself entirely to the career of a pure physician. Having acted in various capacities in the city of the west, he repaired to Edinburgh in 1755, through the influence of Lord Kames, as joint-professor of chemistry with Dr Plummer, who was in delicate health, and who died shortly afterwards. At this school he acquired the greatest distinction as an able and popular physician, having filled the chairs successively of the Institutes of Medicine, and the Practice of Physic. The speculative doctrines of Cullen differed from those of Stahl and Hoffmann (the theories of the latter approaching nearer to the truth in his estimation), and instituted a doctrine of spasm and debility "from which he deduced all the phenomena of febrile disorders." Rheumatism, as already mentioned, he attributed to spasm of the muscular fibres arising from an afflux of blood, and gout to a state of atony of the digestive organs, and in his explanation of the materies morbi of scrofula he had recourse to the hypothesis of an acrimony of the fluids.

He laid great stress upon the *vis medicatrix naturæ*, and had an idea of a peculiar faculty

of the brain or nervous fluid which acted independently of the muscular system and mind, and to which he applied the term irritability of the sensorium.[1]

The circulation, he held, could not be explained by mechanical laws; but on viscidity, and acrimony, either acid or alkaline, he considered to have an influence in producing disease, as well as by the action or torpor of the extreme arteries.

Cullen was by no means, as alleged by some, a purely speculative physician. On the contrary, he himself says: "I know there are no universal rules in the practice of physic; but there are general rules, which all admit of, with more or fewer exceptions, in theory and practice;" and again, "all our knowledge of nature consists in experience." To him we are indebted for the introduction into general practice in this country of remedies such as cream of tartar, tartar emetic, hyoscyamus, and the pulvis antimonialis, or James' powder.[2]

[1] These views are contained in his First Lines of the Practice of Physic, an able exposition of the history of disease.

[2] The principal works of this distinguished physician are —"First Lines of the Practice of Physic," Edin. 1777; "Synopsis Nosologiæ Methodicæ," 1785; and a "Treatise of the Materia Medica," 1789; all remarkable for their clearness of description, profound sagacity, and sound common sense.

Intimately connected with the fame of the Edinburgh School at this period we find the name of *John Gregory*. Indeed, the names of Cullen and Gregory are so familiar that one can scarcely think of the one without associating with it the name of the other. Both were essential to, and no doubt instrumental in raising and maintaining the reputation of the University of Edinburgh, and placing it among the foremost seats of medical learning. This illustrious Scotch philosopher and physician was born at Aberdeen, in 1724, in which place he received his early education. He was the son of Dr James Gregory (primus), professor of medicine in King's College, Aberdeen, and founder of the school of medicine in that city, and grandson of the eminent James Gregory, inventor of the reflecting telescope which bears his name. After a distinguished career as professor of philosophy and medicine at the University of Aberdeen, he was appointed professor of the practice of medicine in the University of Edinburgh, in 1766.

1724–1772 A.D. *John Gregory*, an eminent professor of the practice of physic in the University of Edinburgh, whose name is intimately connected with the rise and progress of that school.

As with the Monros, so it was with the Gregories, they were a distinguished family, which reputation they maintained for several generations. As an accomplished scholar and great physician, John Gregory acquired

the highest possible distinction, and was considered one of the foremost men of his time, and perhaps one of the best teachers which the Edinburgh School has produced. His principal works comprise the following: "Elements of the Practice of Physic," 1772; "A Comparative View of the State and Faculties of Man with those of the Animal World," 1765; and "A Father's Legacy to his Daughters," published after his death, in 1793.

His brother James succeeded his father in the professorship at Aberdeen, and though a man of considerable ability, does not appear to have left such a name behind him as some of the other members of this distinguished family.

John's son, James, was Gregory the third, who also inherited the talents of the family, and became distinguished as professor of the Practice of Physic in the University of Edinburgh, and author of various philosophical and literary essays. And the son of this James was William Gregory, the late eminent Professor of Chemistry at Edinburgh, who died in 1858.

According to Chambers's "Biographical Dictionary," page 289, it is said that "no less than sixteen members of this family have

held British professorships." A significant fact of the transmission of hereditary genius scarcely without a parallel.

The theories of Boerhaave had no sooner been supplanted on the continent than those of *Dr John Brown* made their appearance in this country. The Brunonian system of medicine, as it has been styled, found ready advocates and many warm supporters, as soon as it was promulgated, and, no doubt, any other absurd theory would have met with an equal support at the time. This remarkable man, and founder of the doctrine under consideration, was a Scotchman by birth, having been born in the parish of Bunkle in Berwickshire in 1735, the son of a day labourer, and, after having studied at the University of Edinburgh, officiated in the capacity of tutor to the children of the celebrated Dr Cullen, but, considering himself slighted by Cullen, he undertook an independent course of lectures, in which, in opposition to his patron, he advocated his new doctrine. All diseases were divided by him into sthenic and asthenic, dependent upon either an excess or deficiency of excitement in the system, the former to be removed by debilitating medicine, such as opium, the latter by stimulants, such as wine and brandy.

1735–1788 A.D. *John Brown*, founder of the Brunonian system of physic.

He considered man more in the light of a machine than as an organised being, and life he considered to be a forced state upon which everything acted in a stimulating manner; some too violently, others not sufficiently, thus accounting for both direct and indirect debility. Having divided all diseases according to this theory into sthenic and asthenic, he compiled a nosological arrangement absurd in the extreme, and a system of practice not without danger in its results.

By this system all the practitioner had to do was to refer diseases either to the sthenic or asthenic type, the remedies for which were —bleeding, low diet, and purging for the former, and free stimulation for the latter, which in a great measure did away with the necessity of labour and study.

It is doubtful if the temporary success of his system did him much good, for it appears that, though he was an author of some repute, he became involved in pecuniary difficulties, and having removed to London, died there, in extreme poverty, in 1788. His principal works are his "Elementa Medicinæ," and his "Observations on the Old System of Physic."[1]

[1] His son, Dr William Cullen Brown, published an edition of his works, with a Memoir, in 1804, 3 vols. 8vo.

Among the numerous theories which had been promulgated prior to, and about this period, the early part of the eighteenth century, must be mentioned the theory of association originated by *Erasmus Darwin*, "an English physician, natural philosopher, and didactic poet," and grandfather of the present illustrious naturalist, Charles Darwin. This fertile genius was born at Elton, near Newark, in 1731, and died in 1802. Having conceived the idea of applying the doctrine of association "to the theory and treatment of disease," he readily exposed the weaknesses of previous theorists by demonstrating that they regarded the living system as a simple whole, without due regard to the actions of different organs upon each other. He further observed that it is by the same organic laws by which the body is preserved and developed, disease is generated, and finally removed; and, applying this, supported by his own observations and experiments, he elaborated "a system of pathology and therapeutics, founded on the general laws of animated nature." He fell, however, into many gross errors, and though, for a time, he held a great reputation as a physiologist, his system turned out to be utterly untenable. He rejected the explanations which previous observers had

1731–1802 A.D. *E. Darwin*, founder of the theory of association in the production and treatment of disease.

given of febrile diseases, on chemical and mechanical grounds, and attributed the symptoms of fever to irregular actions of the nervous, vascular, and absorbent systems. His principal works are his "Botanic Garden in Verse," Lond., 1781; his "Zoonomia; or the Laws of Organic Life," 1793, and his "Phytologiæ; or, Philosophy of Agriculture and Gardening," 1800.

Anatomy and Physiology were now engaging the attention of numerous earnest workers in different parts of Europe, and the brilliant discoveries which were made during the remainder of this century far surpass in importance anything that had hitherto been attained.

In the early part of the century many physiologists were engaged in investigating the peculiarities of the fœtal circulation and the structure of the fœtal heart. *Duverney*, *Winslow*, *Thebesius*, *Ferrein*, and *Sénac*, especially made numerous experiments on the valvular and muscular structure of the heart, and *Lancisci* not only defined the nervous distribution of the heart, but also adduced theoretical views relating to the coronary arteries and the movements of that organ which proved inadequate to cope with the ideas of Haller on the same subject.

The minute structure of the lungs also came in for a good share of attention. *Morgagni*, 1762, *Michelotti*, *Helvetius*, and many others, directed their attention to this subject, and made numerous observations upon the change which the blood undergoes in its transit through these organs.

Duverney pointed out the similarity which existed between the chyliferous and lymphatic vessels, *Pacchioni* discovered the lymphatic glands of the dura mater, and drew attention to the influence of the dura mater upon the movements of the body, comparing it in its structure to that of the heart, and *Cowper* discovered the two glands behind bulb of the urethra which still bear his name.

The views of Pacchioni were defended by Lancisci, who attributed to the pineal gland the function of controlling the soul,[1] "the power of thought being in direct relation to the bulk of this little organ," and *Tarin Le Cat* and *Meckel*, made special investigations into the anatomy of the cranial nerves. The name of the latter is familiar to the anatomist in connection with the spheno-palatine gan-

[1] The pineal gland is a small reddish body about the size of a cherry stone, situated beneath the back part of the corpus callosum, and resting upon the anterior elevations of the corpora quadrigemina.

glion, or ganlion of Meckel, in the spheno-maxillary fossa, close to the spheno-palatine foramen.

The anatomy of the eye also came in for a fair share of attention about this period, with which we find the names of Morgagni, Petit, Albinus, Haller, Porterfield of Edinburgh, and Zinn of Göttingen, intimately associated.

The minute anatomy of the ear was described by *Valsalva*, to whose investigations we are indebted for much information respecting the labyrinth, though the discovery of the use of the fluid of the same was reserved for Cotunnius and Meckel.

The most illustrious names about this period will be found in connection with the physiology of generation. *Naboth of Leipsic* made numerous valuable observations on the mucous glands of the neck of the uterus, Morgagni and Santorini in regard to the ovaries, the Monros (Alexander, father, and son) into the development of the fœtus and the seminal ducts, and the celebrated William Hunter of London, with Haller and Monro, were "the first to inject portions of the delicate structure of these organs."

One of the earliest and best microscopic anatomists of the eighteenth century was *Lieberkuhn* of Berlin, whose name is so

familiar in connection with the Lieberkuhnian crypts or follicles of the small intestines, and whose skill in injecting various anatomical portions of the body secured for him a well earned reputation. It is said that he was the inventor of the solar microscope by which he was enabled to display the circulation of the blood. He also used chemical reagents for the first time, and thus paved the way for future discoveries.

Not the least important during this century were the researches which were conducted by numerous physiologists on the lymphatic system, amongst whom may be mentioned Cruikshank, Hewson, the Hunters, and Paul Mascagni, who, in 1787, in his "vasorum lymphaticorum corporis humani historia et iconographia," gave the first "general description of the entire lymphatic apparatus."

About the same time pathological anatomy was zealously studied by numerous excellent observers in every country in Europe, receiving the attention which so important a subject demands, and greatly enhanced by the labours of Morgagni, whose work on pathological anatomy evinces the culture of a highly philosophical and erudite mind.

The opportunities afforded by European

wars, during the period under consideration, gave ample scope to surgeons for studying the phenomena and treatment of wounds. *Lawrence Heister*, 1683–1758, the eminent German surgeon, whose name has already been mentioned, published a valuable system of surgery, and *William Chesselden* of London, 1720, made many important observations upon, and improvements in, capital operations, and, about the same period, the association of barbers and surgeons at Paris was abolished by an edict in 1743, which was speedily followed by a similar action in 1745 on the part of the English Parliament, thus severing for ever the link which had hitherto existed between ignorant imposters and the educated members of a learned profession.

Two names worthy of mention at this epoch are those of *Petit*, 1720, and *Desault*, 1774–1795, the eminent French surgeons, whose talents and industry have scarcely been surpassed in modern times. The former is justly regarded as the father of the pathology of diseases of the bones, and the latter remarkable for his improvements on the apparatus for fractures (a splint invented by him for fractures of the thigh being still in use) and amputating knives. Petit left a

work on general surgery of great value, and his treatise on diseases of the bones remained for many years the best work on that subject. He was the first to invent the screw tourniquet, and to operate for "fistula lachrymalis by transfixion of the sac." His extra-peritoneal operation for hernia has also, after being received, been "adopted by the profession." Desault, on the other hand, was the first who attempted the cure of artificial anus, resulting from strangulated hernia, and made some improvements upon the ligature of arteries. He also proposed the cure of aneurism by ligaturing the vessel on the distal side of the tumour, the efficacy of which is still doubtful, and contributed extensively to the improvement and advancement of his profession.

Among the other French surgeons of the same century, though of less note, may be mentioned *Le Dran*, most of whose works were translated into English; *Sabatier*, the famous operator; *Garengeot; Louis; Frère St Cosme*, the eminent monk and lithotomist, who invented the *lithotome caché*, and who acquired great celebrity as a lithotomist. Having considered himself specially commissioned by Heaven to cut for the stone, fistula, and rupture, he led a life of the

greatest piety and self-denial, accepting only sufficient money to obtain the bare necessaries of life, and to keep his cutting instruments in repair. His principal improvement in the operation of lithotomy was in substituting a cutting for a tearing operation. *Portal*, *Pouteau Lecat*, *Chopart*, originator of an operation through the tarsus, bearing his name; *Morand*, *Moreau*, etc.

1762 A.D. *Dr Shippen*, founder of the medical school of Pennsylvania.

In 1762, Dr Shippen, an American surgeon of some note, delivered anatomical and surgical lectures in Philadelphia, and laid the foundation of a medical school (now the University of Pennsylvania) which was completely established on the return of Dr John Morgan from Europe, and enhanced by the eminent services of Dr Benjamin Rush, "the Hippocrates of Columbia." In 1768, a medical school was established at New York; and in 1782, Harvard College, Cambridge, Massachusetts, was instituted; and in 1797, the medical school of Dartmouth, at Hanover, New Hampshire. Previous to these dates, Dunglisson, in his excellent history of medicine, says that "the earliest example of medical teaching in this country is probably found in the anatomical demonstrations of *Dr Thomas Cadwalader*, at Philadelphia, after his return from London, where he had studied

under the celebrated Cheselden." In 1750, a body was dissected in the city of New York by *Drs Bard* and *Middleton;* and so early as 1754, the famous William Hunter of Scotland,[1] delivered a course of lectures on anatomy and surgery at Newport, Rhode Island.

But to return to our own country, *Percival Pott*, one of the best authors and operators of his time, flourished about the middle of the eighteenth century. Not less famous than Petit or Desault, as a practical surgeon, he greatly improved the state of surgery in Great Britain. His principal forte lay in the treatment of fractures (himself having experienced a compound fracture of the leg) on which subject he has left an excellent treatise. He also wrote on various other surgical subjects, but the one with which his name is most familiar is "Pott's disease" of the vertebræ; he having been the first to distinguish between "curvatures of the spine, depending upon mere change of form in the bones, and those occasioned by caries and abscess." He also simplified the whole art of surgery, and was one of the first who limited the use of the actual cautery and escharotic unguents in the treatment of surgical diseases.

1760 A.D. *Percival Pott*, one of the best authors and operators of the Eighteenth Century, and the first who gave a clear description of diseases of the vertebræ.

A name familiar (though not so famous as

[1] London.

that of his younger brother John), as an accomplished anatomist and obstetric physician, about this period, we find that of *William Hunter*, of whose talents and industry, all that need be said here is that, by many,[1] he has been considered second to none, not even excepting, in his own capacity, that of his immortal brother, John Hunter. This celebrated Scotch physician was born at Long Calderwood, in Lanark, on the 23d of May 1718. At the age of fourteen he entered Glasgow College and studied there for five years, with a view to entering the clerical profession, but the bent of his mind was evidently not towards theology, for he abandoned the church and adopted the medical profession for his future career. In the winter session of 1740–1741, he studied at Edinburgh, and in the summer of the latter year, he repaired to London, when only twenty-three years of age, where, after residing for some time with Dr Smellie, he entered the family of Dr James Douglas, also a Scotchman, and well-known anatomist and obstetric physician, in the capacity of assistant in conducting dissections, and super-

1718–1783 A.D. *William Hunter*, one of the greatest anatomical teachers and obstetric physicians that ever lived.

[1] See an able paper on the life of William Hunter by Dr Matthews Duncan, in the "Edinburgh Medical Journal" for June 1876.

intendent of his son's education. Here his progress was so rapid and successful that he gave up the idea of returning to join his friend Cullen in partnership at Hamilton, but whose friendship he never afterwards lost.

About this time he was entered as a surgeon's pupil at St George's Hospital under Mr James Walker, and dissecting pupil under Dr Frank Nichols, who was then one of the most celebrated teachers of anatomy. Here he devoted his time principally to the study of anatomy, and after a brilliant career, receiving all the honours which different learned bodies could bestow upon him, he practised both surgery and midwifery with great distinction; and though he was "a polite scholar, an accomplished gentleman, a complete anatomist, and probably the most perfect demonstrator, as well as lecturer, the world had ever seen," yet his fame principally rests upon his achievements as an obstetric physician. In this department he was without a doubt one of the greatest that ever flourished in this or any other country. In 1762 he was consulted by Queen Charlotte, and two years afterwards was appointed physician extraordinary to Her Majesty. In 1767 he was elected a Fellow of the Royal Society, and in 1781 President of the Royal Aca-

demy of Arts. His great work on the Gravid Uterus appeared in 1774, having been commenced twenty-four years previously. Of his thirty-four large plates of the Gravid Uterus he himself remarked in a letter to Cullen, "will be a very considerable work for expense and show," and "perhaps the most considerable in that way that will ever be published."

His museum is said to have cost him about £100,000, and he bequeathed a sum of £8000 to maintain it; and his collection of coins cost him upwards of £20,000. Such magnanimity is not seen now-a-days, and it only shows what a tremendous reputation he must have had to have amassed such a fortune. His whole soul and life were devoted to the study of his profession, of which he was one of its brightest ornaments; and though he did not arrive at such a pinnacle of fame as the "uncouth lad," his brother John, he nevertheless merits the lasting gratitude of the profession. He was never married, and he died on the 30th of March 1783, at the age of sixty-five years.

1728–1793 A.D. *John Hunter*, the most cele-

National vanity, and especially Scotch pride, invariably becomes elated on the mention of the name of *John Hunter*, who, according to one account, may be considered

"the greatest physiologist, anatomist, and surgeon that the whole annals of medicine can furnish." And according to another, "the greatest man that ever graced the profession." This child of Nature was born at Long Calderwood, in the parish of Kilbride, in the county of Lanark (a small property belonging to his father, a descendant of the Hunters of Hunterston), in 1728, the youngest of ten children, his brother William being the seventh, and by whose fame John was stimulated to enter the medical profession. He commenced his medical studies at the University of Glasgow, about the year 1747, and as might be expected, his progress was so rapid that he became demonstrator of anatomy in his second session. He studied surgery under Cheselden, the celebrated lithotomist, during the summers of 1749 and 1750, and subsequently under Pott. Though by no means a brilliant operator he was a highly gifted surgeon, anatomist, physiologist, and general philosopher. His researches into physiology, pathology, human and comparative anatomy, far exceeded anything that had been accomplished by his predecessors, while his fertile mind enabled him to bring the knowledge so acquired to bear upon the practice of his profession.

brated anatomist and physiologist of modern times, or indeed of any period, and the originator of the proper treatment of aneurism.

He was the first to elucidate the doctrines of adhesion, granulation, and inflammation with its results; and to him we are indebted for improving and simplifying many operations. He was elected a fellow of the Royal Society in 1767, and in the following year was appointed surgeon to St George's Hospital, which enabled him to take pupils, each of whom paid him 500 guineas—the immortal Jenner having been one of his earliest. In 1783 he conceived the idea of building a museum, which was completed in 1785, and it was in December of the same year that he first performed his famous operation for the cure of popliteal aneurism, by ligaturing the artery at a distance from the tumour, and between it and the heart, which he subsequently extended to the treatment of all aneurisms. The importance of his labours can scarcely be over-estimated. He drew attention to the vitality of the blood, the proper treatment of gunshot wounds, advised excision of bitten or poisoned wounds, made valuable observations on the physiology and pathology of the teeth, and wrote a work, which still in many respects remains unsurpassed, on the venereal disease.

The amount of work which this truly great man was able to accomplish, and the im-

portance of his labours to his profession, may be gleaned from the fact that at the time of his death his museum contained upwards of 10,563 "specimens and preparations illustrative of human and comparative anatomy, physiology, pathology, and natural history."

He died in comparative poverty, on the 16th of October 1793, and was buried in the Church of St Martin's-in-the-Fields, from whence his remains were removed in 1860 to Westminster Abbey, where a suitable tablet has been erected to his memory.

Two years after his death his museum was purchased by Government for £15,000, and presented to the Royal College of Surgeons of England.

Besides his numerous contributions to science, he published a treatise (already mentioned) on the natural history of the human teeth 1771-1778; one on the venereal disease, 1786; observations on certain parts of the animal economy, 1786; and on the blood, inflammation, and gunshot wounds (published in 1794); a noble record of a life spent in the cause of science and of truth.[1]

[1] See the life of John Hunter, by Dreury Otley, prefixed to Palmer's edition of the works of John Hunter, 4 volumes, 1835.

1749–1823 A.D. *Jenner*, the discoverer of vaccination, and one of our greatest benefactors.

Side by side with these great names may be placed that of *Edward Jenner*, the discoverer of vaccination, in connection with which his name has been immortalised. This celebrated English physician was born at Berkeley, in Gloucester, on the 17th of May 1749, and was the third son of the Rev. Stephen Jenner, vicar of Berkeley, and rector of Rockhampton. He served his apprenticeship under Mr Ludlow, an eminent surgeon practising at Sudbury, near Bristol; and, after serving his time with that gentleman, he went to London, when twenty-one years of age, to prosecute his professional studies under the famous John Hunter, in whose family he lived for two years, having been one of his earliest pupils. Though he subsequently practised with considerable success in his native parish of Berkeley, the bent of his mind was not towards encouraging that "jog trot" style of existence, for in a few years afterwards, finding the fatigue of general practice irksome, he resolved to confine himself entirely to medicine, and graduated at the University of St Andrews for that purpose. Hunter's influence, sound teaching, and noble example, produced a lasting effect upon young Jenner; and it was under his guidance, and at his request, that

he undertook his investigations into, and published his memoir "On the Natural History of the Cuckoo," which appeared in the transactions of the Royal Society, in 1788.

Jenner's claim upon posterity, however, rests entirely upon his discovery of the prophylactic power of vaccination; and so far as we are concerned with him, it need only be mentioned how he came upon his discovery. Previous to his time, inoculation of the small-pox virus had been practised in all parts of the civilised world, and most learned men had been, during this century, endeavouring to discover some rational means by which this terrible pestilence might be mitigated. The lot of this happy discovery fell to Jenner, in 1798, and in the following manner:

While but a mere youth, and when studying his profession under his master at Sudbury, a young country woman came one day to seek medical advice, and on the subject of small-pox being mentioned in her presence she observed, "I cannot take that disease for I have had cow-pox."

This occurred about the year 1770, but it was not until 1775 that he had an opportunity, after his return to Gloucestershire, of examining into the truth of the statement of

the young woman who had had the cow-pox. He thereupon set to work, making observations and experiments upon the different varieties of cow-pox, which delayed the actual discovery until 1796, when, on the 14th of May of that year, he made his crowning experiment upon James Phipps,[1] which virtually settled the question. The success of this experiment was followed by many others, and the accumulation of facts thus ascertained enabled him to collect sufficient data for the publication of his first memoir on the subject, entitled "An Inquiry into the Causes and Effects of the Variolæ Vaccinæ." Though the evidence which he collected on the subject appeared conclusive, yet the practice met with the most violent opposition (and it is fortunate for humanity that the Keighly Guardians were not in existence at the time)! until about a year afterwards, "when upwards of seventy of the principal physicians and surgeons in London signed a declaration of their entire confidence in it" (vaccination). The tide was now too strong, and he soon had the pleasure of seeing his discovery pronounced throughout the civilised world. Honours were heaped upon him from all sides. Par-

[1] See Baron's life of Jenner.

liament voted him a grant of £10,000 in 1802, and a further sum of £20,000 in 1807. He died of apoplexy at Berkeley, in February 1823, full of years and honours, at the age of seventy-four.

Though it is not my intention to encroach much upon the present century there are a few more worthies of whom I must make brief mention in order to complete my historical sketch. Of these, *Antonio Scarpa*,[1] the celebrated anatomist, is one; and not only as an anatomist, but also as a physiologist, he acquired a world-wide reputation in connection with the innervation of the heart; having settled the question as to whether that organ was supplied with nerves or not. The fame of this great man and medical philosopher has been well earned. His works, which were numerous, and on a great variety of medical subjects, point him out at once as an extremely able observer, thinker, writer, and teacher.

1748-1832 A.D. *Scarpa*, one of the most distinguished anatomists of the Eighteenth Century, and discoverer of the nervous supply of the heart, etc., the first who drew attention to the position of the femoral artery at the upper part of the thigh in the triangle which bears his name.

His principal works are his "Treatises on the Organs of Smell and Hearing;" "On the Nerves of the Heart;" and "On the Minute

[1] Born at Castello-Motte, on the 13th of June 1747, and died at Pavia, 30th October 1832. He received his early education at Padua, and in 1783 filled the anatomical chair at Pavia.

Anatomy of Bone." His work on diseases of the eye, in 1801, was followed by his "Observations on the Cure of Aneurism," establishing the success of the operation propounded by John Hunter.

The "Io Triumph," however, of his labours culminated in his great work on "Hernia," published in 1809, a subject which he made specially his own. He also made some valuable observations on lithotomy; and it is sad to contemplate that the latter years of such a well spent life should have been clouded by the terrible affliction of almost total blindness.

In our own country several great names also appeared about this period. *John Abernethy*, one of the most celebrated English surgeons, and most popular teacher of his day, wrote on the "Constitutional Origin and Treatment of Local Diseases," 1806; "Lectures on the Thymus Gland;" and his "Lectures on the Theory and Practice of Surgery," were published in 1830.[1]

1764-1831 A.D. *Abernethy*, one of the most successful surgeons and teachers of his day.

Sir Astley Cooper, another eminent English surgeon, born at Brooke, in Norfolk, in August 1768, published a great work on

1768-1841 A.D. *Sir Astley Cooper*, the most successful practitioner of the Eighteenth Century, and author of a great work on hernia.

[1] Abernethy was the first who ligatured the carotid and external iliac arteries, two of the boldest surgical operations ever attempted.

"Hernia," with illustrations of life size; another on "Dislocations and Fractures," 1822; "A Treatise on the Anatomy of the Breast," 1829–1840; "Anatomy of the Thymus Gland," 1832; and died on the 12th of February 1841. After a most brilliant career, his professional income having exceeded that of any other living contemporary, and said to have reached the high figure of £20,000 per annum.

1769 A.D. *Anthony White*, the originator of excision of joints, first performed in 1821.

Britain also produced *Anthony White*, an able writer, and excellent practical surgeon, and originator of the excision of joints, as well as others of more or less note to be mentioned presently.

1771-1802 A.D. *Xavier Bichat*, one of the most promising physiologists of the Eighteenth Century.

Another name worthy of notice in this place is that of *Xavier Bichat*, one of the most illustrious anatomists and physiologists of his time, whose discoveries marked an epoch in biological science. Born at Thoirette, in the Department of Aix, France, on the 1st of November 1771. He studied at Paris under Desault, who adopted him as his son, and whose surgical works he subsequently edited.

In 1797 he commenced a course of lectures on anatomy and experimental physiology; and in 1800 was appointed physician to the Hôtel Dieu, Paris. A couple of years after-

wards, in July 1802, he fell a victim to overwork at the early age of thirty-one.

He was "the first to simplify anatomy and physiology by reducing the complex structure of the organs to the simple or elementary tissues that enter into them in common." His most important works are his "Anatomie Générale," published in Paris, in 1801; and "Recherches Physiologiques sur la vie et la mort," Paris, 1800; in which he distinguished between organic and animal life. The brief career of this promising physiologist forcibly reminds one of Byron's beautiful elegy on the death of Henry Kirk-White, one of the most touching pieces in the English, or indeed in any other language:

"Unhappy White! while life was in its spring,
And thy young muse just waved her joyous wing,
The spoiler came; and all thy promise fair,
Has sought the grave, to rest for ever there.
Oh! what a noble heart was here undone,
When Science' self destroy'd her favourite son!
Yes, she too much indulged thy fond pursuit,
She sow'd the seeds, but death has reap'd the fruit.
'Twas thine own genius gave the final blow,
And help'd to plant the wound that laid thee low:
So the struck eagle, stretch'd upon the plain,
No more through rolling clouds to soar again,
View'd his own feather on the fatal dart,
And wing'd the shaft that quiver'd in his heart;

Keen were his pangs, but keener far to feel,
He nursed the pinion which impell'd the steel;
While the same plumage that had warm'd his nest
Drank the last life-drop of his bleeding breast."

We have now to consider the practical application of the greatest discovery, so far as medicine is concerned, of any age, viz., the introduction of auscultation and percussion in the diagnosis of disease, with which the honourable name of *René T. H. Laennec* is connected. This distinguished French physician was born at Quimper, in Lower Brittany, in 1781.[1] He studied medicine in Paris, where he attended the practice of Corvisart, and after a short but brilliant career, he was appointed in 1816 as chief physician to the Hôpital Neckar, shortly after which he made his discovery. The original discovery is said to have been due to Avenbrugger, and some claim the same distinction for Hippocrates, but it is extremely probable that if Laennec had not

1781-1820 A.D. *Laennec*, the discoverer of percussion and auscultation in the diagnosis of chest diseases.

[1] A name not unworthy of mention here is that of Dr John Abercromby, the eminent Scotch physician, who was born at Aberdeen, on the 11th November 1781, and whose name is indelibly associated with diseases of the nervous system,—his great works on "The Intellectual Powers," and "The Moral Feelings," having stamped him as a man of high attainments and originality. His career was, moreover, marked by great piety and benevolence. He died at Edinburgh, on the 14th of November 1844.

appeared, the subject would have lapsed into obscurity, and, so far as we at the present day are concerned, we should probably have been still groping in the dark. It is almost impossible to overestimate the importance of this discovery, which, not only led to a better understanding of diseases of the chest, but also gave an unparalleled impetus to the diagnosis and morbid anatomy of diseases in general, without which there can be no rational system of medicine.

It was in 1819 that Laennec first published his "Traite de l'auscultation médiate," which has produced a greater effect for good than any other work which had ever appeared, especially in regard to the diagnosis of chest diseases. But he was not destined to witness the grand effects of his brilliant discovery, like the great seer who conducted the children of Israel into the Promised Land, he was not allowed to enter. Shortly after his treatise had appeared, symptoms of consumption were detected in his own chest, and after a few years' practice in Paris, in delicate health, he repaired to his native province, where he died, in 1826, at the early age of forty-five.

As I am now approaching the close of the eighteenth century, I have only to mention

one or two more names whose discoveries more properly belong to the present century. Yet, as I am not bound exactly by dates, and my heroes having been born within the limits of my historical sketch, a slight encroachment may be pardonable.

Though numerous able physiologists had appeared prior to the age at which we have now arrived, the physiology of the nervous system had not received the attention so important a subject deserved; and it was reserved for Sir Charles Bell, and Dr Marshall Hall, to add important discoveries to what was already known regarding the functions of innervation.

1788-1842 A.D. *Sir Charles Bell*, an eminent anatomist, physiologist, and surgeon, who wrote largely on the anatomy of the nervous system, etc.

Besides being an eminent surgeon and author of various works on surgery, *Sir Charles Bell* paid particular attention to diseases of the nervous system. A Scotchman by birth, having been born at Edinburgh in 1788, he received his early education in that city, and was admitted a member of the College of Surgeons of the same in 1797, after which he was appointed one of the surgeons to the Infirmary. In 1806 he went to London where he lectured with great success on anatomy and surgery at the Academy in Great Windmill Street. In 1812 he was admitted a member of the

Royal College of Surgeons of London, and was elected one of the surgeons of the Middlesex Hospital, which he raised to the highest pitch of excellence. In 1831, he was one of the five eminent men in science who were knighted on the accession of William IV., and in 1836 he was appointed professor of surgery in the University of Edinburgh. He was joint-editor with Lord Brougham of "Paley's Evidences of Natural Religion," and was one of the eight celebrated men selected to write the Bridgewater Treatises, his paper being on "The Hand; its Mechanism and Vital Endowments as Evincing Design," 1834. His principal contributions to medical science consisted of "The Anatomy of the Brain Explained in a Series of Engravings," 12 plates, Lond., 1802; "A Series of Engravings Explaining the Course of the Nerves," Lond., 1804; "Essays on the Anatomy of Expression in Painting;" "A System of Operative Surgery," 2 vols., Lond., 1807; "Anatomy and Physiology of the Human Body," 3 vols., 1816; "The Nervous System of the Human Body," 1830; and numerous other papers,[1] contributed to dif-

[1] He also devoted his attention to the subject of gunshot wounds, having twice relinquished his London engagements, in order to familiarise himself with the subject, first after the

ferent learned societies of which he was a member. He died suddenly in 1842.

The next worthy following in his footsteps was *Marshall Hall*, the eminent physiologist and discoverer of the reflex functions of the nervous system.

1790-1857 A.D. *Marshall Hall*, the discoverer of the reflex functions of the nervous system, and of the method of restoring suspended respiration named after him.

This famous English physician was born at Basford, in Nottinghamshire, in 1790, and graduated at the University of Edinburgh in 1812. After a tour to the leading Continental schools, he commenced practice in Nottingham in 1815, and soon acquired a wide reputation as a provincial practitioner. He removed to London in 1826, where he acquired the fame and distinction which has rendered his name historical. The success of his career in London was so great that, at the age of sixty, he was enabled to relinquish strictly professional labour, and to devote his time to more important subjects.

Of his earlier contributions to physiology may be mentioned his "Essay on the Circulation of the Blood," 1831, in which he described the "Caudal heart" connected with the vessels in the tail of the eel. On the "Inverse Ratio, which subsists between the Respiration and Irritability in the Animal

battle of Corunna, and again after the battle of Waterloo, when he visited Brussels for the same purpose.

Kingdom," published in the Philosophical Transactions for 1832, and his articles "Hybernation" and "Irritability" in Todd's Cyclopædia of Anatomy and Physiology.

His greatest achievement, however, was his discovery of the reflex functions of the nervous system, which occupied his attention during the last twenty years of his life. His "Memoir on the Reflex Function of the Medulla Oblongata and Medulla Spinalis," appeared in the Philosophical Transactions for 1833. His subsequent writings consisted chiefly of "Lectures on the Nervous System and its Diseases," 1836; "Memoirs on the Nervous System," 1837; "New Memoir on the Nervous System," 1843; and "Synopsis of the Diastaltic Nervous System," 1850. He also contributed numerous and valuable papers on strictly professional subjects, and one of his last bequests to science was his method of restoring suspended animation. Though his process is well known, it may here be briefly mentioned as a fitting conclusion to these remarks. The patient having been placed in the recumbent position, the head is placed on the left arm, the mouth opened, and the tongue drawn forward, then the body is to be rolled gently over towards the left side quite on the face,

and back again, making the body by its own weight compress the chest, which, on expansion by its elasticity, fills with air. This being repeated about fifteen times in the minute.

At the present day Silvester's method appears to be the most efficacious in cases of drowning, which consists of laying the patient upon his back and alternately raising the arms above the head and compressing them again against the walls of the chest, exciting at the same time some pressure on the lower part of the sternum; these alternate movements being repeated twelve or fourteen times in the minute. Of such an honourable career as that of Marshall Hall little need be said. He served his generation well, and his name has become historical. He died at Brighton, in 1857, at the age of sixty-seven.

Other names might be mentioned scarcely less worthy; but as I have already exceeded the limits of my essay, and as it would be almost impossible to do full justice to the host of able workers in the space and time at my disposal, I shall be content with the mere mention of such men as *Larrey* and *Dupuytren*, the eminent French surgeons; the latter, inventor of surgical instruments

and modes of operation in certain surgical cases, as well as an able investigator in pathological anatomy.

Robert Liston, the brilliant and skilful operator; *Martin Lister*, author of works on anatomy and natural history, etc.; *Schmacker* and *Richter*, of Germany; *Stephen Hales*, the celebrated statistician; *John Louis Badeloque*, the eminent French obstetrician; *John Freind*, author of commentaries on Hippocrates, and a history of physic from the time of Galen to the beginning of the sixteenth century; *Mason Good* and *Richard Mead*, two able English physicians; *Sir James Earle*, surgeon to George III., and an able writer on hydrocele, stone in the bladder, etc.; *John Huxam*, also an able English practitioner and voluminous writer on fevers and epidemic diseases; and many others.[1]

As regards the progress of therapeutics during the period under consideration, I fear much cannot be said. A glance at the early writers will show how absurd and useless were the means of cure adopted by our fore-

[1] When the medical history of the present century comes to be written, three subjects will stand prominently forward, viz., the discovery of the functions of the nervous system, the change of treatment in inflammatory diseases, and the use of anæsthetics in the relief of pain, and the general advance made in pathology, physiology, and therapeutics.

fathers in the treatment of internal diseases. Indeed, therapeutics proper made very little advance until within very recent times. We need not go further back than the sixteenth and seventeenth centuries for proof of this.

Dr John Macpherson, in an able summary of the state of medicine during the seventeenth and eighteenth centuries, deduced from the writings of lay and professional men, published in the "Edinburgh Medical Journal" for August and September 1876, gives a graphic description of the state of therapeutics at that time, from which the following extracts have been taken. Among the professional writers he includes *Clermont*, a native of Lorraine, who came over to England and practised in Wales for some years. *Drs Gideon Harvey, Maynwaring, Charleton, Carr, Baynard, Sir John Floyer, J. White, Cockburn, Strother, Sir Richard Blackmore, Willis, Morton*, and *Cheyne*, and among the non-professional writers the names of *Burton, Fuller, Boyle*, and *Sir W. Temple* are conspicuous. Professional jealousy was carried to such an extent in these days that the most vulgar language was made use of, which renders it necessary for us to receive their statements *cum grano salis*. Baynard writes: "A grave nod, and a graceful

grimace, with a charge of nose gunpowder, snuff 'twixt finger and thumb, or a spit after his pipe, are signs of disapproving of a new invention. One doctor cries up crabs and lobsters, as if health comes from the sea in armour; 'tother, oranges and lemons. Dr Alkaly says, vinegar and pepper is bad with roast beef; and Dr Acid, that pearl necklaces swell the glands of the throat, and will breed scurvy and king's evil. One asks his patients, Can you eat oysters? and 'tother, Can you drink verjuice? All these foolish extremes are of ill consequence. But where a physician gallops over his patients, and rides post to be rich, the sick man is lost through his precipitation. This, however, is no detriment to the doctor, for while one dies, other patients spring up. . . . Dr Wax, again, takes any impression, and always says as the dame and the nurse say, and 'becomes all things to all men that he may gain some money.'"

Sir W. Temple remarks—"The usual practice of physic among us runs still the same course, and turns in a manner wholly upon evacuation, either by bleeding, vomits, or some sort of purgatives; though it be not often agreed among physicians in what cases or in what degrees any of these are neces-

sary. . . . . The rest of our common practice consists in various compounds of innocent ingredients, which feed the hopes of the patient and the apothecary's gains, but leave nature to her course, who is the sovereign physician in most diseases, where they know no specific remedies, to prescribe diet."[1]

Another lay writer asserts that "the uncertainty of medicine has so distracted our physicians, that they vary even in the most common methods.

"At one time they keep their patients so close and warm as almost to stifle them with care, and all on a sudden the cold regimen is in vogue. In one age alkalies are in fashion, and in the next acids begin to recover their credit. Antimony at one time is next to poison, and again the most innocent thing in the world if duly prepared. Bleeding is practised in one nation, and condemned by their neighbours.

"Some people are prodigal of their blood, and others so sparing as if so much life and blood went together, and all of them with equal assurance that they are right." This is sufficiently ironical from a non-professional

[1] The dât system of treatment among the Burmese compares favourably with the above.

pen; but when we turn to what professional writers had to say on the subject, we find that they made matters still worse. Though the exactness of the science of chemistry was much talked of, it did not appear to influence the body of the profession. The discovery of Harvey did not appear to bear the fruit that was expected of it, one lecturer having remarked, "For Harvey, we explode both him and his circulation." Strother held that "general diseases must be cured by remedying their causes in order as they arose. The internal fixed causes are remedied by evacuation, under which head I reckon translation, and by alteration. Evacuations are emeties, cathartics, diaphoretics, diuretics. Translations are all the revulsions we make use of."

Clermont declared that purgatives were particularly applicable to the English, "for he knew no nation in Europe that, as a rule, bore bleeding so ill as the English, which he ascribed partly to their gross feeding, and partly to the heaviness of the air."

The different modes of practice in vogue during this period, have been ably illustrated by Dr Gideon Harvey, in his "satirical division of doctors," and though the picture has probably been overdrawn, his remarks

are both amusing and instructive. His classification embraced the following:

1. The farriers, "who found a panacea in iron and ordered it for all complaints, alike for the green sickness and for coughs."

2. Those who prescribed milk, especially asses' milk, in a great variety of diseases.

3. The bark doctors, who used the Jesuits' bark in all manner of complaints, as being a universal remedy.

4. The water doctors, who prescribed a course of mineral waters for all complaints.

5. Another class of water doctors who decided from the appearance of the urine the *fons et origo mali*, or those who, in the language of Burns, in his "Death and Doctor Hornbook" could discern—

> "Baith the disease, and what will mend it,
> At once he tells it."

6. *The bleeding doctors*, who bled indiscriminately in all complaints, many of whom thought they could not abstract too much blood. Dr White was in the habit of bleeding to the extent of five to six lbs. of blood in ordinary cases.

7. *The purging doctors.* "This treatment is one that has always been the English treatment *par excellence*, although

it has been relaxed of late, and patients do not now 'squirt their souls out' under it."

8. *The groping doctors.* This class pretended that they could not "discover a disease in a man without groping at his side, which knack is taught them by some physicians in Paris."

9. *Men-midwives,* who acted upon the credulity of their patients by telling them that their previous labours had not been properly managed.

10. *The expectation doctors,* who trusted to nature, and satisfied themselves by administering some useless or harmless ingredients which, if they did no good, could do no harm.

11. *The religious doctors,* who acted upon the minds of their patients, especially in fanatic times, when they had any trouble of conscience.

12. *Eccentric doctors,* who displayed eccentricity either in their manners, prescriptions, or both.

It is alleged of this class that "they might prescribe beer that had been made in winter, or four or five ounces of peach kernels in spring, or ordain a restorative electuary out of (things not to be had)

parrots' tongues and hawks' livers, as a most egregious physician of our town did."

Harvey complained very much of the number of useless drugs there were in the Pharmacopæia, and Blackmore remarks: "Many eminent physicians have recorded abundance of medicines in their writings, which, however, will disappoint the practitioner who relies upon them, as particularly those powerful medicines following: "the tooth of a boar, the jaw-bone of a pike, the bone of a stag's heart, the stone in a carp, the powder of goats' blood, the dung of labouring beasts and pigeons, the white excrement of a cock," &c., &c.

Besides these remedies, they practised violent blistering, sweating, purging, scarification, cauteries, setons, and issues. Some of the popular secret medicines ordered by physicians, were Sir Walter Raleigh's cordial, plague water, Russell's powder, Dr Stephen's powder, Dr Goddard's drops, goa-stone, mummy, and a great variety of such like remedies.

Dr White, in indicating the complexity of medicinal preparations, says, that "if we jumble together, blindfold, such a mess as the precious hard stones and pebble stones, pearls and wilks, chinaware and tobacco

stoppers, terra lemnia, and English earth, bricks and slates, Welsh coal and Scots coal, human excrement and goose dung (especially because the last four have sulphur, and there is some manifest salt in the last), we shall have a good alexipharmatic medicine."

Blackmore remarks that "the discovery of the bark of Peru has furnished us with an indication never till then dreamed of, which I may call a period, though I mean the remission of that period only. So that, not only the intermissions of agues and the remissions of putrids, but also periodical disorders, such as convulsions, dry asthma, and epilepsies, receive advantage by the administration of this drug."

Though the dysenteric root, ipecacuanha, was well known about this period, Dr Cockburn writing in 1736 remarks, that "the French who had been religious admirers of ipecacuanha for half a century, had now been for some years cured of their credulity." Dr White also appeared to have been disappointed with the effects of ipecacuanha. On the subject of bleeding, the latter authority also observes, 1712, that "it is evident that national dangerous errors may prevail among physicians, from what befell Germany and Holland, by Paracelsus

and Helmont, whose followers would not let blood in the distempers in which it was found to be of absolute use by the ancients, such as fevers, tremors, pleurisies, etc., and ever will be to the end of the world, unless mankind should get a new and different organisation of body; and so this leaven crept over into England also, and prevailed so far that it was thought almost equal to murder for a physician to order blood-letting in the small-pox and malignant fevers." The Italians did not bleed in those days, and it would have been well if this treatment had not been adopted in Count Cavour's case. Lord Byron's death was also no doubt hastened by phlebotomy. Various kinds of bathing, vapour baths, etc., were much in fashion at this time, as also change of air and climate, of which the most was made.

Strother observed that the thermometer (which is now in every practitioner's pocket) "was the only certain test of the degree of increase of temperature in fever, and mentioned cases of fever treated successfully by immersion in cold water," thus anticipating our more modern treatment so much advocated by many.

Boyle was also aware of the doctrine of

endosmosis, and applied it to the theory of the absorption of medicines.[1]

It must not be concluded from the foregoing sketch that our predecessors were either ignorant of the nature of diseases, or deficient in therapeutic resources. On the contrary, there were then, as now, great physicians who used the means at their command with no less skill than is done at the present day, and though we are in advance of them so far as to be able to treat many diseases successfully, which they could not hope to do owing to our art being an ever shifting and advancing one, yet their triumphs and their rewards were well earned.

To be a great physician does not depend upon the age in which a man lives, nor altogether upon the culture which he receives, or the means at his disposal for the relief of human suffering. It flows rather from a combination of attributes with which great judgment and powers of observation are intimately blended. He who does not believe in physic can never be a great physician, nor a brilliant practitioner, and it is often from a lack of these qualities that

[1] For further details see the "Edinburgh Medical Journal" for August and September 1876.

many fail in producing a mark upon their generation.

It is a frequent argument with sceptics that medicine cannot be called a science, because there is little or nothing known with certainty about it, that there are no specifics, and that, altogether, it is as shifting as a quicksand, and indefinite; but such weak philosophers lose sight of the fact that since man is bound to die, it does not matter whether we possess specifics or not, that all has been done for medicine, up to our time, which human intelligence has been capable of attaining, and that, lastly, the members of the medical profession are second to none in intelligence, education, general culture, and sound judgment.

As to the state of therapeutics at the present day, it must be admitted that we are extremely well equipped. We can battle with the most formidable diseases, and we can alleviate symptoms where we cannot hope to cure. Even this is a great deal. Any one who has experienced serious illness can readily appreciate the great comfort to be derived from many of the measures with which we are acquainted, even excluding the tremendous achievements we have attained in the treatment of surgical diseases.

In the light of specifics the following medicines appear to possess particular value, viz., Quinine in intermittent fevers, iodide of potassium in aneurism, ipecacuanha in dysentery, antimony in croup and inflammatory affections of the respiratory organs, bromide of potassium in epilepsy and convulsions, turpentine in hydatids of the lungs and hæmorrhage, hydrate of chloral in delirium tremens, cod liver oil and the hypophosphites in phthisis, gurgon oil in leprosy, the Calabar bean in tetanus, nitrite of amyl in angina pectoris and asthma, tincture of steel in diphtheria and erysipelas, carbolic acid and other antiseptics in the treatment of surgical diseases and operations, and if rumour is to be credited, the action of salicin in cutting short rheumatic fever, besides a great many other extremely valuable remedies in different states of the system, to say nothing of our achievements in prevention and diagnosis. With these powerful weapons we approach the bed of sickness with confidence, and though the arch enemy, death, cannot always be combated, we can at least smooth the way and receive the lasting gratitude of patients whom we accompany to the brink of that terrible chasm where

"Beyond these voices there is peace."

INDEX.

H. & J. Pillans, Printers, 12 Thistle Street, Edinburgh.