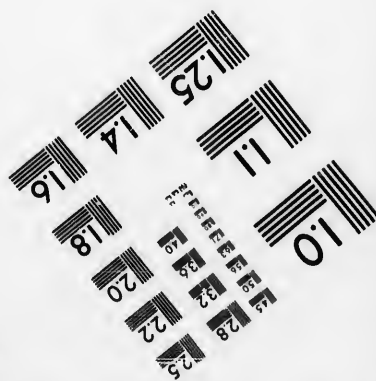
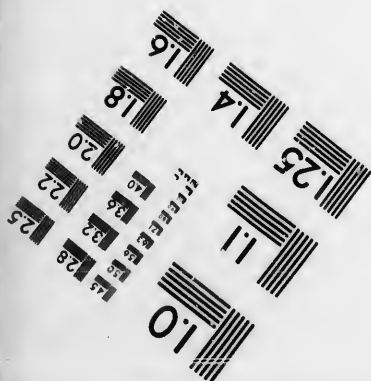
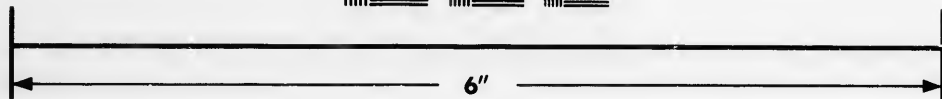
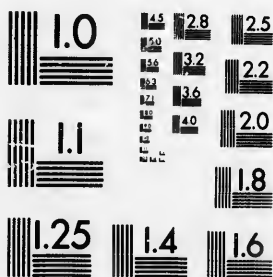


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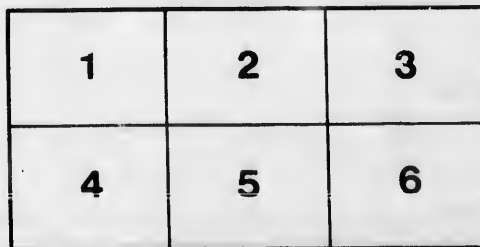
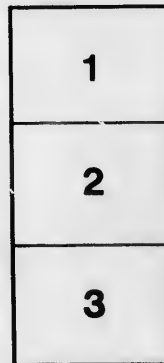
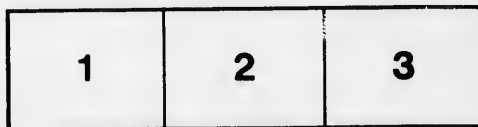
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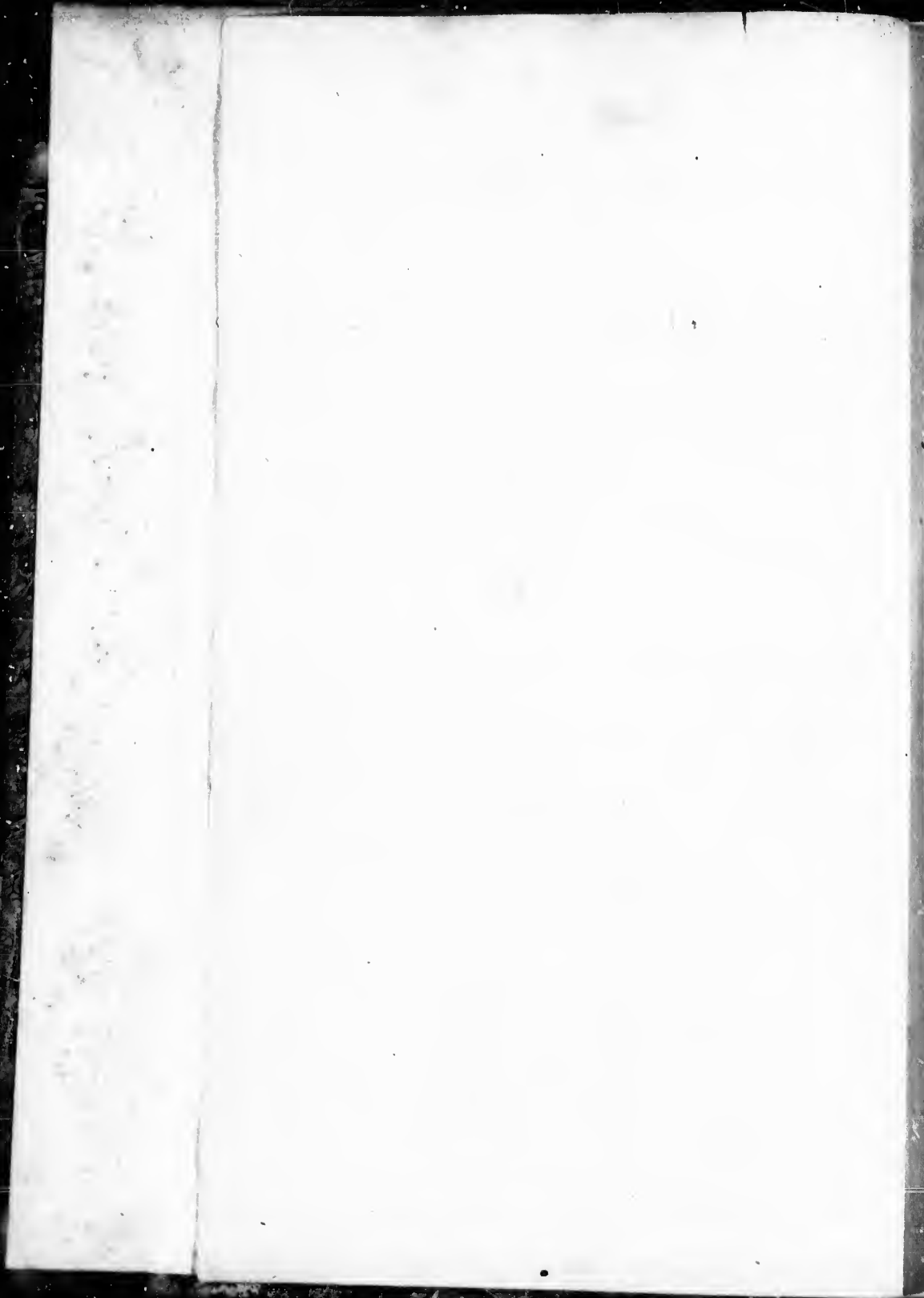
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32X



THE
AMERICAN ORACLE.

COMPREHENDING

AN ACCOUNT OF RECENT DISCOVERIES

IN THE ARTS AND SCIENCES,

WITH

A VARIETY OF RELIGIOUS, POLITICAL, PHYSICAL,
AND PHILOSOPHICAL SUBJECTS,

Necessary to be known in all FAMILIES, for the Promotion of
their present FELICITY and future HAPPINESS.

BY THE HONOURABLE
SAMUEL STEARNS, LL. D.

AND DOCTOR OF PHYSIC;
ASTRONOMER TO HIS MAJESTY'S PROVINCES OF QUEBEC,
AND NEW BRUNSWIC;
ALSO TO THE
COMMONWEALTH OF MASSACHUSETTS,
AND THE STATE OF VERMONT, IN AMERICA.

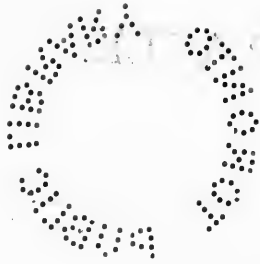
Quàm ampla sunt Opera tua, O Jehova! Quam ea omnia sapienter fecisti!

LONDON:

Printed for, and sold by, J. LACKINGTON, No. 46 and 47,
Chifwell-Street, Moorfields; and J. PARSONS, No. 21,
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P R E F A C E.

KIND READER,

THE miscellaneous Work contained in the subsequent Pages, and presented to the Public, is intended to inform and improve those who may think their time not unprofitably spent in its perusal, and who stand in need of information.

It was not the Author's design to have made those things public at so early a period; but to gratify a number of his private friends, who conceived his Productions in a light perhaps beyond their intrinsic value, and requested they might be immediately published for the benefit of Mankind, he is induced to abandon his original intention, and thus present them to the impartial Public.

A few

A few things in Prose are extracted from various Authors; but the Poetry, with the exception of a few lines, was composed by the Author himself. As the subjects are numerous, brevity has necessarily been attended to, and every endeavour used to comprehend *multum in parvo*, and preserve accuracy and correctness. But as errors may have escaped his observation, should any be discovered by the Readers, he will thankfully receive their communications of the same, and carefully endeavour to attend to their correction in a future edition.

Philosophy, and the Liberal Arts and Sciences which have been nurtured by its progress and improvements, and has shone out with such remarkable splendor in these modern ages, have been the objects of his early and unremitting study. The practice of Physics, and the making of Astronomical Calculations, engaged his attention for upwards of twenty years, and in the course of his travels in England, Scotland, Ireland, France, and many parts of America, he has attended Lectures upon Physiology, Chymistry, Magnetism, Electricity, Optics, Astronomy, and other Branches of Natural and Experimental
Philosophy,

Philosophy, has had a familiar acquaintance with the most approved Authors upon the Liberal and Mechanical Arts and Sciences, all of which have contributed to furnish him with the knowledge that is communicated to the Public through the medium of this Work, and enabled him to complete it in a manner that may render it productive of the good purpose for which it is intended; and although it is called *The American Oracle*, yet from the variety of subjects it comprehends, it will be found to be *The Oracle of the World*, because it contains a general account of the Universe.

As the Work is calculated to diffuse useful knowledge amongst mankind, to stimulate them to acts of goodness and virtue, and thereby promote their present felicity and future happiness, should it eventually prove conducive to those great and important objects, it will be an ample reward for the labour which has attended its prosecution, and afford lively sensations of joy and pleasure to the Reader's, and the Public's

Most obedient

humble servant,

THE AUTHOR.

London, June 15, 1781.

ERRATA.

- Page 3, line 25, for 411, read 511.
— 31, — 11, for Sept. read Oct. 19.
— 32, — 11, for Oct. 6, peace proclaimed in 1782, read
1783.
— 33, — 9, Read, Peace proclaimed between Great-Bri-
tain, Holland, and America.
— 60, — 31, for procession, read precession.
— 93, — for 39, read page 93.
— 176, — 10, for colume, read colum.
— 187, — 7, for twenty, read sixty.
— 269, — 24, for are inclined, read is
— 398, — 18, for inimentum, read linin...
— 486, — 1, for 6, read page 486.
— 602, — 1, for at, read as.
— — 15, rafe out, "clean animals that he had."
— 609, — 12, for a thing is, read a thing which is.
— 618, — 25, for 1789, read 1790.
-

DIRECTION TO THE BINDER.

Let the figure of the Solar System face the 90th page.

THE
AMERICAN ORACLE.

CHAPTER I.

*Of CHRONOLOGY—with Tables of remarkable Æras
and Events, from the Creation to the Year 1790.*

AS *astronomers* begin their computations at certain fixed points in the heavens, called æpochas, or radical places; so *historians* begin their reckonings from certain fixed points of time, called æras, or radices of time; as that of the Creation, Noah's Flood, &c. as in the subsequent Tables.

	Anno Mundi
The creation of the world	0
Noah's flood	1656
The birth of Abraham	1948
Sodom and Gomorrah destroyed	2107
The departure of the Israelites out of Egypt	2452
Their entrance into Canaan	2492
Saul, the first King of Israel, began to reign	2909
Solomon's temple began	2932
The destruction of Samaria	3226
An angel destroys 184,000 of the Assyrians	3294
Babylonish captivity	3349
B	Solomon's

	Anno Mundi
Solomon's temple destroyed	3360
The beginning of Daniel's 70 weeks	3492
Death of Alexander the Great	3626
Restoration of the Jews	3784
Correction of the Calendar by Julius Cæsar	3905
Herod began to reign in Judea	3949
	Anno Domini
The reputed æra of the birth of Christ	0
He disputes with the doctors in the temple	12
Is baptised by John in the Wilderness	27
And crucified by the Jews	33
Stephen is stoned to death	34
St. Paul is converted	36
St. Matthew writes his Gospel	39
The followers of Christ first called Christians	40
Claudius Cæsar's expedition into Britain	43
St. Mark writes his Gospel	44
London founded by the Romans	49
The council of the apostles at Jerufalem	52
St. Luke writes his Gospel	55
St. Paul sent in bonds to Rome, preacheth, and writes his epistles	62
The acts of the apottles written	63
The Christians persecuted at Rome	64
St. Peter and St. Paul put to death	67
Titus takes Jerufalem; 1,100,000 Jews perish; 97,000 taken prisoners	70
A plague kills 10,000 persons at Rome	78
The Philosophers expelled Rome by Domitian	83
St. John, the evangelist, wrote his Revelation	96
Writes his Gospel	97
The Jews murder 200,000 Greeks and Romans	115

Anno Mundi

3360
3492
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3784
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Anno Domini

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on 96
97
115
The

Anno Domini

The Jews all banished out of Judæa ;	580,000	
destroyed by the Romans	-	135
Justin writes his first Apology for the Christians		139
Ptolomicus Geographus lived	-	140
Galenicus Medicus lived	-	143
Arrianus Historicus lived	-	145
Antoninus Philofophus lived	-	161
Oppianus Poeta	-	217
Purgatory invented	-	250
Silk first brought from India to Europe		274
Constantine the Great began to reign		306
Cardinals first began	-	308
The Christian Religion tolerated by Constan-		
tine	-	313
The first general council at Nice	-	325
St. Martin lived	-	363
Bells invented by Bishop Paulinus, of Campag-		
nia	-	400
Rome taken by Aleric, king of the Vifi-Goths		410
The Romans evacuate Britain	-	426
Socrates, an historian, lived	-	435
Christianity introduced into Britain by the		
Romans	-	477
The Christian Religion introduced in France		496
The doctrine of purgatory introduced		511
Dionysius, a monk, introduces the computing		
of time by the Christian æra	-	516
The manufacturing of silk introduced in Eu-		
rope	-	552
A terrible plague continues near 50 years all		
over Europe, Asia, and Africa	-	557
Latin ceases to be spoke in Italy	-	580
Augustin, a monk (with 40 more) comes into		
England	-	596

	Anno Domini
The power of the popes begin	606
Mahomet dies, aged 64	634
Jerufalem is taken by the Saracens	637
Alexandria in Egypt taken by ditto, and the grand library burnt	640
Glaſs invented in England, by Benalt, a monk	664
The Saracens conquer Spain	713
The computing of years from the birth of Chriſt firſt uſed in hiſtory	748
A plague deſtroys 34,000 perſons in England	772
Charlemagne, K. of France, gave the preſent names to the winds and months	800
Alfred the Great divides England into coun- ties, compoſes a body of laws, erects county courts, and founds the univerſity at Oxford	896
The univerſity at Cambridge founded	915
A plague deſtroys 40,000 people in Scotland	954
The coronation oath firſt uſed in England, and juries firſt inſtituted	979
Figures in arithmetic brought into Europe from Arabia, letters having been uſed in their room	991
Paper, made of cotton rags, uſed	1000
The Turks take Jeruſalem from the Saracens	1065
Muſical notes invented	1070
Juſtices of the peace firſt appointed in Eng- land	1076
The tower of London built	1080
The order of Knight Templars inſtituted	1118
The canon law collected by Gratian, a monk of Bologna	1151
London bridge firſt built of ſtone	1160
	Paper

Anno Domini		Anno Domini
606	Paper first made of linen rags	1170
634	Glass windows began to be used in private	
637	houses in England	1180
640	Conjunction of the sun, moon, and all the	
664	planets, in Libra. Sept.	1186
713	<i>Dieu et Mon-droit</i> first used as a motto	1194
748	Chimnies first made, and surnames first used,	
772	in England	1200
800	Astronomy first studied by the Moors	1201
896	London first incorporated into a city, with	
915	a Mayor, &c.	1208
954	Magna Charta signed by King John; and	
979	the Court of Common Pleas established	1215
991	Astronomical tables constructed by Alonso,	
1000	King of Castile	1253
1065	Commons first summoned to Parliament in	
1070	England	1264
1076	Mariners' compass invented, or improved,	
1080	by Givias of Naples	1302
1118	Gold first coined in Christendom	1320
1151	The first comet whose course is described	
1160	with exactness	1337
Paper	The French lose 400 vessels, and 30,000	
	seamen, in a sea-fight with the English	1340
	Gun-powder and guns invented, oil-paint-	
	ing first used, and the Herald's College	
	instituted	1348
	Ninety-thousand people die of a plague in	
	Germany	1348
	Knights of the Garter instituted in Eng-	
	land; and a plague destroys near nine-	
	tenths of the people in Britain	1349

	Anno Domini
Coals first brought to London	1357
A shower of hail kills 1000 men, and 6000 horses, in England	1359
A dreadful plague in England	1361
57,374 people die of a plague in England	1362
Windfor Castle built	1386
A terrible plague and famine in England ; and cards invented in France for the King's amusement	1391
Westminster Abbey re-built	1399
Guild-hall, in London, built	1410
The university of St. Andrews, in Scotland, founded	1411
Pumps first invented	1425
Printing invented in Holland	1440
100,000 people destroyed by an inunda- tion in Holland	1446
The university at Glasgow, in Scotland, founded	1454
Engraving and etching on copper invented	1460
The university of Aberdeen, in Scotland, founded	1477
First standing army in England established	1483
Maps and sea-charts first brought into England	1489
The study of the Greek language introduced in England	1491
The Spanish inquisition ;— 15,000 Jews driven out of Spain	1492
America discovered by Columbus	1492
Algebra first known in Europe	1494
	South

Anno Domini		Anno Domini
1357	South America discovered by Americus Vesputius - -	1497
1359	North America discovered by Sebastian Cabot, about - -	1498
1362	Thirty thousand persons die of a plague in London - - -	1499
1386	Shillings first coined in England -	1505
	Columbus died, aged 59 -	1506
1391	Gardening introduced into England, from the Netherlands; and half of the people die of a plague in Britain	1509
1399	Martin Luther began the Reformation	1517
1410	The Pope gives the title of Defender of the Faith to the King of England	1520
1411	Cannon began to be used in ships -	1539
1425	Pins first used in England, in the room of skewers; and silk stockings first worn by the King of France -	1543
1440	Council of Trent begins -	1545
1446	First law in England establishing the interest of money - -	1546
1454	Books of astronomy and geography destroyed, as infected with magic, in England - -	1552
1460	The Reformation completed in Scotland by John Knox; and silk stockings first worn in England by Q. Elizabeth	1561
1477	Knives first made in England -	1563
1483	The Royal Exchange in London built	1569
1489	Thirty thousand necromancers in France; and a great massacre of the Protestants at Paris - -	1572

THE AMERICAN ORACLE.

	Anno Domini
The Dutch in Holland revolt from the Spanish government	1579
East India company incorporated	1579
Sir Francis Drake, the first English circumnavigator, returns from his voyage round the world	1580
New Style introduced in Italy by Pope Gregory	1582
Tobacco first brought from Virginia into England; and Newfoundland settled by the English	1583
Q. Elizabeth beheads Mary Q. of Scots, after 18 years imprisonment	1587
Coaches introduced into England	1589
A band of pensioners instituted in England	1590
Trinity College, in Dublin, founded	1591
Watches first brought into England from Germany	1597
Theory of the Tides first given by Keplar	1598
Decimal arithmetic invented at Burges	1602
England and Scotland unite under the name of Great Britain	1603
30,578 persons died of the plague in London	1604
Powder plot discovered at Westminster	1605
Oaths of allegiance first administered in England; and Canada settled by the French	1606
Virginia settled	1607
New York, the Jerseys, and Pennsylvania, settled by the Dutch and Swedes; and Galileo discovers four of the satellites of Saturn	1608
	Six

CHRONOLOGY.

9

Anno Domini

Anno Domini

	Six hundred wizards condemned, and most of them burnt, in France	-	1609
1579	Jupiter's moons first discovered by Galileo		1610
1579	Baronets first created in England; and 200,000 persons die of the plague in Constantinople	- -	1611
1580	Logarithms invented by Napier, a Scotchman; and Sir Hugh Middleton brings the New River to London, from Ware		1614
1582	Harvey confirms the circulation of the blood		1619
1583	The broad silk manufacture from raw silk, introduced into England; and negroes first imported into Virginia		1620
1587	Nova Scotia settled by the Scotch; and New Plymouth, in New England, settled by Puritans	- -	1621
1589	First neat cattle imported to America		1624
1590	The island of Barbadoes settled by the English; and 35,417 people die of the plague in London	- -	1625
1591	Massachusetts settled	- - -	1628
1597	New Hampshire settled	- - -	1629
1598	Boston built	- - -	1630
1602	Maryland settled	- -	1631
1603	Died of a plague at Lyons in France, 60,000 people; and Maryland given to Lord Baltimore	- -	1632
1604	Huygens discovers Saturn's ring; and Providence, in Rhode Island, built		1634
1605	Connecticut settled; and regular posts established from London to Scotland, Ireland, &c.	- - -	1635
1606			Rhode
1607			
1608			
Six			

	Anno Domini
Rhode Island settled	1638
Newport built	1639
Forty thousand English Protestants massacred by the Irish	1640
Sir Isaac Newton born	1643
Electricity, the first idea of it, given by Ottoguericke	1647
K. Charles I. beheaded, aged 49	1649
Cromwell assumes the protectorship	1654
Huygens discovers the fifth moon of Saturn; and Admiral Penn takes Jamaica from the Spaniards	1655
Cromwell dies	1658
K. Charles II. restored	1660
The Royal Society established at London	1662
Carolinas planted	1663
The Dutch and Swedish settlements in North America conquered by the English	1664
68,000 persons die of a plague in London	1665
Great fire in London; and tea first used in England	1666
Peace of Breda	1667
Peace of Aix-la-Chapelle	1668
Peace of Ninceguen; and Habeas Corpus act passed	1672
49,487 people die of a plague in Vienna	1679
A great comet appeared from Nov. 3, to March 9; and the true orbits of comets demonstrated by Doetsfel	1680
Philadeiphia founded	1682
	Bayonets

Anno Domini

1638
1639
1640
1643
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1660
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yonets

Anno Domini

Bayonets first used by the French—Bank
of England established—and, the first
public lottery drawn - - 1693
Stamp duties instituted in England 1694
Peace of Ryfwick - - - 1696
Darien, in America, settled by the Scotch
Prussia erected into a kingdom; and, Soci-
ety established for the propagation of
the gospel in foreign parts - 1701
Gibraltar taken from the Spaniards; and
Court of the Exchequer instituted in
England - - - 1704
Dr. Benj. Franklin born Feb.; and a treaty
of union between England and Scotland 1706
A new mountain rises out of the sea in Tur-
key, in Europe called *Thera*; and the
first British parliament - 1707
Minorca taken from the Spaniards; and
Sardinia erected into a kingdom 1708
St. Paul's church re-built by Sir Christoph.
Wren, in 37 years - - - 1710
The peace of Utrecht, whereby Newfound-
land, Nova Scotia, New Britain, and
Hudson's Bay, were yielded to Great
Britain, and Gibraltar and Minorca
were also confirmed to the British crown 1713
Aurora Borealis first seen - 1715
A rebellion in Scotland in favour of the
Pretender - - - 1715
An act passed for septennial parliaments 1716
Lombes, at Darby, erects a silk throwing
machine, containing 26,586 wheels, all
of

	Anno Domini
of which take up one-eighth of a mile, and are moved by one water wheel : In 24 hours it works 318,504,960 yards of Organzine filk thread -	1719
Died of a plague, at Marfeilles, 18,000 persons - -	1720
Inoculation first tried on criminals, with fuccefs ; and Sir Ifaac Newton dies, aged 84 nearly - -	1727
Georgia, in North America, fettled ; and Gen. Washington born Feb. 11.	1732
Died of a plague at Messina, in Sicily, 50,000 persons - -	1743
Commod. Anfon returns from his voyage round the world - -	1744
A rebellion in Scotland, projected by the French ; and 6000 Americans, with affiftance from England, take Cape Breton from the French -	1745
Electric fhock difcovered at Leyden, by Cuneus - - -	1746
The peace of Aix-la-Chapelle -	1748
Westminster bridge, after 12 years labour, finifhed : (it coft 389,000l.) -	1750
The Antiquarian Society at London incor- porated - -	1751
Sea water made fresh by experiment	1752
Old ftyle ceafes, Sep. 3. - -	1752
The Britifh Mufeum erected ; and a Society of Arts, Manufactures, and Commerce, inftituted in London - -	1753
	A. D. 1754.

Anno Domini

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A. D. 1754.

The British colonies in North America being almost surrounded by French, Spaniards, and Savages; and the French having augmented their armies, and made encroachments upon the British settlements, by erecting forts on the banks of the river Ohio, to which place Col. Washington, at the head of 4000 men, marches; builds a fort, which, on being demanded by a small party of French, they are taken prisoners. The Governor of Canada attacks the fort; and Washington, on being overpowered with numbers, capitulates, surrenders, and marches towards Virginia. Many of the English are plundered and murdered by the Indians. From hence a war broke out between England and France.

1755.

The English take from the French two ships, 600 soldiers, with their officers, and 5000 crowns, off the banks of Newfoundland.

Two thousand men from New England take Nova Scotia, and disarm 15,000 neutral French and Indians.

Gen. Braddock defeated by the French and Indians, near Fort du Quesne

Gen. Johnson defeats the French at Fort Edward, and takes their commander, Baron de Dieskau, prisoner

Gen. Johnson is created a Baronet, and the parliament gives him 5000*l.* for his good services.

Gerith, near Bombay, taken by the English.

A. D. 1756.

A. D. 1756.

The French land 18,000 troops on the island of Minorca. Admiral Byng's cowardice. Fort St. Philip, and Fort St. Oswego, taken by the French. Marine Society established in London. Parliament resolves to augment the land army from 35,000 to 49,740 effective men; and the seamen to 55,000, including 11,419 marines; and to raise 8,350,325*l.* to defray the charges of the war, &c.

That the electric fluid would emit sparks, discovered

1757.

Admiral Byng shot. The Duke of Cumberland goes to Hanover; has sundry battles with the French: Resigns, and Prince Ferdinand succeeds him—who obtains several victories over the Gallic troops, and recovers a number of places that had been in their possession. The Isle of Aix taken from the French. The French take and demolish Fort William Henry. Busbudgia, in Bengal, with sundry other places, are taken by the English. The Nabob's army is defeated: he is imprisoned, and put to death.

Admiral Watson dies. Parliament settles the supplies, which amount to 10,486,452*l.*

1758.

Several French vessels are taken by the English near Carthagena. The Prince George, of 80 guns, commanded by Rear-Admiral Broderick, on a passage to the Mediterranean, accidentally takes fire, and burns till she sinks: The admiral, with about 300 men, make their escape

A. D. 1758.

escape to land; and 500 perish. Lord Anson and Sir Edward Hawke sail to St. Malo. The British troops, under the command of the Duke of Marlborough, take possession, and burn a French fleet, consisting of 2 men of war, 33 privateers, and above 70 sail of merchant ships.

The English fleet and army leave St. Malo, and take possession of Cherburgh, where they destroy the famous basin, harbour and sluice, in that place. They leave Cherburgh, go to St. Briac, near St. Malo, and destroy about 15 small vessels. On re-embarking, the French fall on them, and kill and take about 1000 men. Gen. Drury and Sir John Armitage were among the slain.

Fort Louis and the town of Senegal taken by the English. Goree taken from the French by Commodore Keppel.

Fifty thousand English troops in America. Gen. Amherst and Admiral Boscawen take Cape Breton. The Island of St. John, in the Gulph of St. Lawrence, taken from the French by the English, under the command of Lieutenant-Colonel Lord Rollo. Gen. Abercrombie repulsed at Ticonderoga—where Lord Howe is slain.

Fort Frontinac taken from the French and Indians, by Col. Bradstreet: He destroys nine armed vessels belonging to the enemy.

Brigadier-General Forbes takes Fort du Quefne from the French.

The

A. D. 1758.

The English demolish a fort in Grand Ana Bay, in Martinico, and take four privateers from the French.

Prince Ferdinand, with the allied army, obtains great victories over the French in the Hanoverian dominions.

The Duke of Marlborough dies. Parliament grants 12,761,310l. 19s. 5d. to support the war.

1759.

The French and the Pretender meditate to invade England.

Admiral Rodney bombards Havre, and burns the stores intended for the invasion. The French abandon the town.

Admiral Boscawen cannonades the French at Toulon. Afterwards he takes two French men of war, and destroys two more, near Gibraltar.

Sir Edward Hawke blocks up the French fleet in the harbour of Brest, but is driven from thence by a storm. The French pursue, and are defeated by having a number of their ships destroyed by Sir Edward, which renders their intention of invading England abortive.

Guadaloupe taken by the English, commanded by Gen. Hopson and Barrington, with the islands Descada, Los Santos, and Marigalante, in the West Indies. The French in Canada induce the savages to commit the most horrid barbarities upon the subjects of New England. The English make peace with fifteen Indian nations. Gen. Amherst takes Ticonderago and Crown Point.

A. D. 1759.

Point. Sir William Johnson takes Niagara. Gen. Wolfe killed, Sept. 12. Quebec taken, Sept. 18. Col. Ford obtained a complete victory over the French near Masulipatam. Col. Maitland takes the town and castle of Suart. Vice-Admiral Pocock fights with a French fleet, and becomes master of the Indian coast. A Dutch Commodore refusing to let Captain Willoughby pass, the Captain reinforces Col. Coote on the coast of Coromandel, defeats the French, and takes four of the Commodore's ships; and also took Fort Wandewash. These victories were in the East Indies.

Minden, in Hanover, taken from the French by Prince Ferdinand.

Munster taken by Gen. Imhoff. Many more skirmishes happened in that country that year, in which the English and allied armies were victorious.

Parliament raises 16,130,561l. 9s. 8d. for defraying the charges of the war.

1760.

The French take Carrickfergus in Ireland, which they leave suddenly: are overtaken near the Isle of Man, by Capt. Elliot, Capt. Logie, and Capt. Clement. A smart engagement ensues, in which the French squadron are taken, and their Commander, M. de Thurot, is slain.

The Cherokee Indians on the back of North Carolina (instigated by the French) break the peace, and plunder and massacre many of the British subjects.

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The

A. D. 1760.

The Governor of North Carolina makes peace with them; but as soon as he had returned home, they attempted to surprize Fort George, killed all the English traders in their country, and massacred forty of the defenceless inhabitants.

Gen. Amherst sends Col. Montgomery with 1200 men, who chastised the Cherokees by destroying every village and house in the lower nation, putting great numbers to death, and bringing 40 women and children as prisoners to Fort George. Afterwards they made another excursion in the middle settlements, destroying all before them with fire and sword. The Indians, in revenge, attacked Fort London; and, after granting a capitulation, massacred the greatest part of the garrison.

M. de Levis, with 12,000 men, besieges Quebec. And Gen. Murray, with 3000 men, (Ap. 28.) marched out near three miles from the city, lost 1000 men in killed and wounded, and was obliged to retreat back to the city. On the arrival of an English fleet from Halifax, under the command of Lord Colville, the siege was raised, and the French fled to Montreal—where three English armies met afterwards; and Vaudreuil, the French Governor, finding himself entirely inclosed by the three armies, surrendered the garrison, with all Canada, Sept. 8, on condition that the French should enjoy their religion and effects; and that those of the
French

A. D. 1760.

French that chose to return to France, should be transported thither.

In the course of the summer, Captain Byron, with three ships, destroyed the French settlements in the Bay of Chaleur, where he took 3 frigates and 19 smaller vessels.

This year the walls of Cape Breton were demolished, and the implements of war, artillery and ammunition carried to Halifax, by order of his Britannic Majesty.

Arcot, Parmaçoil, Alumparva, Carical, and Pondicherry, in the East Indies, taken by the English.

The French army in Germany consisted of near 130,000 men, and the English of 25,000: the allied fell very short of the French army in numbers, but they exceeded in the quality of the troops. Many heavy battles were fought, and many victories obtained over the enemy.

King George II. dies, and King George III. begins to reign. The Commons grant upwards of '9,000,000*l.* for the service of the current year.

A. D. 1761.

Prince Ferdinand, with the allied army, obtains a victory over the French, who lose 5000 men in battle.

In another battle Prince Henry, brother to the hereditary Prince, is mortally wounded. Many skirmishes ensue.

Major Hector Monro takes Mahie, in the East Indies.

A. D. 1761.

Shah Zadda, a prince of the Mogul empire, joins the French in the East Indies, but is routed by the English troops, who take all their artillery, part of their baggage, and a number of French officers.

Lord Rollo, and Sir James Douglas, take the island of Dominique from the French in the West Indies.

Numbers of vessels are taken from the French this year, in different parts of the world.

The island of Belleisle taken from the French by Admiral Keppel, and Major-General Hodgson, June 7th.

The Commons settle the supplies which amounted to 18,229,135l. 18s. 11½d.

The Spaniards declare war against Great Britain.
1762.

England declares war against Spain.

Peter III. Emperor of Russia, is deposed, imprisoned, and murdered.

American Philosophical Society established at Philadelphia.

The English take Martinico, with all the Caribbee islands in the West Indies, from the French.

Havannah taken from the Spaniards by the English.
Manilla, in the East Indies, taken by the English from the Spaniards.

Sundry victories obtained over the French in Germany, by the English and the allied armies.

1763.

Peace established between Great Britain, France, Spain, and Portugal; and Canada, Nova Scotia,

A. D. 1763.

tia, East and West Florida, part of Louisiana, Granada, St. Vincent, Dominica, and Tobago, are confirmed to the British empire.

1764.

Parliament grants 10,000*l.* to Mr. Harrison for his discovery of longitude by his time-piece.

1765.

A Society of Artists incorporated in England.

Stamp act passed. The Americans oppose it. The merchants enter into a non-importation agreement.

Society of Arts, Manufactures and Commerce, instituted at New York, March 18.

Stamp act repealed.

April 21. A spot, or macula of the sun, more than thrice as big as this earth, passes over the centre of his body.

1768.

Academy of Painting established in London.

War declared between the Russians and Turks.

Great disturbances in America concerning duties laid by Parliament on glass, salt, &c.

The merchants agree, not to import superfluities from England. The Bostonians demolish the houses of the custom-house officers. Two regiments sent from Ireland, to support the civil power at Boston.

The King acquaints the Parliament with the conduct of the Americans.

96 public edifices, 4948 houses, and 1000 persons, destroyed by a hurricane at the Havannah.

A. D. 1769.

The Bostonians petition Parliament, praying that the revenue acts may be repealed.

The prayer of the petition not granted. Mention is made of the riots and tumults in Boston, &c. and Parliament resolves, that all acts made in the Colonies, which tended towards the throwing off the sovereignty of the British Parliament, were illegal and unconstitutional, and derogatory to the crown and dignity of his Majesty, &c.

A comet appears, with a very long tail.

1770.

The King acquaints the Parliament with the distracted condition of America.

Some of the merchants in England petition Parliament, praying that the duties might be taken off of fundry articles imported to America: their prayer is in part granted.

Mar. 5. Capt. Preston, of the 29th regiment, with a number of his men, being furrounded and abused by a mob, the mob is fired upon, and five are killed; which action was afterwards called by the Americans, *the Boston massacre*.

The King acquaints the Parliament with the condition of the Colonies in general, and the conduct of the Bostonians in particular.

250,000 people die of the plague in Poland.

1771.

Dr. Solander, Mr. Banks, and Lieut. Cooke, return to England from a voyage round the world,

A. D. 1771.

world, having made several important discoveries in the South Seas.

1772.

The King of Sweden changes the constitution from aristocracy to a limited monarchy.

The Emperor of Germany, Empress of Russia, and King of Prussia, strip the King of Poland of a great part of his dominions, which they divide among themselves, in violation of the most solemn treaties.

1773.

Capt. Phipps sent to explore the north pole; but is stopped by the ice at lat. 81 deg. N.

The Jesuits expelled the Pope's dominions.

The East India Company sends their cargoes of tea to consignees in America, Parliament having lowered the duty from 12 to 3d. per pound.

Dec. 16. A mob at Boston destroys 342 chests, by throwing it into the sea.

Died of a plague at Bassora, in Persia, 80,000 persons.

1774.

Peace proclaimed between the Russians and Turks.

The Americans deny that the British Parliament had a right to tax them.

Parliament passes an act for shutting up the port of Boston, till satisfaction should be made to the East India Company, &c.; and also another act, for regulating the government of the Massachusetts Bay, and for sending criminals to England to be tried, if justice could not be had in

A. D. 1774.

the Colonies. Also, an act was passed for the future government of Quebec, in which the Romish clergy were allowed the free exercise of their religion.

Gen. Gage arrives at Boston with a fleet and army. The port is shut up.

The Bostonians enter into a solemn league and covenant, not to export or import any commodities to or from Great Britain, nor to have connection or trade with any one so doing, till all their rights and charters should be restored to them.

Sept. 5. A Continental Congress meets at Philadelphia. The people in the Massachusetts mob the King's counsellors and other friends of Government, who flee to his Majesty's army for protection.

Committees of correspondence are chosen; the courts of justice are stopped; and many of the military officers resign their commissions in the Massachusetts.

Gen. Gage seizes the provincial stores in the Massachusetts, and fortifies the town of Boston, in consequence of the preparations for war in the colonies by the Americans.

The Representatives, without the advice and consent of the Governor and Council, proclaim a fast. And,

Some of the clergy, refusing to obey the proclamation, are treated as enemies to the country.

The millers not allowed to grind any grain for the friends of Government, nor the merchants and mechanics

A. D. 1774.

mechanics to have any correspondence with them. The printers were forbid to print for the tories; and the people were not allowed to drink tea, nor the clergy to pray for the King.

The people constrained to sign leagues and covenants; spend much time in making iraplements of war, and in running to trainings, town and committee meetings, county conventions, &c.

A proclamation issued in England to prevent the exportation of arms and ammunition to America.

The people in Rhode Island and New Hampshire seize and carry off the cannon and other property belonging to the crown, which was deposited in those governments.

Minute-men, or men to be ready at a minute's warning to fight against the King's troops, chosen in the Massachusetts.

A false report is spread, *viz.* that the King's troops had been from Boston to Cambridge, and had, without any provocation, killed six innocent people there. Whereupon the militia was raised in the Massachusetts, Connecticut, &c. and marched, in great multitudes, to take Boston; but, on finding they had been misinformed, returned back to their habitations.

1775.

April 19. The battle of Lexington.

May 10. Ticonderago taken from the British by Col. Ethan Allen.

May 14. Crown Point taken from the King's troops.

A. D. 1775.

May 25. Gen. Howe, Clinton, and Burgoyne, arrive at Boston.

June 17. Battle at Bunker's Hill: Charlestown burnt: Gen. Warren slain.

Aug. 23. The King issues a proclamation for the suppression of sedition and rebellion.

Oct. 18. The British fleet burns the town of Falmouth.

Dec. 10. Battle at Grave's Island in Virginia.

31. Gen. Montgomery slain at Quebec.

1776.

March 17. Boston evacuated by the British.

May 6. The siege of Quebec is raised.

June 28. Battle at Sullivan's Island.

July 4. Independency declared by Congress at Philadelphia.

July 11. The battle at Gwin's Island.

Aug. 27. Long Island taken by the British.

Sept. 15. New-York taken by the English.

Nov. 18. Fort Lee abandoned by the Americans.

20. Fort Washington taken by the British and Germans.

Dec. 26. Hessians taken at Trenton by the Americans.

1777.

Jan. 2. Battle at Princetown, in the Jerseys.

March 23. Stores destroyed at Peek's-kills by the British.

April 27. Danbury, in Connecticut, burnt by the English.

April 29. Gen. Wooster killed.

A. D. 1777.

- July 6. Ticonderago taken by the British.
 18. Gen. Prescott taken at Rhode Island by the Americans.
 Aug. 16. English defeated at Bennington, in Vermont.
 Aug. 28. Gen. Howe landed at the head of the Elk.
 Sept. 11. Battle at Brandywine.
 27. Philadelphia taken by Gen. Howe.
 Oct. 4. Battle at Germantown.
 7. Battle at Red Bank.
 9. Fort Montgomery taken by Sir Hen. Clinton.
 15. Esopus burnt by the British.
 17. Gen. Burgoyne surrendered at Saratoga.
 21. Red Bank, in Pennsylvania, attacked.
 Nov. 15. Mud Island taken.

1778.

- Feb. 6. An alliance made between France and the United States of America.
 April 13. The Earl of Carlisle, W. Eden, Esq. and Geo. Johnston, Esq. appointed Commissioners to restore peace to the Colonies: They arrive at Philadelphia—and Congress refuses to treat with them, &c.
 June 18. Philadelphia evacuated by the King's troops.
 June 28. St. Pierre and Miquelon taken from the French by Admiral Montague.
 —. Battle at Monmouth, in the Jerseys.
 July 27. Sea-fight off Brest, between Admiral Keppel and the French fleet.

July 27.

A. D. 1778.

- July 27. Count d'Estaing arrived at Rhode Island.
 Aug. 29. Battle at Rhode Island.
 Sept. 7. Dominica taken from the English by the French.
 Oct. 3. The Commissioners issue a manifesto and proclamation for restoring peace in America.
 Oct. 17. Pondicherry, in the East Indies, surrenders to the English.
 Dec. 28. St. Lucia taken from the French by the English.

1779.

- Jan. 4. Georgia surrendered to the British troops.
 —. St. Vincents taken by the French.
 July 3. Grenada taken by the French.
 6. Adm. Byron and Count d'Estaing fight.
 —. D'Estaing and Gen. Lincoln repulsed at Savannah in Georgia; and New Haven, in Connecticut, plundered by the British.
 July 9. Fairfield, in Connecticut, burnt by the English.
 July 12. Norfolk, in Connecticut, burnt by the King's troops.
 July 16. Stony Point taken from the British by the Americans.
 Aug. 14. Penobscott taken by the British from the Americans.
 Aug. 18. Paulus Hook taken from the British.
 Oct. 10. Coun. d'Estaing repulsed at Georgia.
 24. Omoa taken from the Spaniards.
 25. New Port evacuated by the British.

A. D. 1780.

A. D. 1780.

- Jan. 8. Admiral Rodney takes two sail of Spanish ships.
- Jan. 16. He takes and destroys seven Spanish ships of the line.
- March 14. Mobile taken by the Spaniards.
- April. Admiral Rodney fights in the West Indies.
9. West Florida surrenders to the King of Spain.
- May 12. Sir Henry Clinton takes Charlestown in South Carolina.
- May 17. Admiral Rodney fights with the French fleet.
- . A great riot in London. The rioters demolish some Romish chapels, Newgate, the King's Bench and Fleet prisons, also sundry private houses and other edifices in London and Southwark. The rioters were at length suppressed by the military, and many of them tried and executed for felony.
- May 19. A remarkable dark day in New England.
- Aug. 8. Five East Indiamen and 50 merchant ships taken from the English by the combined fleets of France and Spain.
- Aug. 16. Earl Cornwallis obtains a victory over Gen. Gates near Camden, South Carolina.
- . General Sumpter defeated by Col. Tarleton
- Sept. 3. Henry Laurens, Esq. who had been a president of Congress, taken by the English near Newfoundland.

Sept. 23.

A. D. 1780.

- Sept. 23. Major André taken by the Americans as a spy.
- Sept. 24. Gen. Arnold deserts, and goes to New-York, where he is made a Brigadier-General in the royal service.
- Oct. 2. Major André hanged as a spy at Tappan.
4. Mr. Laurens committed to the Tower in London, on a charge of high treason.
10. Dreadful hurricanes in the West Indies.
- Dec. 20. Declaration of hostilities against Holland.
- . Tarleton and Morgan fight.

1781.

- Jan. 6. The French repulsed at the island of Jersey.
11. Admiral Hughes takes Trincomale on the island of Ceylon.
- Feb. 3. St. Eustatia taken by the English from the Dutch.
- . St. Martin's, Saba, St. Bartholomew, taken from the French by the English.
- . Demerary and Essequibo, on the Spanish main, taken from the Dutch by the English.
- March 13. Dr. Herschel discovers a new planet, called *Georgium Sidus*, or *Herschel*.
- March 15. Earl Cornwallis obtains a victory over Gen. Green, at Guildford-court-house, North Carolina.
- Camden burnt by the British in South Carolina.
- Norfolk, in Virginia, burnt by Gen. Arnold.
- May 12. Negapatam taken.

June 2.

A. D. 1781.

- June 2. Tobago taken by the French from the English.
- Aug. 5. Admiral Parker fights with a Dutch fleet.
- Sept. 6. New London, in Connecticut, burnt by Gen. Arnold.
- . Lieut. Colonel Tarleton defeated *Sieur de Choise*.
- Sept. 7. French and English fight off Chesapeak Bay.
- October* Sept. 19. Lord Cornwallis surrenders to the French and Americans.

1782.

- Sir Eyre Coote obtains a victory over Hyder Ally.
- Jan. 14. Nevis taken by the French.
- Feb. 13. St. Christopher's taken from the English by the French.
- Feb. 25. Minorca taken from the English by the Spaniards.
- March 1. The House of Commons address the King against any further prosecution of the war in America; and resolve, that all those who should advise, or by any means attempt the further prosecution thereof, should be considered as enemies to his Majesty and the British nation.
- March 28. Holland acknowledges the independence of America.
- April 12. Admiral Rodney obtains a victory over the French fleet commanded by C. de Grasse, in the West Indies.
- April 13. Admiral Hughes had a severe engagement with the French fleet near the island of Ceylon,

A. D. 1782.

- Ceylon, in which a great number of men were lost on both sides.
- May 8. The island of Bahama taken by the Spaniards from the English.
- Aug. 29. The Royal George, of 110 guns, is overfet, and sunk in the English Channel, and about 900 people perish.
- Sept. 13. Gen. Elliot defeats the combined fleets of France and Spain at Gibraltar.
- Oct. 6. Peace proclaimed between Great Britain, France, and Spain. 1783
- Nov. 30. Provisional articles of peace signed at Paris between Great Britain and the United States of America.
- Dec. 20. Dr. STEARNS, having made calculations, publishes the first *Nautical Almanack* that ever was printed in America.

1783.

- Jan. 20. Preliminary articles of peace between his Britannic Majesty and the Kings of France and Spain signed at Versailles.
- April. An island rises out of the sea, near Iceland, issuing great quantities of fire from two of its eminences, like burning vulcanoes.
- Sept. 3. The definitive treaty of peace between Great Britain, France, Spain, and the United States of America, ratified.
- The British Fishing Society incorporated.

A. D. 1784.

- Jan. 14. Congress ratifies the definitive treaty of peace between Great Britain and America.

Jan. 16.

A. D. 1784.

Jan. 16. Congress issues a proclamation, recommending and strictly enjoining the citizens of the United States, to carry into effect every sentence and clause of the definitive treaty.

March. A comet appears.

May 20. The definitive treaty of peace between Great Britain and Holland signed at Paris.

July. Peace proclaimed ^{between} Great Britain ^{and} Holland and America.

Sept. 15. Lunardi ascends in an Air Balloon, the first attempt of the kind in England.

1786.

August 2. Margaret Nicholson, a lunatic, attempts to stab the King of England with a knife, in consequence of which she is sent to Bethlehem Hospital.

Sept. 19. A plan set forth in Great Britain for establishing a Colony in Botany Bay, in New Holland. A commercial treaty is signed at Versailles between England and France. An insurrection in the Massachusetts—The sitting of many of the courts of justice is stopped by the insurgents.

Congress recommends to the Legislative Assemblies of the United States, to repeal their laws, which had been suffered to exist and operate, that were repugnant to the definitive treaty of peace between Great Britain and America.

1787.

Jan. The insurgents under the command of Gen. Shays, still continue to impede the sitting of the courts of justice. The Legislative Assembly

D

bly

A. D. 1787.

bly raises an army, which was put under the command of Gen. Lincoln. Several skirmishes ensue, and some are killed on both sides. The insurgents desert Gen. Shays. He flees with his Head Officers to Canada. Many of the insurgents are afterwards tried for their lives. Some receive sentence of death; but are all, with their General, afterwards pardoned.

The Massachusetts, with sundry other States, repeal their laws that were repugnant to the articles of the peace.

Some disturbances in Holland, the male-contents desire to abridge the Stadtholder's power. The public tranquillity is restored. The Legislative Assemblies in the United States of America send a Convention to Philadelphia, in order to amend the articles of confederation and perpetual union between the States. The Convention frames a new constitution, which they call the Federal Constitution. This makes a great disturbance amongst the citizens.

1788.

Jan. 17. Lord George Gordon having been found guilty of publishing two libels, one against the Queen of France, and the other against the criminal jurisprudence of England, is sentenced to be imprisoned in Newgate three years, then to pay a fine of £500, and find security for his good behaviour for fourteen years.

26. Dr. STEARNS formed a new *Hypothesis* upon the cause of the *Aurora Borealis*.

Jan. 31.

A. D. 1788.

Jan. 31. Died at Rome, Prince Charles Lewis Cassimir Stuart, called the Pretender, aged 67 years and 2 months.

June 13. A provincial treaty of defensive alliance is signed by the ministers plenipotentiary of their Majesties the Kings of Great Britain and Prussia.

1789.

April 23. His Britannic Majesty, having been indisposed from Oct. 1788 till March 1789, appoints a thanksgiving, and visits St. Paul's.

24. General illumination on the King's recovery. Dr. Herschel discovers the 6th and 7th moons of Saturn. Great insurrections in Paris, occasioned by the people's paying enormous taxes, from which the nobility and clergy were exempt. The people carry their point in subjecting those classes to taxation, and contend for a right of representation, as forming one of the three estates, according to the constitution of Great Britain. They meet with opposition, but carry their point at last.

1790.

Jan. 26. Dr. STEARNS receives a letter from Dr. HERSCHEL, informing that Mrs. HERSCHEL, sister to the Doctor, discovered a comet on the 7th instant.

April 6. A violent shock of an earthquake at Oczakow, which destroyed a church, and did other damages.

May 27. London Bridge struck with lightning.

D 2

April

Jan. 31.

A. D. 1790.

April 20. Doctor Benjamin Franklin died, aged 84 years and 3 months.

July 14. *Democratical Constitution established in France.*

Dec. 23. A terrible storm of thunder, lightning, wind, hail, and rain; which did much damage in London and elsewhere, by overturning chimneys, houses, trees, &c.

Chronologists frequently contradict one another—hence their works are not always to be depended on. The Author has taken much pains to collect the best accounts that could possibly be obtained; and therefore flatters himself, that the preceding Tables are the most accurate of any that have hitherto been published.

C H A P. II.

A Description of the AUTHOR'S Philosophical Contemplations, Astronomical, and other Labours.

IN profound studies I take much delight,
 At high noon day, and in the silent night;
 Of wond'rous things I aim to find the cause,
 By diving into Nature's secret laws.
 Sometimes I sit, and with myself converse,
 And contemplate upon the universe;
 Sometimes, when on my downy bed I lie,
 My wand'ring thoughts to distant objects fly:
 Sometimes they're fixed on the splendid sun,
 To see the planets round his body run,
 In that position there to stand and gaze,
 Whilst rambling comets in the system blaze.
 Then, from the sun, my thoughts do take a flight
 To globes extended far beyond our sight:
 There I survey the works that DEUS made,
 When He the basis of great heaven laid;
 When He rais'd up the arches of the sky,
 And fram'd a num'rous train of worlds on high,
 Where suns, no doubt, do shine with splendid light,
 And planets roll, adorn'd with day and night,
 Where beings do perhaps their voices raise,
 In celebrating their Creator's praise!

When I've thus view'd the systems to and fro,
 My wand'ring thoughts descend to objects low:
 From upper worlds most rapidly they fall,
 To view God's works upon this earthly ball.

Here I gaze at the lands, the rocks, the seas,
 The num'rous plants, and diff'rent kinds of trees;
 The birds, the beasts, the fishes—all that be
 In air, in earth, and the extensive sea.
 I view the people all, both great and small,
 In kingdoms, towns, and cities large and tall;
 See their religion, customs, and their laws,
 Their times of peace, and times of bloody wars.
 The elements I view of ev'ry kind,
 And all their qualities do try to find.
 And whilst I'm thinking of great Nature's laws,
 I ask myself, what truly is the cause
 Why clouds arise? Why storms of rain and snow?
 Why fogs appear, and boist'rous winds do blow?
 Why tides spring up, and billows roar aloud?
 And the grum thunder rumbles thro' the cloud?
 Why flaming lightning often zigzag flies?
 And the mock suns appear within the skies?
 The meteors why? and why the northern light?
 And rainbow comes so frequent in our sight?
 Why other things so often do appear
 Within the earth's extensive atmosphere?
 Why inundations do so oft arise,
 And drown the people in a great surprize?
 Why mountains burn? and why the hills do shake?
 What thing it is that causes an earthquake?
 Why cities sink? and other places fall
 So low that they cannot be seen at all?
 Why lands rise, that ne'er were seen before?
 And hills spring up upon the rocky shore?
 Why stones fall downwards? Why the smokes arise
 Towards the regions of the upper skies?
 Why the hot flame the fuel doth consume,
 And where its gone when turned into fume?
 What makes the springs, in diff'rent kinds of soil,
 With a great heat from day to day to boil?
 Why water-spouts and whirlwinds do arise,
 And raise things up towards the azure skies?
 Why the broad sea, with a fine brilliant light,
 Doth look so fiery in the darkest night?

Why

Why the bright sun upon an axis turns,
 And, unconsum'd, his body ever burns?
 Why the ALMIGHTY gives its heat such force,
 Orders its motion, and directs its course?
 Why planets do in wond'rous order run,
 From age to age, around the splendid sun?
 Why this great globe, with unfeelt motion, rolls
 Upon an axis pointing to the poles?
 What makes the cold, and what doth make the heat?
 And the proud waves against the mountains beat?
 What brings the spring, the summer, and the fall,
 And winter time, upon this earthly ball?
 What makes the day? and what doth make the night?
 And what divides the darkness from the light?
 What makes the compass vary from the poles?
 And why the variation westward rolls?
 Why northern lights weren't seen upon the stage,
 Until men liv'd within the present age?

When in the morn I'm weary of my bed,
 I rise and write what came into my head,
 What I upon great Nature's laws had thought,
 What in the night had to my mind been brought:
 But still I find my thoughts, without controul,
 Upon a number of great objects roll.
 I go to work, and, with a steady mind,
 The planets places in their orbits find.
 For times not come I find their longitude,
 And compute their diurnal latitude;
 Their right ascensions, declinations too;
 Their risings, settings—all point out I do.
 Eclipses, transits, occultations, I
 Foretell how soon they will be drawing nigh.
 In obscurations of the shining sun,
 I find the course that the dark moon will run;
 Where her penumbra first will strike the globe,
 And bring thereon a doleful mourning robe!
 How far her shadow really will expand,
 And obumbrate the sea and solid land.
 I always aim to be exceeding sure
 To tell how long eclipses will endure:

When they'll begin, likewise how large they'll be;
And when their end the gazing world may see!

In the defections of the rambling moon,
(Which happens oft, at ev'ning, morn, and noon)
I find the magnitude of the earth's shade,
And how therein the Lunar globe will wade:
Whether one part, or whether there'll be all
The rays of Sol hid from the Lunar ball:
From these things only 'tis that I conclude,
What will be the eclipse's magnitude.
The best of rules observe I always do,
In occultations and in transits too.

Whilst at my studies I am sitting still,
I'm often call'd to visit persons ill:
Then I haste where malignant ills do rage,
And against them with all my skill engage.
Sometimes I bleed, sometimes I puke and purge:
I use such things as Nature seems to urge.
I am not fond of getting worldly pelf,
But use the poor just as I do myself.
The best of med'cines any one can choofe,
I to my patients orders give to use;
And to the sick cannot for conscience' sake,
Give things myself would not incline to take.
Unless I know of what a pill is made,
To give or take it always I'm afraid.
The use of *nostrums* therefore I despise,
With the whole train of quackish villanies.
I've often thought, that people, when they're ill,
Do take such things till they themselves do kill.
A man well skilled in the medic art,
Can have no need to act a knavish part:
Out of good simples, compounds he can make,
Fit for his patients and himself to take:
If he his med'cines doth incorporate,
He'll know their strength, and how they'll operate.
He'll ease the pained, and he'll give relief
To men and women overwhelm'd with grief;
As all of them may stand a chance to find
Themselves reliev'd according to their mind;

To get quite freed from all their racking pain,
Have health restor'd, and strength return'd again.
But if he knows not what he gives, I'm sure,
He nor his patients can't expect a cure.
Let all therefore who to physicians run,
The knavish quacks and all their *nostrums* shun ;
Lest they, like fools, do spend their cash in vain,
Take the *slow poison*, and at last be slain.

These are the ways that I, by night and day,
Do exercise as time rolls fast away.
The field I find, in which I did engage,
Is large enough for mortals on the stage ;
Who being weak, and very short in fight,
Know not some things hid by the *God of Might*.

Composed, A. D. 1790.

CHAP.

C H A P. III.

A Definition of ASTRONOMY—Where it is supposed it was first studied—The Names and Ages of some eminent Astronomers—Observations on those of Great Britain, France, and America—The great Utility of the Science—Qualifications necessary for those who calculate the Motions of the Celestial Luminaries.

ASTRONOMY is a science that teaches the distances, magnitudes, orders and motions of the heavenly bodies; and was a mystery hidden from ages and generations, until it was made known in these modern centuries, by the studies, observations, and improvements of ingenious men.—It has been said, that the Moors first studied the science, and that it was brought into Europe in 1201.—Some have also supposed, that the true theory of Astronomy took its rise in Egypt or Babylon, and that it was first taught by Pythagoras in Greece, who died 497 years before Christ.

After a long and dark night of oblivion, the Pythagorean System was revived by Copernicus of Thorn in Prussia, who died A. D. 1543, aged 70.—John Kepler, born at Wittenberg in Upper Saxony, in Germany, made a great progress in Astronomy;

Astronomy; he died 1630, aged 59.—Afterwards the celebrated Sir Isaac Newton, who was knighted by Queen Ann when he was about 62 years of age, brought the knowledge of this science to a high degree of perfection; he died 1727, aged 84.—We have also had several other eminent Astronomers in Great Britain besides Sir Isaac; as Mr. Flamsteed, who died 1718, aged 73.—Dr. Halley, who died 1742, aged 86.—Mr. Whiston, who died 1752, aged 85.—Dr. Bradley, who died 1762.—Mr. Mayor, famous for constructing Astronomical Tables, who died 1762.—A Mr. Robert Heath, who has been dead upwards of 20 years, if I mistake not; and a Mr. Fergussou, who died 1776.—At present there is the Rev. Dr. Maskelyne, Astronomer Royal, and the celebrated Dr. Herschel, who has made great discoveries and improvements in the divine science, as he has discovered one primary planet, *viz.* Georgium Sidus, and four secondary satellites, which had not been seen before. Two of these satellites revolve round Georgium Sidus, and the other two round Saturn.—The Doctor has also discovered, that the ring of Saturn has a rotation in about ten hours, as he informed me.

Dr. Herschel discovered the Georgium planet with a telescope about six feet in length; and he has lately constructed another, which is about 40 feet long, and 4 feet 9 inches in diameter. This is the largest I ever saw, and I believe of any in the world. It has enabled him to make the other discoveries.

I perceived

I perceived in July 1790, when I was at the Royal Observatory in Paris, that the French Astronomers are very accurate in taking observations.

I have not learnt that the American Astronomers have ever made any great discoveries or improvements in taking astronomical observations; but they have some eminent Calculators, as the celebrated Mr. West, Professor of Mathematics and Astronomy in the University in Rhode-Island Government—Dr. Low, and a Mr. George, of the Massachusetts—Mr. Strong, Dr. Perry, and Mr. Dabol, of Connecticut: but I am not acquainted with the Calculators in the Southern States.—I observed at Philadelphia, in 1783, that a number of Almanacks were published from one calculation, under fictitious names, as Father Abraham, Poor Will, Poor Richard, &c.; but could not learn who was the author. The same calculation was also published in the Jerseys, under some other name.

At New-York, an Almanack was published under the name of a Mr. Hutchens, who had been dead some years.

An Almanack was published in French, in Canada, when I was there, supposed to be calculated by a Mathematician in the Seminary in Quebec; but it was very deficient, as neither the Moon's place, rising, setting, or setting, was given.

I have made and published Astronomical Calculations for several Governments in America,
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for upwards of twenty years, annually calculated
for six meridians and latitudes; and have not
heard of any Astronomer that ever attempted to
calculate and publish a Nautical Almanack, in that
quarter, but myself; and I only undertook the
task once. The greatness of the work, and
the commotions that existed on account of the
war, obliged me to discontinue it.

There are two gentlemen in America, who are
said to be very accurate in the construction of
Orreries, *viz.* a Mr. Rittenhouse of Philadelphia,
and a Mr. Pope of Boston:---The former constructed
one that exceeded every thing of the like kind in
the world; and since that, the latter constructed
another, that exceeds the former: He made a
present of it to the President, Professors, &c. of
the University at Cambridge, in the Common-
wealth of Massachusetts; and the General Assembly
of that Republic gave him three hundred guineas
(as he informed me, when I saw him in London)
in consequence of his performance, and donation.

No science can be of greater utility to the human
race than Astronomy; for, by it, we not only
point out the longitudes and latitudes of the
planets, with their risings, southings, settings,
eclipses, transits, and occultations—but determine
many important things in chronology, navigation,
and surveying. Hence, if we had no knowledge
in this science, we should not be able to find the
limits of kingdoms and states, nor to steer a
vessel over the great oceans to the remote parts
of the globe, which would hinder our growing
rich by trade and commerce, and prevent our
receiving many of those foreign productions that
are

are necessary for the preservation of life; such as clothing, food, physic, &c.

There are but a few Astronomers on the globe, owing no doubt to the deepness of the mystery, and the extensiveness of the labour in attaining the knowledge necessary for a Professor of the divine science.

An Astronomer must be well skilled in every branch of the mathematics, *viz.* arithmetic, algebra, geometry, trigonometry, navigation, surveying, &c.; and if he undertakes to make calculations for one year only, he will find that he enters into a large field of business, and into a puzzling, perplexing, and intricate work, that will be attended with the expence of much time and hard study. A calculation that is made for one year, never will answer for another, by reason of the unsteadiness of the motions of the luminaries.

There are three kinds of Astronomers, if I may be allowed to use the expression, *viz.* One that marks the places of the stars, planets, and comets, by taking astronomical observations—One that points out their places for times to come, by astronomical calculations.— And another that represents their motions, by making mathematical machines, as orreries, artificial globes, and planetariums.

C H A P. IV.

*Of the Motions of the Primary and Secondary Planets—
 —Causes of the Eclipses, Transits, and Occultations
 —The Signs of the Zodiac, and the Number of the
 Northern and Southern Constellations—Astronomical
 Characters—Superstition of the Ancients.*

WE may reasonably suppose, that there are innumerable systems of worlds in the boundless expansion of the universe; and that the great fixed stars are suns to systems of planets and comets. But be this as it may, it has been demonstrated by astronomical observations,

I. That the sun is placed nearly in the centre of our system, and that it has no circular motion, only a rotation upon its axis.

II. That seven primary, and fourteen secondary planets, complete their revolutions round the sun, in their determinate or appointed times.

III. That the primaries are moved with an annual and a diurnal motion.

IV. That the secondaries revolve around their primaries, as the primaries do round the sun; and both are moved round the sun together, as the primaries complete their revolutions.

V. That some primaries have secondaries, and others have none.

VI. That our earth is a primary planet, and completes her revolution round the sun between the orbits of Mars and Venus.

VII. That Mars, Venus, and Mercury, have no moons or secondary planets; and that the earth has

one, Jupiter four, Saturn seven, and Georgium Sidus two.

VIII. That the orbits of the planets are not circular, but elliptical, and have different degrees of excentricity.

IX. That they are moved by a projectile force in their orbits, and a central force towards the sun.

X. That their motions are regular and uniform, and the areas they describe around the sun are proportionate to the times of their periods.

XI. That the squares of the times which the planets spend in revolving round the sun, are always proportionable to the cubes of their greatest distance from him. Hence the longer their orbits are, the longer will their revolutions be.

XII. That they all revolve through the twelve signs of the zodiac, which is a zone that is 18 deg. and 30 min. in breadth, in the middle of which is the ecliptic, or sun's path. Hence they make an angle with the ecliptic of 9 deg. and 15. min. called their north and south latitude.

XIII. That they revolve according to the order of the signs of the zodiac, but appear at different times to be direct, stationary, and retrograde; which pænomena arise from their various situations, and the velocity of the motion of the earth.

XIV. That when a primary planet is in that part of its orbit that is nearest to the sun, it is at its perihelion; but when it is most remote, it is at its aphelion.

XV. That when a secondary planet is in that part of its orbit that is nearest to its primary, it is at its perigeon; but when it is most remote, it is at its apogeon.

XVI. That

XVI. That the annual motion of the earth causes the spring, summer, autumn, and winter; but the diurnal causes the day and the night.

XVII. That an eclipse of the sun is caused by the moon's coming between the sun and the earth at the time of her change; and that of the moon by her falling into the earth's shadow at the time of her full, occasioned by the earth's coming between the sun and the moon.

XVIII. That the sun and moon cannot be eclipsed, only on the full and change days; and not always then, because she makes an angle with the ecliptic of 5 deg. and 18 min. and therefore often passes to the north or south of the sun at the time of her change, and to the north or south of the earth's shadow at the time of her full, without causing any eclipse.

XIX. That there cannot be more than seven, nor less than two eclipses in a year; but more happens of the sun than of the moon, by reason of his being greater than the earth's shadow.

XX. That the points where the moon's orbit intersects the ecliptic, are called her nodes; but they run retrograde, or contrary to the orders of the signs of the zodiac. Her menstrual motion, however, is always direct, or from west to east: and when she is three signs to the eastward of the sun, she is at her first quarter; when six signs, at her full; and when three signs west of the sun, at her last quarter.

XXI. That the moon is very unsteady in her motion, as her velocity is sometimes swift, and sometimes slow; the figure of her orbit being neither a circle, nor an ellipsis, nor a parabola.

XXII. That she always moves with the same face towards the earth, and her diurnal motion is equal to her menstrual motion, *viz.* 27 days and 8 hours. She has no light of her own, but shines with a borrowed light reflected from the sun. Hence she appears horned, halved, gibbous and round, according to her position in her orbit, and distance from the sun.

XXIII. That no planet, in all our system, is half so difficult to trace as the moon, and a calculation made for one year will not answer for another.— Hence Astronomers are obliged to make new calculations, as they do for the other planets, every year.

XXIV. Sometimes Venus and Mercury pass betwixt us and the sun, and appear like a dark spot on his disk. These eclipses are called transits, and there are more of Mercury than of Venus.

XXV. That the satellites of Georgium Sidus, Saturn and Jupiter, are easy to trace; and the quantities, durations, rest and affections of their eclipses (called occultations) are easily found by reason of the steadiness of their motions.

XXVI. That Mercury is situated the nearest to the sun of any planet in our system, and revolves between the sun and Venus. Venus revolves between the orbit of Mercury and that of the earth; the earth between Venus and Mars; Mars between the earth and Jupiter; Jupiter between Mars and Saturn; Saturn between Jupiter and Georgium Sidus; and Georgium Sidus between Saturn and the sphere of the fixed stars, which are placed at an
immense

immense distance from our system. *Vide* the figure of the solar system.

XXVII. That the signs of the zodiac are called constellations, each of which contains 30 degrees, each degree 60 minutes, and each minute 60 seconds, &c.

XXVIII. That north of the zodiac there are 36 constellations, and south of it 32; which numbers being added to those of the zodiac, make 80, and includes the whole canopy of the heavens.

XXIX. That the concave surface of the starry heavens, with the different constellations, are marked on the convex surface of an artificial celestial globe; and they are represented by the forms of various animals, whose names and figures are printed on the paper that covers the globe.

XXX. That the names of the northern constellations are,

LATIN NAMES.

ENGLISH NAMES.

Andromeda	Andromeda
Aquila cum Antineo	The eagle with Antionus
Anser cum Vulpecula	The goose with the fox
Auriga	The waggoner
Bootes	Bootes
Cassiopeia	The lady in her chair
Camelopardus	The cameleopard
Cepheus	Cephus
Coma Berenices	Berenices hair
Corona Septen.	The northern crown
Cygnus Gallina	The swan hen
Delphinus	The dolphin
Draco	The dragon

LATIN NAMES.	ENGLISH NAMES.
Equuleus Equifectio	The horse's head
Hercules	Hercules kneeling
Leo minor	The lesser lion
Lacerta	The lizard
Lynx	The lynx
Lyra	The harp
Perseus, C. M.	The Perseus
Pegasus Equus	The flying horse
Sagitta	The arrow
Serpens Ophiuchi	Serpentarius
Scutum	The shield
Serpentarius, or Ophiuchus	The serpent
Triangulum	The triangle
Urfa major	The great bear
Urfa minor	The little bear
Canes Vanatici	The dog greyhound.

XXXI. The characters and names of the constellations of the zodiac are,

LATIN NAMES.	ENGLISH NAMES.	
♈ Aries	The ram	Head
♉ Taurus	The bull	Neck
♊ Gemini	The twins	Arms
♋ Cancer	The crab	Breast
♌ Leo	The lion	Heart
♍ Virgo	The virgin	Belly
♎ Libra	The balance	Reins
♏ Scorpio	The scorpion	Secrets
♐ Sagittarius.	The archer	Thighs
♑ Capricornus	The goat	Knees
♒ Aquarius	The water-bearer	Legs
♓ Pisces.	The fishes	Feet

XXXII. That

XXXII. That the southern constellations are,

LATIN NAMES.	ENGLISH NAMES.
Ara cum thuribulo	The altar with a censer
Argo vel navis	The ship
Apus	The bird of paradise
Canis major	The greater dog
Canis minor	The lesser dog
Cetus	The whale
Centaurus cum lupe	The centaur with the wolf
Chameliontis	A chameleon
Columba Noahi	Noah's dove
Corona Australis	The southern crown
Corvus	The crow
Crater	The cup
Eridanus fluvius	The river
Grus	The crane
Hydrus	The water-adder
Lepus	The hare
Musca	The fly
Monoceres	The unicorn
Orion	Orion
Pavo	The peacock
Phœnix	The phenix
Piscis volans	The flying fish
Robur Carolinæ	The royal oak
Sextans	The sextant
Toncan	The American goose
Triangulum Austr.	The southern triangle
Dorado Xiphias	The sword fish

XXXIII. That various accounts have been given
by different Astronomers, of the number of the fixed
stars.

stars. Mr. Flamsteed, in the year 1689, supposed their number to be 3001, *viz.* 1511 in the northern hemisphere, 943 in the zodiac, and 547 in the southern hemisphere; and distinguished them by seven degrees of magnitude. But scarce 1000 can be discerned in Great Britain by the naked eye in a clear night. The stars, however, are so numerous, that no man on earth can number them; for by looking into Dr. Herschel's telescope, thousands and tens of thousands appear beyond those mentioned by Mr. Flamsteed.

XXXIV. That besides the astronomical characters annexed to the names of the signs of the zodiac, there are others which represent the stars, planets, and aspects:

LATIN NAMES.	ENGLISH.	GENDERS.
* Stella	A star	Feminine
☉ Sol	The sun	Masculine
☿ Mercurius	Mercury	Masculine
♀ Venus	Venus	Feminine
♁ Terra	The earth	Feminine
♂ Mars	Mars	Masculine
♃ Jovis	Jupiter	Masculine
♄ Saturnus	Saturn	Masculine
♁ Georgium Sidus	George's star	Masculine
☾ Luna	The moon	Feminine
7 *'s Pleiades	The seven stars	

XXXV. That when a planet is moving northward, it is in its ascending node, called the dragon's head, and marked ☊: and when it is moving southward, it is in its descending node, called the dragon's

dragon's tail, and is marked z . But when it intersects the ecliptic, it is in the node itself.

XXXVI. That the following characters represent the aspects, as when two planets are in the same degree, they are in conjunction, marked c

When 30 degrees apart,	Semifextile	SS
----- 60 -----	Sextile	*
----- 54 -----	Quintile	Q
----- 90 -----	Quartile	□
----- 120 -----	Trine	△
----- 144 -----	Biquintile	Bq
----- 150 -----	Quincunx	Vc
----- 180 -----	Opposition	z

XXXVII. That the Ancients supposed the moon had a great influence upon the human body, as she passed through the signs of the zodiac; that when she was in *Aries*, she governed the head; when in *Taurus*, the neck, &c.; and that it was unsafe to let blood in the head, or any other part, whilst she remained in that sign which governed the part. But I have found by my own experience and observation, in bleeding patients, that this hypothesis was founded altogether upon superstition.

This opinion was undoubtedly instilled into the Ancients by the Astrologers, who formerly imposed upon the ignorant world, by pretending that they could foretel future events by the motions of the heavenly bodies. But we still retain the ancient custom of representing the moon's place in the signs of the zodiac, by saying in our almanacks, *head, neck, arms, &c.*

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C H A P. V.

A Description of the Ecliptic, Poles, Equinoctial, Zenith, Nadir, Spheres, Latitude, Longitudes, Horizon, Hemispheres, Meridians, Amplitude, Right Ascension, Equinoxes, Azimuths, Cycles, Parallaxes, Tropics, Polar Circles, Solstices, Cardinal Points, Seasons of the Year, Zones, Semi-diurnal Arcs, Length of the Days, Square Miles on the Surface of the Globe, Number of Inhabitants, &c.

THE ecliptic is the path in the heavens which the sun appears to describe as the earth passes through the twelve signs of the zodiac. Aries, Taurus, Gemini, Cancer, Leo, and Virgo, are northern signs; Libra, Scorpio, Sagittarius, Capricornus, Aquarius, and Pisces, are southern.

2. The poles of the world are two fixed points in the heavens, diametrically opposite to each other, and a right line supposed to be drawn from each, is called the axis of the earth, about which the diurnal motion is performed.

3. The equinoctial line is a great circle, that surrounds the globe, at right angles, with the axis of the earth: it is 90 degrees from each pole, and intersects the ecliptic at the beginning of Aries and Libra. The length of the equinoctial is equal to the circumference of the globe, which is 360 degrees, or 21,600 geographic miles.

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A degree of the equator, and one of the ecliptic, and other great circles of the sphere, is supposed to be equal, though the latter is much longer than the former. The equator is divided into 24 equal parts, each containing 15 degrees, which are equal to an hour of time, as each degree is equal to four minutes.

4. The diameter of the earth from pole to pole is not quite so large as it is through the equinoctial, which is evident by her shadow in an eclipse of the moon; but the difference of the polar and equatorial diameters, arises, it is probable, from the expansion of the globe by the heat of the sun in the torrid zone, and the condensation of the same by the cold in the polar regions.

5. The zenith is the point directly over our heads; the nadir is the point directly under our feet; and when the sun, the moon, or a star is in the zenith, it is vertical.

6. There are three spheres, *viz.* a right, oblique, and parallel; as,

First, When a spectator is on the equator, he is in a right sphere; the poles of the world are in the horizon, and the equinoctial passes through the zenith and nadir. The equator, with its parallels, *viz.* the tropics and polar circles, make right angles with the horizon. The days and nights are equal as the sun, moon, and stars; are twelve hours above, and twelve below the horizon, at the times of the equinoxes.

Secondly,

A de-

Secondly, When a spectator is between the equator and the poles, he is in an oblique sphere. One pole is elevated less than 90 degrees above the horizon, and the other is depressed as many below.—The luminaries ascend and descend obliquely, tho' some of them that are situated near the poles never ascend at all. The days and nights are of different lengths, according to the different degrees of latitude, and the seasons of the year. The diurnal and nocturnal arcs of the sun vary in all parallels of latitude.

Thirdly, When a spectator is at either of the poles, he is in a parallel sphere. One pole is in the zenith, and the other is in the nadir. The equinoctial is parallel to the horizon; and all the parallels of the equator, *viz.* the tropics and polar circles, are also parallel to the horizon. The sun is half the year above, and half the year under the horizon, and the days and nights are six months in length. When our summer solstice happens, the sun at the north pole is 23 deg. 28 min. above the horizon; when the equinoxes happen, he is in the horizon; and when he is declined 18 degrees to the south, the twilight ends at the north pole, which remains in utter darkness till the sun returns within 18 degrees of the equator again, unless it is illuminated by the moon, the Aurora Borealis, &c.

7. The latitude of a place is its distance north or south of the equinoctial, and is always equal to the height of the pole above the horizon: hence, if a spectator is 20 degrees from the equator, that
will

will be the elevation of the pole, and, of course, the latitude of the place.

8. The longitude of a place is its distance from some first meridian, east or west, as that of the Royal Observatory at Greenwich; and every step we move, north or south, brings us into another latitude; and every step we travel, east or west, brings us into another longitude, and also into another meridian.

9. The horizon is a great circle of the sphere which divides the upper hemisphere, or half compass of the heavens, which is visible from the lower, which is invisible.

10. There are two horizons, *viz.* the sensible and the rational. The sensible is that which appears to a spectator placed on the surface of the globe; and the rational, that which would appear to him, if he was placed at, and could see from the centre. This horizon would divide the firmament into two equal parts, called the real and true horizon.

11. The hemisphere is that part of the heavens which is above the horizon; it is also one half of the globe, and likewise all the firmament that is below the horizon.

12. A meridian is a great circle passing through the poles of the world, and the zenith and nadir crossing the equinoctial at right angles, dividing the hemisphere into two equal parts, called the eastern and western hemispheres; and when the sun comes to the meridian, it is noon.

13. The

13. The meridian altitude of the sun, moon, or star, is its height above the horizon when it is on the meridian.
14. The semi-diurnal arc of the sun, moon, or star, is half the time it is above the horizon; and the semi-nocturnal arc is half of the time that it is below the same.
15. The amplitude of the sun, moon, or star, is an arch of the horizon between their rising or setting, and the eastern or western points thereof.
16. The ascensional difference of the sun, moon, or star, is the difference between the right and oblique ascension and descension, or the time they rise and set before and after six o'clock.
17. The longitude of the sun, planet, or star, is its distance from the vernal equinox, which is moveable about 50 seconds *per annum*, or its distance from the first star of Aries, which is immoveable.
18. The latitude of a planet is its distance from the ecliptic, as was before observed.
19. The heliocentric longitude of a planet is its place as seen from the sun, and the geocentric as seen from the earth. The same is to be observed with regard to the heliocentric and geocentric latitude.
20. The right ascension of the sun, moon, or star, are the degrees of the equinoctial, reckoned from the beginning of Aries, coming to the meridian with a star or planet, or to any hour circle at right angles with the equinoctial.
21. The precession of the equinoxes are the going back of the equinoctial points 50 seconds in a year,

year, caused by the earth's spheroidal figure in its diurnal motion; it will complete a revolution in about 25,920 years. This revolution is called the Platonic Year, at the period of which the Ancients supposed that every thing will come round in the same order they then were.

22. When a star rises as the sun sets, it rises achronically; when it sets with the sun, it sets achronically. When it rises with the sun, it rises cosmically; when it sets as the sun rises, it sets cosmically. When a star emerges from the sun's light westward, so as to be seen in the morning before the sun rises, it rises heliacally; when a planet emerges eastward from the rays of the sun, so as to be visible in the evening, it sets heliacally.

23. The anomaly of a planet is its angular distance from its aphelion.

24. Azimuth circles are verticle circles passing through the zenith and nadir.

25. The cycle of the sun is a revolution of 28 years, and that of the moon a revolution of 19 years.

26. The elongation of a planet is its angular distance from the sun as seen from the earth. The greatest elongation of Mercury is 28 deg. 21 min. 8 sec. and that of Venus 47 deg. 38 min. 35 sec. — Venus and Mercury are called inferior planets; Georgium Sid' s, Saturn, Jupiter, &c. superior.

27. The parallax of a planet is the difference between its true place, as seen from the earth's centre, and its apparent place as seen from the earth's surface.

28. The

28. The parallax of the annual orb is the angle the earth would appear under to the eye, at each planet, to be elongated from the sun; being greatest and least at the extreme positions.

29. There are two spheres besides those already mentioned, *viz.* the celestial sphere and the terrestrial. The terrestrial circles and poles of the earth are supposed to be extended to the heavens. Hence, if two stars should be found in those points, they would be called pole stars; but as there are not any visible stars in these points, the nearest to them are called by that name.

30. The ecliptic hath poles and circles; these poles make an angle with those of the earth of 23 deg. 28 min. The circles of the ecliptic are called the circles of the celestial longitude; and those parallel to the ecliptic, circles of the celestial latitude.

31. If the axis of the earth was perpendicular to the plane of the ecliptic, there would be no declination from the equinoctial points; the equator, the tropics, polar circles, and the poles, upon that side of the globe next the sun, would always be illuminated, and the days and nights equal. But the axis being inclined 23 deg. 28 min. to the plane of the ecliptic, and keeping obliquely and in a parallel position to itself through each revolution, produces the spring, summer, autumn and winter, and the inequality of the days and nights.

32. The angle that the equinoctial makes with the ecliptic, is called the sun's declination, and is equal to 23 deg. 28 min. It is half the year north, and half the year south of the equinox. From the

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20th of March to the 23d of September, his decli-
nation is north; and from thence to the 20th of
March, it is south. When the sun enters Aries,
the vernal equinox happens; when he enters Can-
cer, the summer solstice happens; when he enters
Libra, the autumnal equinox happens; and when
he enters Capricorn, the winter solstice happens.
The equinoxes and solstices are called the four
cardinal points. The summer solstice happens
about the 21st of June; then the days are the longest
in the northern latitudes, but shortest in the sou-
thern. The winter solstice happens Dec. 21. then
the days are the shortest in the northern, but
longest in the southern latitudes: but the days and
nights are of an equal length at the times of the
equinoxes. The summer half-year is about nine
days longer than the winter half-year, owing to
the earth's being nearer to the sun in the winter
than she is in the summer, which quickens the
rapidity of her motion; for the nearer a planet or
comet is to the sun, the swifter will their motions
be: therefore the earth passes quicker through the
southern than the northern signs; for it is about
nine days longer in going from the vernal equinox
to the autumnal, than it is in going from the latter
to the former. Let us compute —

SUMMER

SUMMER HALF-YEAR.		WINTER HALF-YEAR.	
	<i>Days.</i>		<i>Days.</i>
March	11	Sept.	7
April	30	Oct.	31
May	31	Nov.	30
June	30	Dec.	31
July	31	Jan.	31
Aug.	31	Feb.	28
Sept.	23	March	20
	<hr/>		<hr/>
	187		178
Subtract	178		
	<hr/>		

Difference 9 days. *Quod erat demonstrandum.*

33. The terraqueous globe is divided into five parts called zones, *viz.* one torrid, two temperate, and two frigid zones. The torrid is 46 deg. 56 min. in breadth, and limits the sun's greatest declination north and south. It is bounded northerly on the tropic of Cancer, and southerly on the tropic of Capricorn. In this zone the heat is very extreme, and the sun rises and sets 46 deg. 56 min. farther to the south at the time of the winter solstice, than it doth at the time of the summer solstice. The moon rises and sets 57 deg. 32 min. and the other planets 65 deg. 26 min. further to the south at some times, than they do when they are at their greatest declination northerly. And as the declination of the moon and planets is often greater than that of the sun, by reason of their latitude from the ecliptic, their semi-diurnal and

ER HALF-YEAR.

Days.

Sept.	7
Oct.	31
Nov.	30
Dec.	31
Jan.	31
Feb.	28
March	20

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divided into five
 two temperate,
 is 46 deg. 56
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and semi-nocturnal arcs are frequently longer than those of the sun. The sun is always verticle in some part of the torrid zone, and he is always rising and always setting in some parts of the globe.

The temperate zones are situated between the torrid and the frigid zones, and each of them are 43 deg. 4 min. in breadth.

The northern temperate zone is bounded by the arctic circle on the north, and by the tropic of Cancer on the south. The southern temperate zone is bounded northerly by the tropic of Capricorn, and southerly by the antarctic circle. In these zones the heat is not so extreme as it is in the torrid, nor the cold as it is in the frigid zones.

The frigid zones are each of them 23 deg. 28 min. broad. The northerly one is bounded north by the north pole, and southerly by the arctic circle. The southerly frigid zone is bounded north by the antarctic circle, and southerly by the south pole.— The cold is very extreme in these zones.

34. When the sun's declination is the greatest northerly, his semi-diurnal arc at Philadelphia, or in the latitude 40 deg. north, is *7h. 29m.*

When the moon's is the greatest north,
 her semi-nocturnal arc is - *7— 53—*

When the other planets are the greatest
 north, &c. - - *8— 13—*

The moon's semi-nocturnal arc is longer
 than the sun's, by - - *0— 24—*

Planets longer than, &c. - *0— 44—*

F

The

	<i>Deg.</i>	<i>Min.</i>
The sun's greatest declination is	23	28
The moon's greatest declination is	28	46
Jupiter's greatest declination is	32	43
<hr/>		
The moon's declination greater than the sun's	5	18
<hr/>		
The planets declination is greater than the sun's, by	9	15

35. There is a considerable variation in the length of the days in the capital towns and cities in North America. At Quebec, at the time of the summer solstice, the days are 15^h. 50^m. long

At Boston	15—14—	-----
At New-York	15— 2—	-----
At Philadelphia	14—58—	-----
At Charlestown	14—16—	-----

Longer at Quebec than Boston	0—36—	-----
—— at ditto than New-York	0—48—	-----
—— at ditto than Philadelphia	0—52—	-----
—— at ditto than Charlestown	1—34—	-----

Deduct the length of the day from 24 hours, and the remainder will be the length of the night :

Thus—	24— 0—	-----
Length at Quebec	15—50—	-----
<hr/>		
Length of the night	8—10—	-----

Astronomers do not agree about the lengths of the days at the above places; but I have constructed this

E.

Deg. Min.

23 28

28 46

32 43

in the

5 18

than

9 15

variation in the

owns and cities

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5b. 50m. long

15— 14— ----

15— 2— ----

14— 58— ----

14— 16— ----

0— 36— ----

0— 48— ----

0— 52— ----

1— 34— ----

24— 0— ----

15— 50— ----

8— 10— ----

the lengths of

have constructed

this

this calculation according to the direction given by a celebrated Royal Astronomer.

36. The terraqueous globe is composed of land and water, and near three quarters of its surface is supposed to be overwhelmed with the watery element.

There are four great continents, viz. Europe, Africa, Asia, and America; and also the continents near the poles: the northern is called Terra Arctica, and the southern Terra Antarctica.

There are five great oceans, viz. the Northern, the Pacific, Southern, Indian, and Atlantic.

The Northern Ocean flows along between the arctic continent and the northern parts of Europe, Asia, and America.

The Pacific, which is about 11,000 miles from north to south, and 10,000 from east to west, washes the western and north-western shores of America, and the eastern and north-eastern shores of Asia.

The Southern Ocean lies southward of America and Africa, joins the Pacific Ocean to the southward, and reaches some parts of the antarctic continent. Its extent is not yet known.

The Indian Ocean is bounded by Asia on the north, extends to the Pacific on the east, and to part of the southern antarctic continent. It is between seven and eight thousand miles from north to south, and four thousand from east to west.

The Atlantic divides Europe and Africa from America, bounds on the Indian and Southern Oceans, and is about six thousand miles from north

to fouth, and three and four thousand from east to west.

Besides oceans, there are seas, bays, gulphs, straits, lakes, ponds, rivers, &c. on the surface of the globe; and besides continents, there are islands, peninsulas, isthmuses, promontories, capes or headlands, &c. though some of these join to the *terra firma*.

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CONTENTS OF THE GLOBE.

The Superficial Contents of the GLOBE are estimated as follows :

	Sq. miles.	ISLANDS.	Sq. miles.	ISLANDS.	Sq. m.
The Globe	199,512,595	Hispaniola	36,000	Skye	900
Seas and unknown Parts	160,522,026	Newfoundland	35,500	Lewis	880
The Habitable World	38,990,569	Ceylon	27,730	Funen	768
Europe	4,456,065	Ireland	27,457	Yvica	625
Afa	10,768,823	Formosa	17,000	Minorca	520
Africa	9,654,807	Anian	11,900	Rhodes	480
America	14,110,874	Gilelo	10,400	Cephalonia	400
Perfian Empire under Darius	1,650,000	Sicily	9,400	Amboyna	400
Roman Empire, in its utmost height	1,610,000	Timor	7,800	Orkney Pomona	324
Ruffian	3,303,485	Sardinia	6,600	Scio	300
Chinefe	1,749,000	Cyprus	6,300	Martinico	260
Great Mogul	1,116,000	Jamaica	6,000	Lemnos	220
Turkish	960,057	Flores	6,000	Corfu	194
Perfent Perfian	800,000	Ceram	5,400	Providence	168
ISLANDS.		Breton	4,000	Man	160
Borneo	228,000	Scotora	3,600	Bornholm	160
Madagafcar	168,000	Candia	3,220	Wight	150
Sumatra	129,000	Porto Rico	3,200	Malta	150
Japau	118,000	Corfica	1,520	Barbadoes	140
Great Britain	72,926	Zealand	1,935	Zant	120
Celebes	68,400	Majorca	1,400	Antigua	100
Manilla	58,500	St. Jago	1,400	St. Christoph's	80
Iceland	46,000	Negropont	1,300	St. Helena	80
Terra del fuego	42,075	Teneriff	1,272	Guernsey	50
Mindinao	39,200	Gotland	1,000	Jerfy	43
Cuba	38,400	Madeira	950	Bermudas	40
Juva	38,250	St. Michael	920	Rhode	36

The

The number of inhabitants in the known world, according to the best computations, are estimated at 953 millions : Of which Europe contains 153 ; Asia, 500 ; Africa, 150 ; and America, 150 millions.

The inhabitants of the United American States, according to an account published in the Massachusetts Register for the present year, 1790, are as follows : VIZ.

<i>States.</i>	<i>Chief Towns.</i>	<i>Inhabitants.</i>
1. New Hampshire	Portsmouth	102,000
2. Massachusetts	Boston	360,000
3. Connecticut	Hartford	202,000
4. Rhode-Island	New-Port	58,000
5. New-York	New-York	238,000
6. New-Jersey	Trenton	138,000
7. Pennsylvania	Philadelphie	360,000
8. Delaware	Wilmington	37,000
9. Maryland	Baltimore	218,000
10. Virginia	Richmond	420,000
11. North Carolina	Newburn	200,000
12. South Carolina	Charlestown	150,000
13. Georgia	Savannah	90,000
14. Vermont	Bennington	200,000
Total	- - -	2,773,000

The inhabitants of Vermont were not mentioned in the Register. I received the account by a news-paper.

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 contains 153 ;
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Inhabitants.

- 102,000
- 360,000
- 202,000
- 58,000
- 238,000
- 138,000
- 360,000
- 37,000
- 218,000
- 420,000
- 200,000
- 150,000
- 90,000
- 200,000

2,773,000

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Presidents

Presidents that have been chosen in the Continental Congress.

- | | |
|-----------------------------|-----------------|
| 1. Peyton Randolph, Esq. | Of Virginia |
| 2. John Hancock, Esq. | — Massachusetts |
| 3. Henry Laurens, Esq. | — So. Carolina |
| 4. John Jay, Esq. | — New-York |
| 5. Samuel Huntington, Esq. | — Connecticut |
| 6. John Hanson, Esq. | — Maryland |
| 7. Elias Boudinot, Esq. | — New-Jersey |
| 8. Thomas Mifflin, Esq. | — Pennsylvania |
| 9. Richard Henry Lee, Esq. | — Virginia |
| 10. Arthur St. Clair, Esq. | — Pennsylvania |
| 11. Cyrus Griffen, Esq. | — Virginia |
| 12. George Washington, Esq. | — Virginia |

CLIMATES.

37. There are 30 climates between the equator and each of the poles. In the first 24, the days increase by half-hours ; but in the remaining six, between the polar circles and the poles, the days increase by months.

The following Table exhibits the northern and southern boundaries of each climate, with their breadth, and the length of the days.

Clim.	Latitude.		Breadth.		Longest Day.	
	o	1	o	1	H.	M.
1	8	25	8	25	12	30
2	16	25	8	0	13	0
3	23	50	7	25	13	30
4	30	25	6	30	14	0
5	36	28	6	8	14	30
6	41	22	4	54	15	0
7	45	29	4	7	15	30
8	49	1	3	32	16	0
9	52	0	2	57	16	30
10	54	27	2	29	17	0
11	56	37	2	10	17	30
12	58	29	1	52	18	0
13	59	58	1	29	18	30
14	61	18	1	20	19	0
15	62	25	1	7	19	30
16	63	22		57	20	0
17	6	6		44	20	30
18	64	49		43	21	0
19	65	21		32	21	30
20	65	47		22	22	0
21	66	6		19	22	30
22	66	20		14	23	0
23	66	28		8	23	30
24	66	31		3	24	0
25	67	21		1	Month	
26	69	48		2	Months	
27	73	37		3	Months	
28	78	30		4	Months	
29	84	5		5	Months	
30	90	0		6	Months	

Countries in the different Climates North of the Equinoctial Line.

I. Within the first climate, lie the gold and silver coast in Africa; Malacca, in the East Indies; Cayenne and Surinam, in Terra Firma, South America.

II. Here lie Abyssinia, in Africa; Siam, Madras, and Pondicherry, in the East Indies; Straits of Darien,

Darien, between North and South America; Tobago, the Grenades, St. Vincent, and Barbadoes, in the West Indies.

III. Mecca, in Arabia; Bombay, part of Bengal, in the East Indies; Canton, in China; Mexico, Bay of Campeachy, in North America; Jamaica, Hispaniola; St. Christopher's, Antigua, Martinico, and Guadaloupe, in the West Indies.

IV. Egypt, and the Canary islands, in Africa; Delly, capital of Mogul empire, in Asia; Gulph of Mexico, and East Florida, in North America; the Havannah, in the West Indies.

V. Gibraltar, in Spain; part of the Mediterranean Sea; the Barbary coast, in Africa; Jerufalem, Ispahan, capital of Persia; Nankir, in China; California, New Mexico; West Florida, Georgia, and the Carolinas, in North America.

VI. Lisbon, in Portugal; Madrid, in Spain; Minorca, Sardinia, and part of Greece, in the Mediterranean; Asia Minor; Part of the Caspian Sea; Samarcand, in Great Tartary; Pekin, in China; Corea and Japan; Williamsburg, in Virginia; Maryland and Philadelphia.

VII. Northern provinces of Spain; southern provinces of France; Turin, Genoa, and Rome, in Italy; Constantinople, and the Black Sea, in Turkey; the Caspian Sea, and part of Tartary; New-York, and Boston, in New England.

VIII. Paris, Vienna, capital of Germany; New-Scotland, Newfoundland, and Canada.

IX. London,

Day
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old and silver
Indies; Cay-
South America.
am, Madras,
; Straits of
Darien,

- IX. London, Flanders, Prague, Dresden ; Cracow, in Poland ; southern provinces of Russia, part of Tartary ; north part of Newfoundland.
- X. Dublin, York, Holland, Hanover, and Tartary ; Warsaw, in Poland ; Labrador, and New South Wales, in North America.
- XI. Edinburgh, Copenhagen, Moscow, Cape of Russia.
- XII. South part of Sweden ; Tobolski, Cape of Siberia.
- XIII. Orkney Isles, Stockholm, capital of Sweden.
- XIV. Bergen, in Norway ; Petersburg, in Russia.
- XV. Hudson's Straits, North America.
- XVI. Siberia, and the South-west part of Greenland.
- XVII. Drontheim, in Norway.
- XVIII. Part of Finland, in Russia.
- XIX. Archangel, on the White Sea, Russia.
- XX. Hecla, in Iceland.
- XXI. Northern parts of Russia and Siberia.
- XXII. New North Wales, in North America.
- XXIII. Davis's Straits, in ditto.
- XXIV. Samoieda.
- XXV. South part of Lapland.
- XXVI. West Greenland.
- XXVII. Zembla Australis.
- XXVIII. Zembla Borealis.
- XXIX. Spitzbergen, or East Greenland.
- XXX. Unknown.

A degree of latitude is 60 geographic miles, which is equal to about $69\frac{1}{2}$ miles British measure;— and a degree of longitude is of the same length on the equator: But the degrees decrease in all parallels of latitude between the equinoctial and the poles, and at those places they come to a point. The subsequent TABLE exhibits the variation, or decrease, in geographic miles, and hundredths of miles, in all the intermediate degrees of latitude.

Deg. Lat.	Long Miles	100th part of a mile.	Deg. Lat.	Long Miles	100th part of a mile.	Deg. Lat.	Long Miles	100th part of a mile.
1	59	96	31	51	43	61	29	4
2	59	94	32	50	88	62	28	17
3	59	92	33	50	32	63	27	24
4	59	86	34	49	74	64	26	30
5	59	77	35	49	15	65	25	36
6	59	67	36	48	54	66	24	41
7	59	56	37	47	92	67	23	45
8	59	40	38	47	28	68	22	48
9	59	20	39	46	62	69	21	51
10	59	8	40	46	0	70	20	52
11	58	89	41	45	28	71	19	54
12	58	68	42	44	95	72	18	55
13	58	46	43	43	88	73	17	54
14	58	22	44	43	16	74	16	53
15	58	0	45	42	43	75	15	52
16	57	60	46	41	68	76	14	51
17	57	30	47	41	0	77	13	50
18	57	4	48	40	15	78	12	48
19	56	73	49	39	36	79	11	45
20	56	38	50	38	57	80	10	42
21	56	0	51	37	73	81	9	38
22	55	63	52	37	0	82	8	35
23	55	23	53	36	18	83	7	32
24	54	81	54	35	26	84	6	28
25	54	38	55	34	41	85	5	23
26	54	0	56	33	55	86	4	18
27	53	44	57	32	67	87	3	14
28	53	0	58	31	79	88	2	9
29	52	48	59	30	90	89	1	5
30	51	96	60	30	0	90	0	0

C H A P. VI.

Of the Circumference and Diameter of the Earth's Orbit, and her Diurnal Motion—Why the Style was, and ought to be altered—Of the Division of Time—When different Nations begin their Days—Of the Birth and Crucifixion of CHRIST—The reputed Æra not the true Æra of his Birth, which is demonstrated by Astronomical Calculations—Of the Clock Equations—How to regulate a Clock, &c.

THE mean distance of the earth from the sun is about 81 millions of geographic miles, and the circumference of her orb is 509 $\frac{1}{2}$ millions, and she travels about 1,394,520 miles in twenty-four hours—a motion much more rapid than that of a cannon-ball. Her diurnal motion is 21,600 miles in a day.

Her revolution round the sun is completed in 365 days 5 hours 48 minutes and 57 seconds of time; and by reason of those odd hours, minutes and seconds, we are obliged to add one day to the month of February, every fourth year, to make the years agree as near as possible to the earth's revolutions; but as there are 11 minutes and 3 seconds wanting in each year to make 6 hours, the time is
carried

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Why the Style
the Division of
their Days—
CHRIST—The
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Calculations—Of
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nd 3 seconds
, the time is
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carried forward 44 minutes and 12 seconds in the space of four years. At this rate, it advances 18 hours and 25 minutes every century, and 1 whole day, or 24 hours, in something more than 130 years and three months and an half. From hence arises the necessity of altering the style; for if it was not altered, the season of the year that now happens in the middle of July, would fall in the middle of January, in about 23,725 years. The style was altered or brought back eleven days in 1752; and since that period, the time has run forward 6 hours 59 minutes and 54 seconds; and in 1882, it will be time to bring it back a whole day, or alter the style again.

Time is divided by us into centuries, years, months, weeks, days, hours, minutes, seconds, &c. A century is a revolution of 100 years. A year is one revolution of the earth through the signs of the zodiac. A month is the quantity of time that the earth spends in passing through one sign, called a yearly or a calendar month. A week is 7 days; 24 hours is a day; 60 minutes is an hour, and 60 seconds a minute. Four weeks is called a weekly month.

Common or civil years are of different lengths, according to the custom of different nations.—Some reckon their year by solar, and some by lunar motion.

The civil year contains 365 days for three years, which are called common years; and every fourth year contains 366 days, called Bissextile, or Leap Year. The civil years are also called Julian Years, because

because Julius Cæsar was the first person who added one day to every fourth year.

The civil, or common lunar year, contains 12 lunations, or 354 days; which is 11 days shorter than the solar. Therefore, to supply this defect, and make the lunar correspond with the solar time, the Jews added 30 days to every third year: but that was not enough by about 30 days and 18 hours, to make those reckonings agree. Twelve lunations was called the *complete*, and the addition of the 30 days the *vacant* or *embolimic* year. The first Romans used the Jewish mode of reckoning; and afterwards Julius Cæsar introduced his mode of computation: but as his mode was deficient, and the time had advanced too forward, Pope Gregory, in 1582, ordered that ten days should be added to the 5th of October—which brought the seasons back to their proper places—and the 5th of this month was called the 15th.

Astronomers begin their day at noon—the Jews began their days at the setting of the sun; (hence it is said in the Scripture, that the evening and the morning was the first day:)—the Christians begin their days at midnight; and the ancient Babylonians, Persians, Syrians, and modern Greeks, begin their days at the rising of the sun.

There are two kinds of hours—an equal, and an unequal. An equal hour is one 24th of a mean day, measured by a regulated clock. An unequal, is one-twelfth part of the time that the sun is above the horizon; and the longer the days are, the longer will the hours be.—The Jews made their

their hours in this manner, and reckoned time by saying, the first, second, third, &c. hour of the day, or the first, second, third, &c. hour of the night.

The sun rises and sets at Boston, in America, about seven hours later than it does at Jerusalem, and about four hours and forty minutes later than it doth at London.

The common æra of Christ is four years later than the true æra: hence what we call 1790, ought to be called 1794; for he was born before the death of Herod the Great, who sought to kill him as soon as he heard of his birth. And, according to the testimony of Josephus, (b. xv. c. 8.) there was an eclipse of the moon in the time of Herod's last sickness, a little before his death;—which eclipse some astronomical tables shew to have happened in the 4710th year of the Julian period, March 13th, 3h. 21m. after midnight, at Jerusalem. Now Christ must have been born some months before Herod's death; because, in the interval between his birth and Herod's death, he was carried into Egypt for the preservation of his life.—His birth therefore must be about four years before the reputed æra.

Christ died in the 4746th year of the Julian period, on Friday the third of April, in the 33d year of his age, according to the reputed æra—or 37th, according to the true æra, discovered by the eclipse of the moon already mentioned. He was put on the cross about noon, and expired at about three in the evening, the whole neighbourhood of Jerusalem being overspread with a miraculous darkness

darkness during the time of his suffering. A heathen writer, *viz.* Phlegon, the Trallian, for want of knowledge in Astronomy, imputed the cause of this darkness to an eclipse of the sun; but as the moon was near her full, there could not be any eclipse of the sun by her interposition at that time.

There are but four days in a year, in which a clock, or watch, that measures time even, will agree with the sun, *viz.* April 15, June 16, August 31, and December 24. At all other times, he will be too fast or too slow. From Dec. 24, to April 15, he will be too slow; from thence, to June 15, too fast: from thence to August 31, slower; and from thence to Dec. 24, too fast. This variation is called the equation of time.

The greatest equations are as follow, *viz.*

Feb. 10.	} the sun will vary	{	14 m. 41 s. too slow
May 14.			4 m. 2 s. too fast
July 25.			5 m. 58 s. too slow
Nov. 1.			16 m. 11 s. too fast.

These variations arise from the inequalities of the earth's motion, which performs her diurnal rotations sooner at one time than she doth at another. When the sun agrees with the clock that measures time even, the rotation is performed exactly in 24 hours; but when he is too fast of the clock, the rotation is performed in less than 24 hours; and when it is too slow, it is performed in more, &c.

One apparent revolution of the sun to the meridian, will be lost by a planet moving round him—in the same manner that a traveller would lose a day going

going round the earth the same way with the apparent motion of the sun, who would reckon one day less at his return than the inhabitants remaining at the place of his setting out, whatever number of days he had spent in going round the globe.

Hence we have two years, *viz.* the solar and the sidereal. The former contains something more than 365 revolutions of the sun to the meridian, and the latter upwards of 366 revolutions of a fixed star to the same meridian.—Hence also we have two kinds of days, *viz.* a solar and a sidereal. The solar is that quantity of time that the sun spends in going from a meridian till he returns to it again; the sidereal is the time that a fixed star spends in departing from a meridian till it returns again. A mean solar day is equal to 24 hours; a mean sidereal, to 23 hours 56 minutes 4 seconds.

How to regulate a Clock or Watch.

Observe through a small hole in a window-shutter the time any fixed star disappears behind a chimney, or any other object at a small distance; and if on the succeeding night it comes to the meridian 3 minutes 56 seconds sooner by the clock or watch, and on the next night 7 minutes 52 seconds sooner, the next night 11 minutes 48 seconds sooner, and so on for every night sooner in that proportion, your watch, &c. is right. In one month the variation from the first observation will be two hours, in three months six hours, in six months twelve hours,

hours, in nine months eighteen hours, and in twelve months twenty-four hours.

A TABLE of the Annual Revolutions, Diurnal Motions, and Distances of the Primary Planets from the Sun, &c.

	Annual Revolutions.				Diurnal Rotations.			
	D.	H.	M.	S.	D.	H.	M.	S.
☉	Has no revolution.				25	12	0	0
♃	87	23	14	34	Unknown.			
♄	224	16	41	31	0	23	20	0
♅	365	5	48	57	0	23	56	4
♆	686	22	13	19	1	0	40	0
♁	4330	8	35	4	0	9	56	0
♂	10750	13	14	4	Unknown.			
G	82 $\frac{1}{2}$ years.				Unknown.			

The Diameters of the Primary Planets, with their Distances from the Sun.

	Diameters in English miles	Distances in English miles.
☉	890,000	
♃	3,000	42,000,000
♄	7,900	49,000,000
♅	7,970	100,000,000
♆	5,400	167,000,000
♁	90,000	570,000,000
♂	70,000	97,000,000
G	797,000	189,000,000

The ♁'s diameter is 21 1/2 miles.

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The Revolutions of the Secondary Planets.

	D. H. M. S.				Dist. from the Primary. Miles.
	D.	H.	M.	S.	
1. Of the Earth's moon	27	7	43	o	240,000
2. Of Jupiter's first moon	1	18	28	36	363,600
3. Of his second ditto	3	13	18	52	580,000
4. Of his third ditto	7	3	59	40	925,000
5. Of his fourth ditto	16	18	5	6	1,630,000
6. Of Saturn's first moon	o	22	40	46	
7. Of his second ditto	1	8	53	9	
8. Of his third ditto	1	21	19	o	202,800
9. Of his fourth ditto	2	17	40	o	257,900
10. Of his fifth ditto	4	12	27	o	362,900
11. Of his sixth ditto	15	22	41	o	841,000
12. Of his seventh ditto	79	22	o	o	2,463,000
13. Of Georgium's first moon	13	11	5	1	
14. Of his second ditto	18	17	1	19	

C H A P. VII.

A short History of Comets—Of the Laws by which they are governed—Their Utility in the Universe.

COMETARY Astronomy is but in its infant state; for, their motions are so very irregular that it is very difficult to determine their revolutions with exactness, by astronomical observations.

I shall, in the first place, give a short history of Comets :

Secondly, Mention the laws by which they are governed ; and,

Thirdly, Shew their utility in the universe.

I. *Of the History of Comets.*

COMETS, called Blazing Stars, are durable bodies, composed of matter capable of undergoing prodigious degrees of heat and cold, as will hereafter be demonstrated. They have undoubtedly appeared in every age since the creation; for the ancient Egyptians and Chaldeans had some knowledge of them: But it is evident that the Ancients knew but little concerning the nature of Comets, for they were not able to trace their motions. The celebrated Sir Isaac Newton was the first mathematician that discovered the nature, philosophy, and astronomy of those luminaries.

Aristotle, and the Learned among the Greeks, were of opinion, that Comets were nothing but sublunary vapours, or airy meteors; and from hence they neglected to trace them through their intricate paths.

The Ancients supposed that the appearance of Comets were ominous of some future judgments, such as terrible thunders, lightnings, earthquakes, inundations, wars, famines, pestilences, &c.; and some among the Moderns retain that opinion to this day: However, it is exploded by the Learned.

The Comets are so very numerous, that some have supposed that more than four hundred belong to our system: But it is not really known how great their number is; and it is probable that some centuries must roll off before their number is known. Dr. Herschel informed me in October 1790, that four had made their appearance within
that

that year; but none of them had been visible to the naked eye. But though the number of Comets are so great, I have not learnt that the periods of more than three have been determined by astronomical observations. The first appeared in 1661, the second in 1680, and the third in 1757. The period of the first is 129 years, that of the second 575, and that of the third 75 only. It has been expected that the first would have been visible this year: but I have not heard of its appearing. Dr. Herschel does not suppose that either of those discovered by his telescope, was the one we have been looking for.

II. *Of the Laws by which Comets are governed.*

1. THE comets perform their revolutions round the sun in certain determinate or appointed times, like Saturn, Jupiter, Mars, &c.

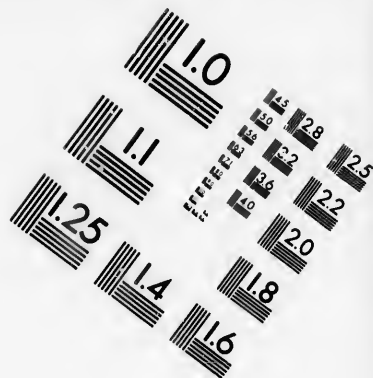
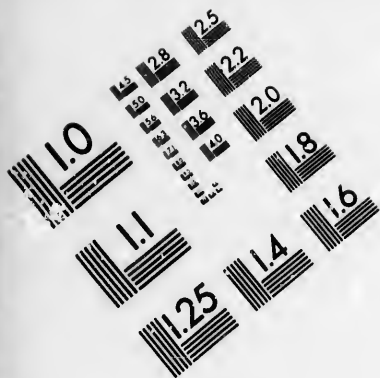
2. They are moved by a projectile force in their orbits, and a central force towards the sun, like the planets: hence their motions, in some measure, are regular and uniform; and the areas they describe round the sun, are proportioned to the times of their periods.

3. Their orbits are not right lines, nor circular, but elliptical or parabolic, much like those of the planets, only they have greater degrees of eccentricity.

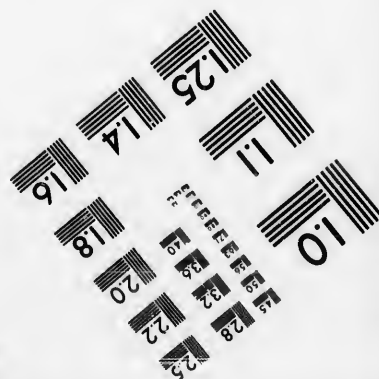
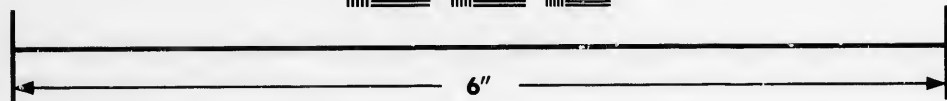
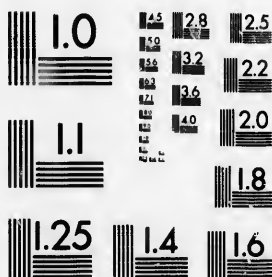
4. Some of their eccentricities are so very extensive, that the sides of their elliptic or parabolic orbits are almost converted into right lines.

5. Those comets that have the greatest eccentricities, approach the nearest to the sun at the





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times of their perihelions ; and those that have the least, are *vice versa*.

6. The comets and planets are governed by one and the same law : hence the squares of the times they spend in revolving round the sun, are always proportionate to the cubes of their greatest distance from him : hence also, the longer their orbits are, the longer will their revolutions be.

7. The motions of some comets are direct, according to the order of the signs of the zodiac ; but others run retrograde, or contrary to that order.

8. The planes of the orbits of some comets have not three degrees of elevation above the plane of the ecliptic, whilst others have almost ninety.

9. Some comets have extreme degrees of light and heat, when they are at their perihelions ; and such degrees of cold and darkness, when they are at their aphelions.

10. When they are near the sun, their motions are very swift ; but when they are at their greatest distance from him, their motions are remarkably slow.

11. The comets, like the moon, shine with a light reflected from the sun : they are environed and compressed by a large atmosphere, consisting of fine matter replete with clouds and vapours.

12. The head of a comet is the atmosphere itself, in which is a large internal body called the *Nucleus* ; it shines with the borrowed light that I have but just mentioned.

13. The

13. The tail of a comet generally arises from the *Nucleus*, and is an exhalation in the form of a fiery beam.

14. The length of the tails of some comets have been seventy or eighty millions of miles; and their breadth or thickness, thirty or forty millions more. Their tails are always turned to the parts that are opposite to the sun, because it is natural for fumes to fly from the heat, like the smoke from the fire.

15. The magnitude of some comets have been supposed to be equal to that of the earth; and the diameters of their atmospheres, near twelve times greater than that which surrounds our globe.

16. The extremities of the tails of some comets are so thin and transparent, that the fixed stars may be seen through them; but no such thing can be discovered through those parts of their tails that are near the heads of the comets, by reason of the density of their parts.

17. The comets are so very numerous, that they make the greatest part of our solar system: they may be properly called a sort of planets, because they revolve round the sun.

18. As the path of a comet appears much like a great circle of the sphere, it may easily be delineated upon the surface of a celestial globe.

19. The velocity of a comet will seem to be less than it really is, if the earth moves the same way; but if it moves contrary, it will appear greater.

20. The tails of some comets, when they are in the ascending or descending nodes, may strike across the orbit of the earth, and involve this

globe in them. The dreadful comet of 1680 was, on the 11th of November, found to be not more than the semi-diameter of the sun to the northward of this orbit.

21. The comets have an annual parallax, but not any of a diurnal kind.

22. They are capable of undergoing prodigious degrees of heat. Sir Isaac Newton demonstrated, when the comet I have but just mentioned arrived at its perihelion, which happened December 11, 1680, it was as much nearer to the centre of the sun than the earth was to the same, as 6 is to 1000; and that the sun's heat on the comet, was 2000 times greater than a red-hot iron. Hence it is evident, that the comet must retain its heat a long time afterwards: for it has been proved, that a red-hot globe, of the magnitude of our earth, would scarcely lose all its heat in 50,000 years. It is therefore probable, that the comets carry a part of their heat to their aphelions, or greatest distances from the sun.

23. The tails of comets are generated by the heat of the sun, for they have no tails at all until they come within a certain distance of that luminary; then the exhalations begin to appear, and they grow longer and longer until the comets have just passed their perihelions: afterwards, the tails grow shorter and shorter as the heat decreases, and at last they wholly disappear:—hence it is manifest, that the nearer they approach to the sun, the longer will their tails be.

24. It is probable, that in the atmospheres of the comets, there may be violent tornados, and
terrible

terrible storms of thunder, rain, hail, snow, &c. : but what damage our earth might receive by being struck by the tail of a comet, is unknown ; only, as their motions are very swift, it is reasonable to suppose that this globe and the comet would both receive a very great shock.

III. *Of the Utility of Comets.*

AS to the utility of comets, we may reasonably suppose, that the *Supreme Creator* made them not in vain, and that they are serviceable in rectifying and restoring the gradual decays of other heavenly bodies : for, as the comets pass through our system, their atmospheres are so greatly rarified and expanded by the heat of the sun, that they are scattered through all the planetary regions ; and being thus dispersed, must be, by the power of gravitation, attracted into the atmosphere of our earth and the other planets ; which undoubtedly enriches the circumambient air, repairs the decays of those globes, and promotes the generation and nutrition of the vegetable and animal productions ; laying a foundation for the preservation of the health, and prolongation of the lives, not only of the human race, but of the birds, beasts, and fishes. Eminent philosophers have supposed, that the most subtile and active particles of our air, upon which the life of things chiefly depends, is derived to us, and supplied by comets.

It has been observed, that the dark spots in the sun are only parts that have been burnt out ; and that they are nothing but a dead calx, left without
fire ;

fire; and as those spots have shined out again with great splendour, it has been supposed, that, by the central force of the comets, they are brought nearer and nearer to the sun in each revolution; that some have already fallen into him, and supplied that immense body of fire with new fuel; that from his being thus renewed and recruited, he has shined out again with a greater lustre; and that the spots that had appeared for a long time before, have thus suddenly become invisible*.

The great fixed stars are undoubtedly suns to other systems of planets and comets; and it has been supposed, that those suns do frequently lose their brightness by the emission of light and vapours; and that they are rekindled at certain times, by comets falling upon them: that by their being thus renewed, they suddenly shine again with remarkable splendour; that from hence they have been taken for new stars, as such stars have often seemed to appear, and others grow dim and disappear.

* A spot more than thrice the bigness of this earth, passed over the sun's centre, April 21, 1766, which I suppose was a Comet.

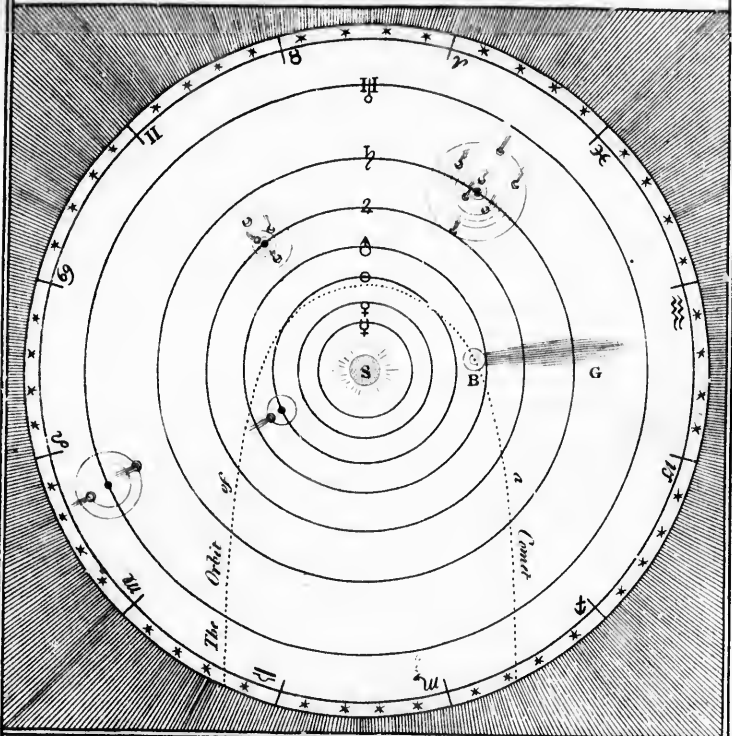
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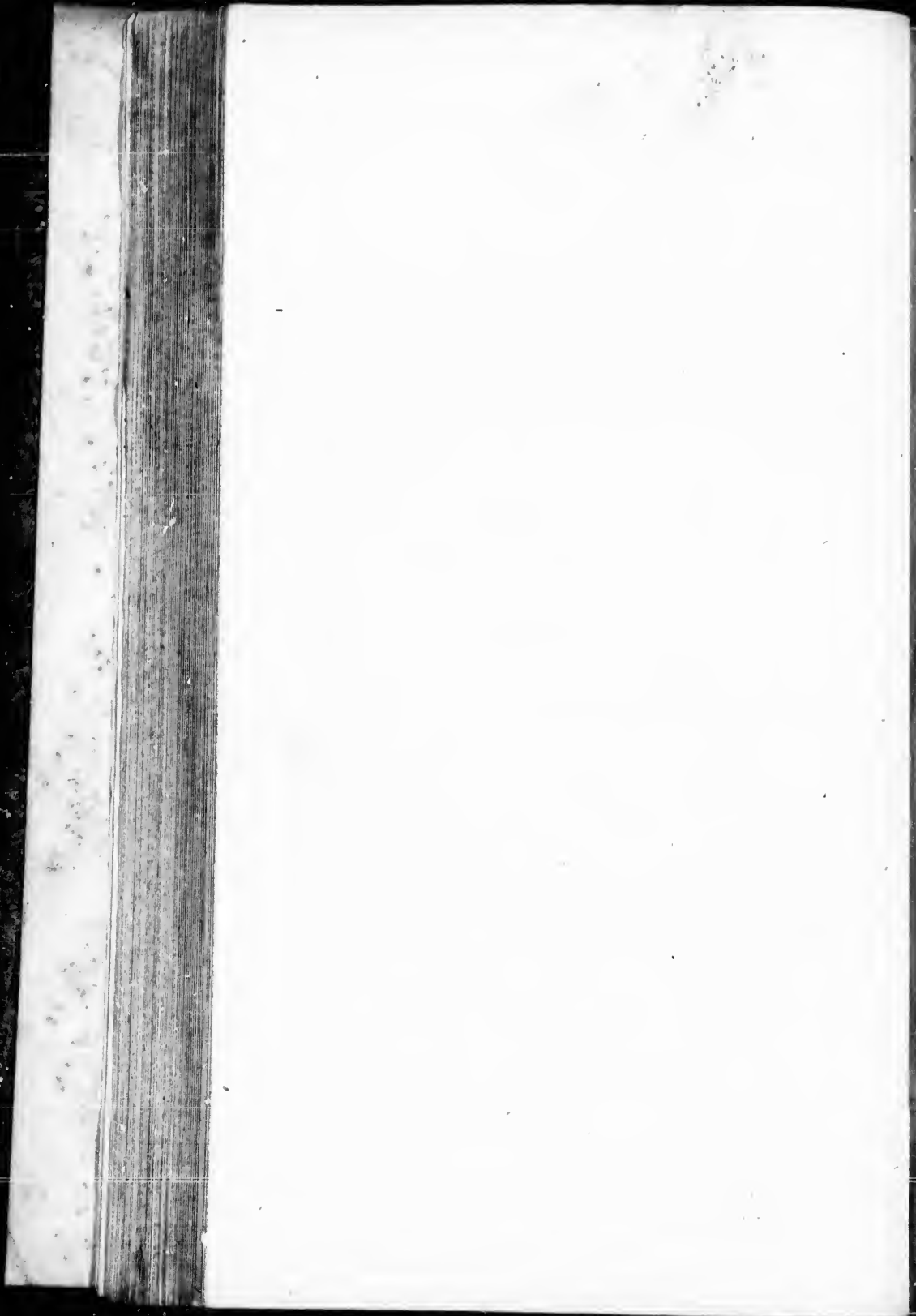
A Figure of the
SOLAR SYSTEM,
 Engraved for the AMERICAN ORACLE.
by J. Robinson. London.



EXPLANATION.

S In the Centre represents the Sun, The other Characters the Orbits of the Primary Planets. The smaller Circles the Orbits of the Moons, of Georgium Sidus, Saturn, Jupiter, & the Earth. But the Orbits of the Primaries, and Secondaries, are not drawn at proper distances for the want of room: however they will serve to give the Reader an Idea of the System. The outer most Circle represents the Sphere of the fixed Stars, & the twelve signs of the Zodiac. B. the Body, & the tail of the Comet.

I shall



I shall conclude with the following :

THE Mighty God hath all the systems made
Of worlds, and hath a solid basis laid
On which the universal fabric stands,
Obeying of his great and good commands.
I have attempted truly to describe,
How all the planets and the comets slide
In wond'rous order, as they all do run,
As they revolve around the splendid sun.
'The comets' use likewise I did relate,
How their expanded air doth circulate
'Through all the system ; how that they may fall,
And be like fuel on Sol's burning ball.
As time rolls off, the stars shall fade away,
And the glad face of sun and moon decay :
If not renew'd,—we don't pretend to doubt,
'The light in all such globes will soon go out.
Heart can't conceive, nor mortal tongue express,
Whilst we abide in this world's wilderness,
What wondrous works the Great Supreme hath laid
Within the vast expanse which he hath made.
Thus I've the works of the Great God of *Might*
In part describ'd, whose power is infinite !
Who, from this globe, will all his faints convey
To the bright regions of immortal day !

C H A P. VIII.

A Definition of ASTROLOGY—Where it is supposed it was first studied—How Astrologers pretend to tell future Events, and where stolen Goods are conveyed—Of Conjurers, Witches, Wizards, Sorcerers, Necromancers, Dreams, Visions and Apparitions—Whether the Devil knows future Events.

ASTROLOGY is an art whereby its professors pretend to tell things past, present, and to come, by the influence of the stars, their motions, and aspects to one another.

It is supposed that this art was first studied in Egypt or Babylon, and that from those countries it has been spread over the face of the globe.

This art consists of two branches, *viz.* the astronomical and the astrological. The former is the art of erecting a figure of the firmament, representing the situations of the planets for any given time, with the aspects they bear to each other; and the latter is the art of judging of the events of things by the figure erected, as that of the telling of fortunes, where stolen goods are conveyed to, &c. But as I acquainted myself with every branch of the art when I was young, and found by my own experience and observation that it is only a
deception

deception as to the telling of future events, I shall explode it as an imposition contrived by impostors to delude the ignorant, and get away their money for nothing. It is true, indeed, that an Astrologer may chance to guess right sometimes; but I am persuaded that he cannot tell when any person will be married, how long he will live, nor where things are secreted that have been carried off by thieves.

I therefore advise all Astrologers who follow the practice of imposing upon the ignorant world, to desist from their evil conduct, and all rational people not to waste their time and money in running after impostors.

As to magicians, witches, wizards, forcerers, and necromancers, it is said that they use magic or the black art, deal with familiar spirits, use enchantments, and have their assistance from the devil. It is also said, that the necromancers tell future events, by calling up dead men's ghosts, or the devil; and that the witch of Endor raised up Samuel in this manner. Many suppose that there are no witches in these times: but be that as it may, it is evident by the Scriptures that there were witches in old times; for it is said in the Mosaical Law, "Thou shalt not suffer a witch to live;" and in the New Testament, witchcraft is mentioned in the catalogue of capital abominations.

As I never acquainted myself with magic, I cannot tell how far the masters of the art can go in telling future events; but one author told me, that he did not believe that there is any devil in the

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the universe: For he said, he had been alone in a wilderness seven days and seven nights, and had spoke to no being during that time; only he summoned the devil to make his appearance—and as he did not appear, he concluded that there is no such spirit. But, by the same rule, the author might have concluded that there is no Supreme Being in the universe, if he had been summoned, and had not appeared.

A dream is the action of our imaginations when we are asleep; and there are some that are good, and others that are bad. The good consist in the revelation of the will of the Almighty, and the bad in divers vanities. Vid. *Ecclef.* v. 7.

A vision is an apparition, phantasm, or ghost, which is the spirit of a person deceased, and also a divine revelation, by a dream, or an outward voice.

An apparition is the appearing of a spirit, ghost, or vision. Hence an angel may be called an apparition; for the Almighty maketh his angels spirits, and his ministers a flame of fire. Vid. *Heb.* i. 7.

That there were dreams, visions and apparitions in ancient times, cannot be doubted by those who believe the sacred Scriptures; for the Almighty revealed his mind and will to his patriarchs, prophets and apostles, by sending his angels or spirits to them, who sometimes made a visible appearance, and delivered their messages by outward voices, dreams, &c.

The angels that gave Lot warning concerning the destruction of Sodom and Gomorrah, made an outward

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outward appearance, and delivered their meffage by an outward voice. Vid. *Gen.* xix. And the angel that warned Jofeph to depart into Egypt, appeared to him in a dream, faying, “Arife! take the young child and his mother, and flee into Egypt, &c.” Vid. *Matt.* ii. 13.

We have alfo an account in the Scriptures, of the appearance of feveral perfons after they had been dead hundreds of years; for when Chrift was tranfigured on the top of a high mountain, when his face did fhine as the fun, and his raiment became as white as the light, Peter, James and John being prefent, there appeared unto them Mofes and Elias talking with him. Vid. *Matt.* xvii. 1, 2, 3. When the angel of the Lord had liberated Peter from confinement, he went to the houfe of Mary, where thofe that were within, not believing it was Peter, faid, It is his angel. Vid. *Acts* xii. Hence it is manifelt that ghosts or fpirits appeared in thofe times, or they would not have expreffed themfelves in fuch a manner.

Moreover, we have alfo an account in the Scriptures, of the appearance of evil fpirits; for when Micaiah related his vifion concerning the deftruction of Ahab, he faw a lying fpirit, which was the devil, for he is the father of lies. Read the twenty-fecond chapter of the Firft of Kings. In the book of Job it is faid, that there was a day when the fons of God came to prefent them before the Lord, and Satan came alfo amongft them; and in the fourth chapter of Matthew, we have an account of the Devil’s coming to tempt CHRIST.

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From hence it is manifest, that both good and bad spirits have appeared in old times; and as the power of the Holy One of Israel is not limited, as he is the same yesterday, to-day, and for ever, and doth of his sovereign will and pleasure in the armies of heaven above, and amongst the inhabitants of this lower world, he can send his angels, the spirits of his saints, or those in the infernal regions, to any part of the universe, and cause them to appear to whomsoever he pleases; for all the material and immaterial beings are at his command, and all are obliged to obey his sovereign orders.

Many suppose that neither the angelical nor the diabolical spirits, nor the ghosts of persons deceased, are suffered to appear in the present age. However, it is evident by the testimonies of persons of the best credit and reputation, that apparitions have been seen of late. Of this there have been a number of recent proofs, two of which I will just mention.

A young man who had left his father in the North of England, and was off many leagues at sea, being at cards in the cabin, stopped playing all at once, and gazed with astonishment. The company asked, what he was gazing at? and he said that his father appeared to him. After his arrival in Great Britain, he found that his father died at the instant that he made his appearance. This I had from a lady of undoubted veracity, who was a near neighbour to the father and the son.

A woman with whom I was well acquainted, being on her death-bed, expressed a great desire,
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just before she expired, of seeing her only son, who was then at sea, and of delivering to him a message. She mentioned to the by-standers what she wanted to say to her son, and died immediately. She was in New-England, and her son near the West-Indies; and about the time that she died, she appeared to him standing on the shrouds of the vessel, delivered her message, walked over several barrels on the deck, then went down the side of the vessel, and appeared to be floating on the water some time, and then sunk. The young man set down the day and the hour that she appeared, and also the words she had spoken. He supposed that what he had seen was a token of his mother's death; and, on his arrival home, found that she died at the time she appeared to him, and that the words that he had written corresponded exactly with those delivered to the by-standers. He went to sea afterwards, and was drowned. Perhaps her appearing to him in that manner, was a forerunner, not only of her own, but of his death.

Apparitions may be seen by some, and not by others, which is evident by the company's not seeing the man that appeared to his son in the cabin; but though every one is not permitted to see them, it is no proof that they do not appear at all. Many that have retained the opinion for a long time that there are no such appearances, have afterwards been convinced of their error by seeing such things themselves.

Those that deny that the spirits of the invisible world have sometimes made their appearance, must affirm that the writings of the holy patriarchs,
 H prophets

prophets and apostles, and the testimonies of many good men and women, are all falsehoods, and that the Almighty is an imperfect being, that it is not in his power to cause such appearances; but such an opinion must be very absurd and ridiculous.

Besides the appearance of good angels, the spirits of some that have been dead, and Satan himself, we have an account in the Scriptures, of the appearance of the Almighty; for he appeared to Adam and Eve, to Cain, to Noah, and to others in the antediluvian world, and to Moses and others since the flood.

Although I am far from being timorous or superstitious, and believe people are often affrighted and think they see apparitions when they do not, yet I am convinced that they do sometimes appear, not only from the writings of the Scriptures, and the testimonies of persons of good repute, but from my own experience and observation, having seen not less than five in the day-time, and when I was not thinking of any such things, nor the least affrighted till they all vanished; excepting one, which I knew to be an apparition as soon as I saw it, because it was in the form of a coffin, and proved ominous of the death of a near relation: three of the others were in the forms of men, and the other in the form of a woman. I have also heard noises, which, together with the apparitions, I esteemed to be forerunners of the deaths of certain persons.

I have often been asked, whether I believed that the Devil knows future events? and my answer has been, that it is probable that he does; for when he tempted Adam and Eve in Paradise, he said,
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“ For God doth know, that in the day ye eat thereof, then your eyes shall be opened, and ye shall be as gods, knowing good and evil.” Vid. *Gen.* iii. 5.; which proved true according to the Almighty's own words, *viz.* “ And the Lord God said, Behold! the man is become as one of us, to know good and evil.” *Gen.* iii. 22.

When the witch of Endor had raised up Samuel, or the Devil in his shape, a true account was given of the things that happened afterwards. From hence we may conclude, that the Devil knows future events, though perhaps not every thing that is to happen.

To conclude, I do not see any thing in natural philosophy that is repugnant to my hypothesis concerning apparitions; and I believe it is in the power of the Great Governor of the Universe, to cause them to appear to the sons and daughters of men, and to reveal his mind and will to his children by his own Spirit, or by the spirits of his saints or angels.

C H A P. IX.

A Definition of ATHEISM, SUPERSTITION, and IDOLATRY—Of the four Religions—The Christians divided into different Sectaries—Partiality reigns too much among them—The Articles of the Mahometan Religion—When the Pagan commenced—The Heathen Gods and Goddeffes.

ATHEISM is the denying or disbelieving the Being of a God.

Superstition is an introduction of needless ceremonies into the modes of worship; the adding of things not required by the *Great Governor* of the Universe; a false and mistaken devotion.

Idolatry is the worshipping of the sun, moon, and stars; the birds, beasts and fishes; and images made by the hands of men, &c.

Some have supposed that there are no Atheists in the world; others say, that Atheism rather prevails in some parts: But be this as it may, there is a plenty of Superstition and Idolatry in many places, and I am sorry that Superstition reigns too much in Christendom.

There are but four Religions in the world, the Jewish, Christian, Mahometan, and Pagan.

The Jews adhere to the Mosaical law: The Christians, to the doctrine of Christ and his apostles:

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The Mahometans, to the tenets of Mahomet; and the Pagans worship different kinds of idols.

The Christians are divided into a great number of Sectaries, as Roman Catholics, Lutherans, Presbyterians, Baptists, Quakers, Methodists, Moravians, Sandemanians, Arians, Socinians, Arminians, Universalists, &c. many of which are too uncharitable to those not of their own persuasion. I was even taught myself, when I was young, that if I assembled with any sect to perform religious worship besides the one I was brought up with, I went on to the devil's ground. However, I soon forsook that superstitious notion, when I came to consider that the earth is the Lord's, the fulness thereof, the world, and they that dwell therein; and that the poor Devil has not one foot of land on the globe, although he offered to give all the kingdoms of the world to Christ, if he would fall down and worship him.

The Mahometan religion commenced about 622 years after the birth of Christ.

The articles of the religion are:

1. That there is but one God.
2. That Mahomet was sent by God.
3. The observation of purifications.
4. The praying at appointed times.
5. The giving of alms.
6. The fasting in the month Ramezan.
7. The going once in pilgrimage to Mecca.
8. The abstaining from spirituous liquor and gaming.
9. A man may marry four wives, and may keep concubines.

10. Every male slave who professes this religion shall have his freedom : But as it is supposed that the women have no souls, it is immaterial what persuasion they are of.

According to Chronology, the Pagan religion was first introduced by Ninus king of Assyria, 2084 years before Christ. The gods of the Heathenish nations have been very numerous; and some were called masculine, and some feminine, as will appear by the following catalogue, *viz.*

Abeona, the goddess of voyages; Adraستا, goddesses of Nemesis and Fortuna; Ægeria, a beautiful nymph worshipped by the Romans, and much by their ladies; Æolus, the god of the winds; Æsculanus, god of riches, worshipped by the Romans; Æsculapius, god of physic; Agnorina, the goddess of industry; Anatis, the goddess of prostitution among the Arminians; Angerona, the goddess of silence; Anteverta, the goddesses of women in labour; Apollo, the god of music, poetry, and the sciences; Argentinus, the god of wealth; Ate, the goddess of revenge; Averrun-cus, a god of the Romans, supposed to keep off and remove evils and misfortunes; Aurora, goddess of the morning, and mother of the stars and winds; Autumnus, the god of fruits.—Baal, an Assyrian god; Bacchus, the god of wine; Bapta, the goddesses of shame; Bellona, the goddesses of war; Britomartis, a Cretan goddess; Bubona, the goddesses of oxen.—Cabras, a god to whom salt fish was offered in sacrifice; Camæna and Carna, goddesses of infants; Canopus, an Egyptian god; Cardu, an household goddess; Cardua, a
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Romish goddesses, supposed to preside over the vital parts of mankind; Catus, a tutelar god to grown persons; Ceres, the goddess of agriculture; Cerus, the god of opportunity; Cælum, the most ancient of the heathen gods; Collina, the goddess of the hills; Comus, the goddess of laughter and jollity; Concordia, the goddess of peace among the Romans; Cunia, a goddess of new-born infants; Cupid, the son of Mars and Venus, and god of love, smiles, &c.—Dagon, a god worshipped in Canaan; Dercete, a goddess; Deverra, a goddess of breeding women; Diana Lucina, a goddess of women in labour; Discordia, the goddess of contention; Domiducus and Domitius, two nuptial gods; Dryades, nymphs or gods of the woods.—Educa, a goddess of new-born infants; Egeria, a goddess.—Fabula, the goddess of lies; Fabulinus, a god of infants; Fama, the goddess of report; Februa, a goddess of purification; Felicitas, the goddess of happiness; Feronia, the goddess of the woods; Fessonia, a goddess of wearied persons; Fidius, a goddess of treaties; Flora, the goddess of flowers and of corn; Fluviales or Potamides, goddesses of rivers; Fornax, a goddess of corn and bakers; Fortuna, the goddess of happiness and misery, said to be blind.—Gelafinus, the god of myrth and smiles.—Harpocrates, the god of silence; Hebe, goddess of youth; Hippona, the goddess of horses and stables; Hostilina, a goddess of corn; Hyale, a beautiful goddess of the woods, and one of Diana's constant attendants; Hygia, a goddess of health; Hymen, the god of marriage.—Janus, a god of new-born infants; Intercidona,

a goddess of breeding women; Jugatinus and Jupiter, perfectus, nuptial gods; Juno, the daughter of Saturn and Ops, sister and wife of Jupiter, great queen of heaven, and goddess of marriages and births; Jupiter, the son of Saturn and Ops, and supreme deity of the Pagan world; Juventa, a goddess of youths.—Lactura or Lactucina, a goddess of corn; Lares, the sons of Mercury and Lara, worshipped as household gods; Lateranus, a household god; Laverna, a goddess of thieves; Lemniades, goddesses of meadows; Levana, a goddess of new-born infants; Libitina, the goddess of funerals; Limnades, goddesses of lakes and ponds; Lubentia, the goddesses of pleasure.—Manageneta, a goddess of women in labour; Mantura, a goddess of corn; Manturna, Matuta, and Mena, nuptial goddesses; Mars, the god of war; Meditrina, a goddess of grown persons; Melicerta, a sea god; Mellona, the goddess of honey; Mercury, the son of Jupiter and Maia, messenger of the gods, inventor of letters, the god of eloquence, merchandize, and robbers; Minerva, the goddesses of wisdom, arts, and war, &c.; Mnemosyne, the goddesses of the memory; Momus, god of raillery; Morpheus, the god of dreams; Mors, the daughter of night and sleep, and goddesses of death; Muatta, or Muta, the goddesses of silence.—Nænia, the goddesses of funeral songs; Naiades, goddesses of rivers and fountains; Napææ, goddesses of groves and vallies; Natio and Nudina, goddesses of infants; Neæra, a goddess loved by Apollo; Nemesis, or Adrastæa, the goddesses of revenge; Neptune, the god of the

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the sea; Nereides, sea-goddesſes; Nox, the moſt
 ancient of all the Heathen gods; Numeria, a god-
 deſs of grown perſons; Nyctimene, a goddeſs of
 Theſſaly.—Occator, a god of harrowing; Occa-
 nus, a very old ſea god; Orbona, a goddeſs of
 grown perſons; Orcades, the nymphs of moun-
 tains; Ofiris, an idol worſhipped by the Eryp-
 tians, under the form of an ox.—Pales, the goddeſs
 of ſhepherds; Pan, a god of the ſhepherds; Par-
 tunda, a nuptial god; Patelina, a goddeſs of corn;
 Paventia and Polina, goddeſſes of infants; Pello-
 nia, a goddeſs of grown perſons; Penates, ſmall
 ſtatues, or houſehold gods; Phæcaſiani, ancient
 gods of Greece; Phorcus, a ſea god, who could
 take any form; Picumnus, a rural god; Pilum-
 nus, a god of corn and breeding women; Pitho,
 a goddeſs of eloquence; Pluto, the god of Hell;
 Plutus, god of riches, the blind, lame, and timor-
 ous; Pomona, the goddeſs of fruits and autumn;
 Priapus, god of gardens and debauchery; Pro-
 patides, goddeſſes in Cyprus; Proſa or Porrina,
 a goddeſs of women in labour; Psyche, the god-
 deſs of pleaſure.—Quies, the goddeſs of grown
 perſons.—Robigus, a god of corn; Rumina, a
 goddeſs of new born infants; Runcina, the god-
 deſs of weeding; Rucina, a rural deity.—Salus,
 the goddeſs of health; Sancus, a god of the Sa-
 bines; Sator and Sarritor, rural gods; Seia and
 Segetia, goddeſſes of corn; Senta, a goddeſs of
 married women; Somnus, the god of ſleep; Stata,
 a goddeſs of grown perſons; Statanus and Sentia,
 deities of infants; Stercutus, or Sterquilinus, the
 god of dung; Stimula and Strenua, goddeſſes
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of grown persons; Suada, a nuptial goddess; Sylvanus, a god of woods and forests; Syrinx, a nymph of Arcadia.—Tacita, a goddess of silence; Tantalus, nymph of Plota; Tereus, the nymph Bistonis; Terminus, the god of boundaries; Terror, the god of dread and fear; Themis, the daughter of heaven and earth, and goddess of justice; Thetis, the goddess of the sea; Tutelina, a goddess of corn.—Vacuna, the goddess of idle persons; Vagitanus, a god of little infants; Valonia, a goddess of vallies; Venus, the goddess of love, beauty, and marriage; Vertumnus, god of the spring; Vesta, a goddess of fire; Viales, deities of highways; Vibilia, a goddess of wanderers; Virginensis and Viriplaca, nuptial goddesses; Vitula, the goddess of mirth; Volumna, Volumnus, and Volupia, deities of grown persons; Volusia, a goddess of corn; Vulcan, the god of subterraneous fires.

Thus numerous were the idols of the Heathens; and besides those I have mentioned, some worshipped the Thunder and Lightning, with many other things too numerous to mention.

C H A P. I.

The Works of the Visible Creation demonstrate the Existence of a SUPREME BEING—From whence Superstition and Idolatry sprang—Atheistical, Superstitious, and Idolatrous People exhorted to study Philosophy.

THAT there is a *Supreme Being* of infinite wisdom and power, that created, upholds, preserves and governs the universe, is evident by the systems of worlds, the revolutions and rotations of the heavenly bodies, and the contents of our terraqueous globe; for all demonstrate his existence, omnipotence, omniscience, and omnipresence; who is justly named the King Eternal, Immortal, and Invisible, as he is King of kings, and Lord of lords, rules over all, is from everlasting to everlasting, the same yesterday, to-day, and for ever.

This infinite and incomprehensible Fountain of life and motion is an Invisible Spirit: hence the idolatrous nations have become so vain in their imaginations, that they have taken the Works of the Creator, for the Creator himself; have paid adoration to the sun, moon and stars; birds, beasts, and fishes; and to dumb idols, made of gold, silver, wood, and stone, which can neither

hear,

hear, see, feel, nor walk, as they are void of sense, life, and motion. Thus have the Heathens changed the truth of God into a lie, and worshipped and served the creature more than the *Creator*, who is blessed for ever. Amen!

Besides this vanity of worshipping the works of the Almighty instead of himself, another has prevailed in places where the knowledge of the true God has in some measure been made known. It is an introduction of a great mass of formality, superstition, ceremonies and orders into the modes of worship, which are entirely needless. This has been a great burden to the people, has tended to keep them in vassalage and slavery, and to make them have erroneous notions concerning God and the things of Religion. These impositions were undoubtedly contrived by designing men, to aggrandize themselves with worldly honours and profits.

I beseech all that are or may be of an atheistical, superstitious, or an idolatrous principle, to study Philosophy, which is the mother of all good arts, as it will teach them that there is a Creator, make them happy in this present life, and ripen them for glory in a future state. Acquaint yourselves, therefore, with this divine science. Survey the heavens and earth; contemplate upon the wonderful works of the visible creation; trace their phenomena, and investigate their laws; and you will undoubtedly be convinced, that there is a *Supreme Being* of infinite wisdom and power, that created, upholds, and governs the universe. View the systems of worlds; and consider of the distances, magnitudes, orders, and

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and motions of the heavenly bodies:—the periods of comets; the revolutions and rotations of the primary and secondary planets; their directions, stations, retrogradations, nodes, excentricities, aphelions, perihelions, heliocentric and geocentric longitudes and latitudes; right ascensions, declinations, amplitudes, altitudes, semi-diurnal and semi-nocturnal arcs; risings, fouthings, settings, aspects, conjunctions, oppositions, quadratures; eclipses, transits, and occultations:—the quantities, durations, rest and affections of the solar and lunar observations; the magnitudes of the apparent diameters of the luminaries:—the course of the penumbras; the obumbration of the terrestrial disc, and of the lunar rays; the rotation of the sun upon its axis:—the annual revolution and diurnal motion of the earth; its journey through the signs of the zodiac: the equinoxes and solstices: spring, summer, autumn, winter, day and night:—the diversities of colours, velocity of the rays of light, expulsion of darkness, generation of heat, dispersion of cold:—the moon's attraction upon the waters, at the times of her apogee and perigeon:—the spring and the neap tides; the ebbing and flowing of the sea, &c.

View the wonderful formation and contents of the terraqueous globe; its composition of earth, air, fire and water; its rocks, mines and minerals; vegetable and animal productions of trees, plants and herbs; birds, beasts and fishes; men, women and children; kingdoms, towns and cities; and the different complexions, languages, religions,

religions, customs, manners, forms of government, and systems of laws among the nations.

Behold the wondrous atmosphere, that environs and compresses the globe!—Consider of its elastic powers and mutations; of its expansion and elevation by heat, and condensation and depression by cold:—its different currents and motions; as hurricanes, tornados, trade winds, monsoons, gales, breezes, whirlwinds, &c.—how replete it is with clouds and vapours, from which are generated the rain, hail, snow, frost, dew, mist, fog, &c.—of the cause of the rainbow, mock suns, meteors, northern-lights, and other phænomena:—of the roaring of the winds, raging of the seas, and eruptions of burning volcanos:—of the various prodigies and judgments that are frequent in the world; such as, thunders, lightnings, earthquakes, inundations, wars, famines, pestilences, &c.

When you have taken an accurate survey, and seriously contemplated upon these objects, you must be convinced, that those things could not be formed, put in motion, and conducted in such a regular order and manner, without a *primary cause*, or a *Divine Artificer*, endowed with infinite power, wisdom and skill. “For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even his eternal power and godhead. The heavens declare the glory of God, and the firmament sheweth his handiwork.”

Besides the great benefits you will receive from the study of Philosophy, in being led into the knowledge

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ledge of the *Creator*; it will teach you the nature and utility of the liberal and mechanical arts and sciences, *viz.* grammar, rhetoric, logic, music, arithmetic, algebra, geometry, trigonometry, astronomy, navigation, surveying, agriculture, trade, commerce, mechanics, architecture, manufactures, magnetism, botany, chymistry, pharmacy, anatomy, physic, surgery, hydrostatics, pneumatics, optics, electricity, &c. All the discoveries and improvements in these things owe their origin to Philosophy, which is the very basis of your happiness, ease and comfort. Without this knowledge, the world would be filled with violence, and its inhabitants brought into a deplorable condition.

Wherever this excellent science has shone out in its meridian splendour, the clouds of darkness and ignorance, that overspread the minds of many, have been dispelled. Hence atheism, superstition, and idolatry, have been destroyed: the craft of false priests, witches, wizards, necromancers, conjurers, astrologers, and all those kinds of locusts discovered, and the deluded people freed from the burden of their impositions. The knowledge of the true God has thus been made known; the idols of the Heathen destroyed, the true religion discovered, proper modes of worship established, and the way to heaven and happiness made plain. In a word, Philosophy is not only the source and foundation of abundant usefulness, but of abundant profit and pleasure. It is the noblest science in which the human mind can possibly be engaged; a delightful study, attended with the most beneficial

ficial consequences to the inhabitants of the world. It teaches us to fear the Lord, which is the beginning of wisdom; and to depart away from iniquity, which is a good understanding.

By the cultivation of this divine science, the Astronomer is enabled to measure the distances, determine the magnitudes, calculate the motions, and point out the places of the heavenly bodies: the Geometrician, to determine the boundaries of continents, empires, kingdoms and states: the Navigator, to conduct his vessel, and measure his voyage to the remote parts of the globe: the Physician, to prescribe proper remedies, and cure diseases: the Apothecary, to prepare and compound natural and artificial substances for medicinal purposes: the Divine, to preach orthodox sermons; and the Lawyer, to conduct, according to the direction of the statutes, laws and ordinances of the country or place in which he resides. In fine, it enables every one, let his profession be liberal or mechanical, to transact business in the most accurate, easy, and advantageous manner.

Furthermore, I beseech you to take a further survey of the works of the *Divine Artificer*, that appear in the visible creation. Consider of the generation, formation, nutrition, growth and preservation of all the different kinds of vegetables and animals:—of the wondrous construction of the human frame; which is compounded of solids and fluids, consisting of bones, cartilages, ligaments, fibres, membranes, muscles, glands, tendons, arteries, veins, nerves, teguments, teeth, nails, &c.

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—of the chyle, blood, bile, saliva, tears, perspiration, pancreatic juice, mucous milk, sabaceous humour, cerum, gummi oculi, amygdalæ, gastric fluid, lymphæ, phlegm, spiritus animalis, &c.—of the vital, natural, and animal functions: the action of the heart, lungs, and arteries; and of the solids and fluids upon each other: the manducation of food, and the deglutition and digestion thereof, for the nourishment of the body: its muscular motions and voluntary actions, which constitute the sense of seeing, hearing, feeling, smelling, tasting, perceiving, reasoning, imagining, remembering, and judging; with all the affections of the mind. Consider, I say, seriously upon all these things, and you will undoubtedly be convinced that they did not come by chance: you will know that you are fearfully and wonderfully made; that there is a *primary cause*, a *Divine Architect*, who is the Former of your bodies, the Father of your spirits, the God in whom you live, move, and have your being:—you will no longer be like the fool, that hath said in his heart, there is no God, nor like those that follow superstition and idolatry; but be sensible that there is an infinite and an *incomprehensible Fountain of life and motion*, by whom all things were created, both in heaven and earth, whether they be visible or invisible to us in this mortal state; who requires no worship, but that which is performed in spirit and truth:—your minds will be exalted, your faculties enlarged, your ideas raised, your understandings illuminated; and you will join with the saints in celebrating

the praises of *Him*, who is the only proper *object* of religious *adoration* and *worship*; saying, "Great and marvellous are thy works, *Lord God Almighty!* just and true are thy ways, thou *King of Saints!* Who shall not fear thee, *O Lord!* and glorify thy name?"

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worship; saying,
works, Lord God
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C H A P. XI.

A Definition of Oppression, Tyranny, Sedition, Treason, Rebellion, and Persecution.—The evil Effects of those Abominations.

OPPRESSION is the laying of such heavy burthens upon the people, that they are unable to bear; and the crushing of them, by authority and violence. Thus Pharaoh oppressed the children of Israel, by putting them under task-masters, and requiring brick without straw.

Tyranny consists in a cruel, violent, and unjust government. It is the abuse of royal power, by depriving the people of their religious and civil rights, by cruelty and injustice.

Sedition is the exciting of mutinies, strifes, contentions, divisions, animosities, insurrections, mobs and riots.

Treason consists in attempting to kill a king, queen, or a prince; a levying of war against them, adhering to their enemies; the coining of bad money, and the counterfeiting of a king's great privy-seal. These things are called High Treason.

Petty Treason consists in a servant's killing his master; a woman, her husband; a secular or religious man, his prelate or superior, to whom he owes faith and obedience.

Rebellion is a wilful breaking of the laws, by disobeying the commands of the Almighty, or the good and wholesome laws of the land; a revolting from the government of a king, and the rising up in arms against a sovereign.

Persecution is an unjust or violent depriving of people of their civil and religious liberties, by scourging, fines, imprisonments, banishment, the confiscation of property, death, &c.

All these abominations ought to be suppressed, wherever they do or may exist; because they tend to destroy the felicity of mankind, and make them miserable. Wherever oppression and tyranny reigns, the progress of the cultivation and improvement of the arts and sciences is impeded, the kingdom or state is weakened, and poverty and distress must inevitably ensue. Sedition, treason, rebellion and persecution, are all productive of the same calamities, for they involve the people in vassalage and slavery.

A rebel must be a horrid monster, for he must break his oath of allegiance, and expose himself to a variety of perils and dangers: he has no rest day nor night, for he is continually afraid of being detected and brought to condign punishment; but if he succeeds in his attempts to dethrone a king or a prince, or to run off with the government of an empire, or a part of it, then those that adhere to him fall a sacrifice to his tyrannic laws; and those that have been in opposition to his evil conduct, are persecuted, because they could not in conscience follow the multitude to do evil. Has not rebellion been the
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cause of all the calamities that have happened in the universe?—Was it not a rebellion that cast the fallen angels out of Heaven, and caused them to be reserved in chains under darkness, until the dreadful coming of the great day?—Was it not a rebellion that cast Adam and Eve out of Paradise, and exposed them to all the miseries of this life, and that which is to come?—Was it not a rebellion that made Cain a fugitive and a vagabond in the earth?—Was it not a rebellion that caused the antediluvian world to be filled with violence, and brought the deluge which swept off all excepting Noah and his family, who were loyal subjects?—Was it not a rebellion that brought that shower of fire and brimstone upon Sodom and Gomorrah, which destroyed those cities? and in a word, has not rebellion been the cause of all the calamities that have beset the human race since the creation of man?

A rebel is a transgressor of the laws: therefore, all oppressors, all tyrants, all evil seducers, all traitors, and all persecutors, are rebels; because their conduct is repugnant to the commands of the Great Governor of the universe.

The conduct of a rebel is not like a rational creature, but like a roaring lion, tearing tiger, devouring wolf, and a raging bear; violence and oppression, carnage and desolation, poverty and distress, vassalage and slavery, are the things which he promotes. He carries on his abominations under a cloak of religion and liberty, disturbs people in their business, robs them of their property, and takes away the lives of the innocent.

He is a curse upon earth, a judgment to the human race, and a child of the devil. Hence indignation and wrath, tribulation and anguish, will be the reward of such workers of iniquity.

Let all rational people remember, that rebellion is an abominable sin; that it is pregnant with every evil work, and that it is like the sin of witchcraft; that it brings a train of judgments upon the human race, destroys the public tranquillity, and makes mankind miserable. Let them have no correspondence with those disturbers of the peace; but labour to suppress rebellion in all its various forms, wherever it may spring up. Let them fear God, honour the King, and those in authority; and live peaceable and quiet lives, in all godliness and honesty; for the wrath of the Lord is against them that do evil.

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C H A P. XII.

Definition of LIBERTY—All have a right to it, but some deprive themselves of that right by their own conduct, and some by the conduct of others—Of the Duty of Nations—The evil Effects of bad Constitutions—Of the French Revolution—The happy Condition of the British Empire.

AS Liberty consists in the free exercise of our religion, the enjoyment of our rights, and the profits of our labour, with the protection of our persons and properties, it is a privilege of an immense value: and as it is the natural right of every man, it is our indispensable duty to seek after it, whenever we are deprived of its benefits. But we find that many deprive themselves of liberty by their own evil conduct—by breaking the good and wholesome laws of the land, by doing things dishonourable to the Creator, and injurious to mankind. Thus thieves, robbers, murderers, &c. destroy their own freedom by their vicious behaviour; and expose themselves, not only to confinement, but to more severe punishments.

We also find, that many are deprived of liberty by the inhuman conduct of tyrants, who oppress and persecute those over whom they have usurped dominion and power, by taking from them the liberty of conscience, and loading them with burthens which they are unable to bear.

It is the duty of every nation to guard against all these evils; and from hence arises the necessity of having a good constitution and system of laws in every kingdom or state, binding upon all ranks, orders and degrees of men. Hence also arises the necessity of having kings, counsellors, governors, magistrates, and other officers appointed, for the administration of justice, and the preservation of public tranquillity.

Various constitutions and systems of laws have been framed and established amongst different nations; and where ignorance and superstition have reigned triumphant, the constitution and laws have been very deficient, so that things have been established and practised that were repugnant to the principles of justice and humanity. What numerous multitudes have been massacred for a difference of opinion in matters of religion and modes of worship! And how many thousands have worn out their days in vassalage and slavery, because laws have been made contrary to the requisitions of the great law of Reason! But whenever the minds of the people are illuminated, and the clouds of darkness, ignorance and superstition, are dispelled, the spirit of Liberty breaks forth like the sun in its meridian splendour; the constitutions are altered, oppressive laws abolished, the bands of tyranny and oppression are broken asunder, distressed objects are discharged from confinement, the liberal and mechanical arts and sciences thrive and flourish, and all enjoy those liberties which are the natural right of every man.

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The illumination of the minds of the people in France, has been productive of the great and glorious Revolution; of the forming of a new constitution, the enacting of new laws, and the abolishing of those things that were repugnant to the interest and prosperity of the kingdom. How pleasing must it be to see both the King and the National Assembly unite together in establishing the new constitution, and in promoting whatever may conduce to the good of the nation, and benefit of mankind in general! May the flame of Liberty, like the refulgent beams of the sun, be extended over the face of the whole globe; and may all nations partake of the great and glorious blessings of natural freedom!

And with pleasure we recollect, that once in the *British Empire*, the inhabitants, fired with the love of Liberty, drove ignorance, darkness, and superstition before them; made a glorious stand for their rights, and were thereby brought into a happy situation. We are now blest with a good King, with good rulers, and with a good constitution and system of laws: here a man enjoys a free toleration of religion: here he is rewarded for his labour: here he is protected in his person and property: here agriculture, navigation, trade, commerce, architecture, and the manufactories, thrive and flourish; and the nation has arrived to an inconceivable pitch of grandeur and affluence. Our constitution, being pregnant with a variety of privileges, is admired by distant nations: foreigners come from afar, and find shelter and protection, liberty and freedom, under our government.

C H A P. XIII.

The Great CONSTITUTION of LIBERTY, founded upon the Principles of Justice, and the Laws of Humanity.

EVERY constitution and system of laws ought to be constructed upon the principles of justice and humanity, which will ensure the rights of a King, and the peace, liberty, and happiness, of his subjects. I shall therefore beg leave to observe,

1. That every man has a legal right to perform religious worship according to the dictates of his conscience, at such times and places as shall be most agreeable to himself; providing he doth not injure others in their persons, characters, or properties.
2. That it is unlawful to persecute any of the human race, for a difference of opinion in matters of religion or modes of worship.
3. That public teachers are needful to instruct people in the principles of religion and morality.
4. That good rulers, both in church and state, ought to be reasonably rewarded for their services out of the public funds, and empowered to remove officers for male-conduct; and, by and with the
advice

advice and consent of the body corporate, to expel members for vicious practices.

5. That the freedom of speech, and the liberty of the press, are the natural rights of every man, providing he doth not injure himself nor others by his conversation or publications.

6. That legislative and executive officers, consisting of kings, counsellors, governors, judges, magistrates, representatives, and other rulers, are necessary to make and execute laws for the preservation of the public tranquillity in empires, kingdoms, and states.

7. That it is unlawful for rulers to make and execute laws repugnant to those of the *Great Governor* of the universe, or destructive to the peace and prosperity of the community at large.

8. That the people have a right to chuse and send delegates to represent their state and condition in a legislative assembly.

9. That a legislative body ought to consist of a mixture of monarchical, aristocratical, and democratical governments; and be divided into three branches, as that of a King, Lords, and Commons.

10. That each branch ought to have a negative voice on the other branches; and no bill ought to be passed into a law without the advice and consent of, at least, two-thirds of the members of two of the branches of the legislature.

11. The legislators ought to meet once in a year, and as much oftner as the circumstances of the nation may require, at such times and places as may be most convenient.

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12. That the people have a right to petition the legislature for a redress of grievances.

13. That every branch of an empire ought to be subject to the supreme legislative head of a nation: to render all proper honour and obedience to the King, and to all in authority, and to be subordinate to the good and wholesome laws of the land.

14. That a King ought to be considered as the first supreme legislative and executive officer in a kingdom, and to be empowered to grant pardons to criminals whenever it may be needful. He has a right to a free liberty of conscience; to protection in his person, character, and property; to rule and govern his people according to the constitution, statutes, laws and ordinances of his realm; to that honour and obedience that is due to personages in such an exalted station; and to such a revenue as his circumstances may require, and his subjects be able to raise.

15. That no man ought to be chosen into office, unless he is endowed with wisdom and knowledge, and can be well recommended for good works and pious actions.

16. That it is lawful to confer titles of honour upon, and to give rewards to such persons as may merit them by their vigorous exertions and good conduct.

17. That legislators ought to be exempted from being arrested for debt, whilst they are passing to, remain at, and are returning from the legislative assemblies, because an arrestment would impede the public service,

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18. That courts of justice ought to be estab-
lished, and justice administered to all without
respect of persons.

19. That every man ought to be allowed a trial
by jury.

20. That those under confinement ought to
know what they are confined for; who their accu-
sers are; not be compelled to bear witness against
themselves; be allowed to bring evidence, with
the benefit of counsel; and should not be con-
demned, unless found guilty by the testimony of
two or three credible witnesses.

21. That excessive bail ought never to be
demanded, excessive fines required, nor excessive
punishments inflicted.

22. That criminals under confinement ought
to have no punishment laid upon them, but that
which is requisite for the securing of their bodies;
unless, after they have been found guilty, it is
ordered by the judges, agreeable to the laws of the
land.

23. That no man ought to be imprisoned for
debt, providing he gives up his property to his
creditors, and has not wasted his time in idleness,
nor his estate by intemperance, gaming, or any
other vicious practice.

24. That persons falsely imprisoned, ought to
be immediately liberated, and to have ample satis-
faction for the injuries they have received; and
those guilty of the abomination of confining the
innocent, ought to be severely punished for their
atrocious conduct.

25. That

25. That every one who is a subject of taxation, ought to be allowed to vote for a representative, providing he is twenty-one years of age.

26. That every man ought to be taxed in proportion to his abilities.

27. That the power of levying and collecting taxes, duties, imposts, &c. with that of coining money, emitting bills of credit, borrowing money for the public use, entering into treaties and alliances with foreign powers, appointing, commissioning, and sending of ambassadors, ministers, consuls, messengers, &c. belongs to the legislature.

28. That such treaties ought to be esteemed as a part of the law of the land; kept inviolate; and whenever they are broken, restitution ought to be made to the party injured.

29. That as money is a defence as well as wisdom, a circulating medium ought to be established, consisting of gold, silver, copper, and bills of exchange. Its credit should be kept up, and but one currency established in a kingdom.

30. That churches ought to be built for the accommodation of the people when they perform religious worship; public schools, colleges, academies, and universities erected, for the promotion of literature; hospitals founded, for the reception of the sick; work-houses for the employment of idle persons; and prisons for the securing of thieves, robbers, murderers, and other felons;—and societies instituted, for the purpose of making further discoveries and improvements in the liberal and mechanical arts and sciences.

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31. That custom-houses, post-offices, and post-roads, ought to be established in every kingdom and state.

32. That weights and measures ought to be alike in every part of an empire, if not through the world.

33. That all foreigners ought to be treated with hospitality, and protected by the laws of the land.

34. That the heirs of an estate ought not to be disinherited by reason of the ill conduct of their parents; nor thrown out of their posts of honour and profit, in consequence of the unlawful behaviour of their relations.

35. That every author ought to have the benefit of his own productions, whether they be upon theological, mathematical, philosophical, physical, mechanical, or any other subject.

36. That all officers, whether ecclesiastical, civil, or military, with every other person, ought to guard against sedition, treason, rebellion, and every thing that may tend to sow discord amongst brethren, destroy the public tranquillity, and make mankind unhappy.

Thus have I framed a CONSTITUTION, which appears to me to be according to the law of reason, and the dictates of sound policy. Perhaps some things have escaped my observation, that might justly be added. However, I believe, that one calculated and established upon these principles, would secure the rights of kings, and those of their subjects, which is all that any rational person can desire.

C H A P. XIV.

Of the Impossibility of framing a Constitution that will please every-body—Anecdote of two Irishmen—The Rights of Kings, and Liberties of their Subjects, ought to be secured by a good Constitution and System of Laws.—Story of the Parson's Wig—Thoughts on the Mode of chusing Representatives—The Happiness of the People ought to be promoted.

I CANNOT expect my political sentiments will please every body, let them be ever so well founded on reason; for there are such a number of discontented mortals in the world who lust after dominion and power, and such multitudes that do not wish to be under any government at all, that should the *Angel Gabriel* frame and send a *Constitution* from *Heaven*, some would be found to murmur at it.

Many are of such a craving temper and disposition, that they would engross the whole world to themselves, and rule and govern it, were it in their power. The ambition of some men is almost boundless.—This brings to my mind an anecdote of two Irishmen, who being intoxicated with liquor at an inn, began to think that they were masters of the whole globe, and agreed to divide it equally between themselves: but as the intoxication increased,

created, one of them, who was of a very craving disposition, concluded that he had the best right to the world, and swore that he would have it all to himself; whilst the other contended, that he was justly entitled to one half of it, and wanted no more than his right. At last they settled the matter by a number of heavy blows; but whether the world was to be equally divided, or whether one was to have it all, and the other no part of it, I have forgot, although I had my information from a gentleman who was witness to this very singular contest, and knew something of our *wise* combatants.

The same temper and disposition amongst others, has prevailed too much in the world; and has sometimes broke out into such acts of violence, that kings and nobles have been deprived of their rights, and oftentimes the people at large of theirs. A monarch may crave the estates, and all the profits of the labours of his subjects: and, on the contrary, the people may crave those things that legally belong to their king; and, by acts of violence and injustice, both may lose their rights. —But, these extremes ought to be carefully guarded against; and the rights of kings, and those of their subjects, secured by a *good Constitution* and system of laws. Is it not strange that mortal men, who can abide but a very short time in this troublesome world, should be so craving as to lust after more riches, honours and profits, than they can enjoy, or that can possibly do them any good?

“ Why doth the miser all his cares employ,
 “ To gain those riches that he can't enjoy?”

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When the powers of legislation are lodged altogether in one man, and the nobles and other inhabitants of a country are shut out from having any voice in the making of laws; or when the powers are in the nobles, or in the people only, it will naturally generate a spirit of discontent amongst those who have not a share in that power. Will not a king feel very uneasy, if he has no part of the legislative power? Will not the nobles be discontented, if they have no part of it? And, will not the people murmur, if they have no share in the same? Therefore, to prevent uneasiness, and promote a spirit of union and harmony in empires, kingdoms and states, it is best, in my opinion, to have a mixture of monarchy, aristocracy and democracy in every legislative body, like the parliament of Great-Britain.

The things of this world are so mutable, that we cannot foretel what constitutions may be established hereafter. And although an astronomer can determine the revolutions and rotations of the rambling planets, and point out the directions, stations, and retrogradations of the luminaries of heaven, for thousands of years to come; yet he cannot foretel what will be done hereafter, even in his own country, or in any other part of the globe, in regard to the overturning, altering, framing, and establishing of constitutions, kingdoms, or states. It is probable that there may be alterations in these things; and perhaps the future generations may have a greater knowledge in politics than the present, and be able to frame better modes of government than the nations are in this age:

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age: for, if the knowledge of philosophy increases in the world, and the glorious sunshine of liberty and freedom breaks forth, the clouds of darkness and ignorance will be dispelled; atheism, superstition and idolatry will wear away; and the people be freed from those burthens and impositions that involve many, in the dark and benighted corners of the globe, in vassalage and slavery! It is probable they will discover that some constitutions have been deficient, and be able to correct and amend whatever has been amiss.

But many are of such a changeable temper and disposition in the present age, that they would be for ever altering a constitution that is constructed in the best manner, and continue their alterations 'till it is wholly ruined, like the *Minister's wig*; an account of which I will just relate as I received it.

A *Reverend Divine* having lost his hair in his old age, bought a large white wig to cover his naked head: But it displeased his auditors to that degree, that they had a church-meeting on the subject, and concluded that the wearing of such a large wig was idolatry; and accordingly sent a committee to their *Reverend Pastor*, to acquaint him that his congregation was much displeased, &c. He told them, that he did not wish to have any uneasiness about the wig; and if they thought it was too large, they might make it smaller; and delivered it to the committee, who laid it before the congregation, to have it altered; when one cut off a lock of hair in one place, and another in another, &c.

till the wig was utterly spoiled. At length they agreed that it was fit to be seen in the pulpit; whereupon it was returned to the owner, who said, it could not now be *idolatry* to wear the wig, for it had not the *likeness* of any thing in *Heaven* or *Earth*.—Just so it is with a constitution that is constructed in the best manner: it will not suit every one; and if it is clipped by every discontented mortal, it will be wholly ruined, *like the Reverend Divine's wig*.

There is a vanity that I have seen under the sun, and have often wondered that it has not been suppressed in this enlightened age—I mean the unjustifiable mode of chusing legislators in some parts of the globe.

When the people are called upon to chuse their representatives, a number will put up in some public place, when perhaps not more than one is to be chosen. There scaffolds must be erected, publications sent forth, mobs convened day after day, harangues delivered, and many thousands spent to induce the freeholders to chuse their delegates—when the whole of the work might be completed in half a day, by the people's assembling at the places appointed for the performance of religious worship, and carrying in their votes, in writing, to the clerk of every parish, who might easily send them to some person that might be authorised in the county to receive and count the same, and to promulgate who has the greatest number, or who the people have chosen for their legislators. Would not this mode take
up

up less time, be much easier to the people, and much more commendable, and beneficial to the community, than to have the freeholders fatigue themselves by coming a great distance, wasting their time by being kept from their employments day after day, quarrelling and wrangling about the choice of a representative? or, than to have the candidates for such places waste their estates by keeping open houses, giving away victuals, drink, ribbands, cockades, &c. till they have ruined themselves, families, and creditors?

As it is our indispensable duty to promote the happiness of mankind, I have mentioned things in the preceding chapters, which I hope will be instrumental in promoting their peace and prosperity.

In some parts of America, the people have chosen their representatives in the way that I have disapproved; and in others, in the way that I have recommended. Candidates often merit the attention of the public by their good conduct, and by publications spread abroad by their friends; and are frequently chosen into office that way, without being put to the expence of keeping open houses, and of troubling the people to assemble day after day.

C H A P. XV.

The Epistle of the AUTHOR—A Description of the Road to Liberty.

TO all people, nations, and languages, that dwell in all the world.

2. Grace, mercy, and peace be multiplied unto you.

3. It hath seemed good unto me to promulgate this *Epistle*, and to make known thereby the genuine description of the road which leads to that liberty which is destitute of licentiousness.

4. To mention those things that will make you comfortable in this life, and conduct you in the way to everlasting felicity in the realms of immortal bliss and happiness.

5. I beseech you, therefore, to remember, that atheism, superstition, idolatry, *fiction*, treason, rebellion, covetousness, theft, robbery, murder, intemperance, debauchery, bad language, gaming, idleness, and all kinds of vice, will carry you out of the road that leads to liberty, and involve you in destruction and misery.

6. Shun, therefore, all kinds of vice and immorality, and walk in the pleasant paths of piety and virtue, which will establish your freedom on a permanent basis.

7. Let

7. Let those who doubt the existence of a *Supreme Being*; and those who worship the sun, moon, or stars—the birds, beasts, or fishes—or idols made by the hands of men, contemplate upon the works of the visible creation; which will naturally convince them of their error, and excite them to pay homage and adoration to HIM, who created, upholds, and governs the universe, and is the only proper object of religious worship.

8. Avoid contentions, divisions, and animosities, which too frequently terminate in bloodshed and devastation.

9. Follow peace with all men; break not your oaths of allegiance, fulfil your obligations; fear GOD, honour the King, and those in authority; and be subordinate to the good and wholesome laws of the kingdom or state in which you reside.

10. Walk honestly; render to all their dues; pay your debts, and your proportion of the public taxes.

11. Be kind to the poor and needy, relieve the oppressed, visit the sick, bury the dead, feed the hungry, clothe the naked; and shew acts of kindness, charity, and humanity to strangers, captives, and prisoners.

12. Love yourselves, your families, and your neighbours; do good to your enemies; avenge not yourselves.

13. Be not high minded in prosperity, but patient in adversity.

14. Cultivate and improve the liberal and mechanical arts and sciences, and promote every thing that may tend to make mankind happy.

15. Be careful of your credit, your time, and your money; shun bad company, use not bad language, be not idle, waste not your estate in superfluities, be temperate and exemplary in your lives and conversations.

16. Shun the pollutions that are in the world, suppress that which is evil; do as you would be done by, and continually follow that which is good: then will ye be in the road that leads to liberty.

17. Grace, mercy, and peace be multiplied unto you all. *Amen.*

This EPISTLE of the AUTHOR, was written from *Anglia*, to the inhabitants of the world.

C H A P. XVI.

A Definition of ELECTRICITY—Who made Discoveries in the Science—How Buildings, Vessels, &c. ought to be furnished with Rods to carry off the Electrical Fluid—Of the Electrical Kite—Whether it is dangerous to wear Hair-pins, &c. in a Thunder Storm—The wonderful Effects of Lightning—Communication of Mr. Woodward—Of Animals killed by Lightning—Where it is safest to be in a Thunder Storm—The Sea an Electric Machine—What Diseases may be cured by Electricity.

ELECTRICITY is said to be an attraction without magnetism. It is the attracting and repelling of very light bodies, when the attracting body is rubbed or chafed.

The first idea of Electricity was given by Otto-guericke, A. D. 1647; and the electrical shock was first discovered at Leyden, in 1746, by Cuneus; and in 1756, it was found that it would set spirits on fire.

The electrical fluid seems to be in all bodies in a greater or a less degree. Some things will attract and conduct it, but others repel its force. Glass, hair, silk, and gums, are called electrics, or non-conductors; but metals, water, green wood, and

and most animal and vegetable substances, are non-electrics, or conductors.

Dr. Benjamin Franklin, of Philadelphia, made discoveries and improvements in Electricity. He found that an electrical kite, and pointed rods, would attract and conduct the electrical fluid. On making his discoveries known, he was made a Fellow of the Royal Society, and was afterwards honoured with a diploma from the university of Oxford in England, constituting him a Doctor of Laws.

Dr. Priestley, it is said, has also made great improvements in Electricity; and some suppose, that they are equal to those made by Doctor Franklin.

Great advantages have already been derived from those discoveries and improvements, on account of the preservation of buildings, and many people in thunder-storms. All towers, steeples, other buildings, and ships, ought to be well furnished with pointed rods, to attract and conduct the electrical fluid; though some are so superstitious as to suppose it is not lawful to try to defend those things against the violence of the lightning: but they may as well suppose that it is unlawful to brace a house, and defend it that way against the violence of the wind; for the wind and the lightning are both sent by the *Almighty*.

Small iron or steel rods, with sharp points, are said to be the best conductors. The electrical fluid will make its way to those that are the nearest, and it chuses those that are of the best kind. The rods

rods should be placed in such directions as to convey the lightning into the ground from the buildings, or into the water from vessels.

A kite sent up into a thunder cloud by a wire, having a key tied to its end, and held by a silk ribband, will attract the electric fluid from the clouds, and conduct it to the ground in a beautiful and surprizing manner.

Some suppose it is dangerous to wear hair-pins, jewels, necklaces, buckles, &c. in a thunder-storm, because those metals attract the electric fluid; but I have seen it demonstrated, where lectures have been delivered upon Experimental Philosophy, that hair-pins and other metalics may, if placed in proper directions, preserve the lives of people, by conveying the lightning from their bodies and limbs. I have been credibly informed, that a man in America had his shoe-buckles melted on his feet by a flash of lightning, and that he received no other damage.

The lightning has strange effects upon minerals, vegetables, and animals: sometimes it will melt metals, at others it will not; sometimes it sets trees, buildings, &c. on fire, at others it will not; sometimes it burns animals, at others it will not; sometimes it tears things to atoms, at others it leaves them whole; sometimes it breaks every bone in an animal to fine pieces, leaving the flesh and skin whole; at others it has no such effect; sometimes it tears their flesh to atoms, and leaves their bones found; sometimes they are killed, and no signs of a bruise can be found in their bodies

or

or limbs. When they are killed in this manner, it is supposed that their breath is taken away by the force of the lightning, as it is sometimes from others by the force of a cannon-ball, when the body appears to be unhurt.

The lightning flies in all directions : sometimes it will run in a horizontal course, cutting down large trees, &c. It often falls perpendicular, oblique, zigzag, &c. I have known it strike the ground, and then run upwards, tearing all before it. When it strikes a stick of hewed timber, it will follow the grains to where they have been cut off; then it will leave the stick, and pass on to where they have been cut off in another place; there it will enter, and tear the timber to the heart, if the grains lead to it. Of such things I have been an eye-witness.

The Hon. Bazalel Woodward, Esq. vice-president, and professor of the mathematics and natural philosophy at Dartmouth College, in the State of New Hampshire, gave me an account of a very remarkable phenomenon which happened just by his house.—Two large pine-trees, which I viewed myself, were both struck at the same instant with the lightning, at about eleven in the evening. They stood near 66 yards from each other. One of them was a dry, and the other a green tree. The lightning ran from their tops to their roots, and tore out near a quarter part of each tree, which was spread round in fine splinters. Mr. Woodward ran immediately from his bed to the other side of the room, to comfort one of his children
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that cried on being surprized at the noise of the thunder; and seeing a light shine through the window, supposed his barn was on fire. He therefore ran to the window, and, behold, the dry tree appeared to be on fire from the top to the bottom! and it emitted sparks in different directions, some horizontal, some oblique, others perpendicular; some arose to a great height above the tree, when all at once the light disappeared; and that which is very remarkable, is, that the tree was not burnt in the least in any place. He asked my opinion upon this phænomenon; and I supposed, that the tree was highly charged with electrical fluid, and that it burst through the bands of its confinement, and emitted those coruscations till the fluid was exhausted and dispersed in the atmosphere without setting the tree on fire.

Animals killed with lightning swell to an enormous size. An ox killed that way, was found standing on his legs the next day, much swelled. A man was killed in one church, and a woman in another, sitting in an erect posture, and remained so after they were dead. I have had the care of three patients that lived at a great distance from each other, who were struck with the lightning. The first was thrown into hysteric fits, the second considerably burnt, and the third was struck with numbness: but they all recovered. Thus rapid is the force, wondrous the operation, and dreadful the effects of this subtile electric fluid.

It is supposed to be safer to sit in the middle of a large room during a thunder-storm, than it is to
be

be near the sides, or in a small apartment, because the lightning frequently runs on the sides of a building. The windows ought to be shut; for, a person standing with his cloaths dry, in the open air, in a room, under a shed or a tree, will be in great danger of attracting the electrical fluid: but he is not in so much danger if his cloaths are wet, because the water is a conductor.

The earth and waters are full of the electric matter, as well as the atmosphere; and it is supposed that there is enough in the sea to consume it, were it put in motion. As water is a conductor, and salt a non-conductor, the sea may be called a huge electrical machine; for when it is agitated by the wind, it collects fire on its surface from beneath: hence it appears in the night as though it was on fire. A cloud, therefore, raised from a rough sea, contains more electric fire than one raised from the land or a calm sea. Hence, if two such clouds meet, that which is the highest charged will discharge itself into the other by a flash of lightning, which will restore the equilibrium. This fire clearing the air, the adjoining air will rush in with a report called thunder. If a cloud highly charged, is attracted by a mountain, tower, steeple, house, or tree charged in a less degree, it will discharge its contents, tearing whatever obstructs its force: hence appears the need of wires to attract and convey the fluid.

I have neither time nor room to give any long history of Electricity, nor even a description of the electrical machines and experiments that I have seen

seen where I have attended lectures upon Experimental Philosophy; shall therefore only observe, that a spectator would be surprized; were he to attend such lectures, at the wonderful discoveries and improvements that have been made in this science in the present age.

Electricity is said to be beneficial in agues, St. Anthony's fire, loss of sight from a *gutta serena* and other causes, extravasated blood, bronchocele, chlorosis, coldness of the feet, consumptions, contractions of the limbs, cramp, deafness, dropsy, epilepsy, *fistula lachrymalis*, ganglions, gout, gravel, headach, hysterics, inflammations, king's evil, leprosy, mortifications, palsy, peripneumony, pleurisy, rheumatisms, ringworms, scalds, *sciatica*, shingles, sprains, surfeits, toothach, tumours, and St. Vitus's dance.

But it is hurtful when the pulse run high, and also to pregnant and suckling women, and to unborn children. It is very prejudicial in all venereal cases, because it increases the *momentum* of the blood.

In intermitting cases, the patient should be electrified when the pulse are at the lowest; and none ought to apply this remedy without the advice of a skilful physician, because it may convey a disorder to every part of the human body, and do much damage thereby.

When the pulse are higher than in a state of perfect health, electricity must be entirely omitted: but when the body is in a proper condition, diseases may be cured by the electrical fluid, when other remedies fail.

C H A P. XVII.

Of the Cause of THUNDER, LIGHTNING, EARTHQUAKES, and INUNDATIONS—A Table of remarkable Earthquakes, and the Places and People that have been swallowed up.

AS Thunder is only the report of the Lightning, it is needless to say much upon that subject: What we have to do, is to point out the cause of the Lightning.

In the preceding chapter we mentioned, that “when two clouds meet, that which is the most highly charged with the electrical fluid, will discharge itself into the other by a flash of lightning, which restores an equilibrium. This clearing the air, the adjoining air rushes in with a report called Thunder.” Let us now observe, that the Lightning is produced by sulphureous steams exhaled by the heat of the sun, and the nitrous acids or salts floating in the air, which, combining together, generate heat by fermentation; and the violent action and great rapidity of the motion of the different currents of air upon the combustible composition, makes it take fire, and cause those dreadful explosions we call thunder-claps.

Hence,

Hence, then, the heat or fire must proceed from the antiperistasis which exist between the particles, and their friction, or rubbing against one another. We find, that *Aqua Fortis*, and the filings of copper, will generate heat; that the oil of caraway-feed, poured on the compound spirits of nitre, will kindle immediately into a flame, and cause a prodigious explosion; and that the flowers of sulphur, mixed with an equal quantity of the filings of iron, will produce a blast. Hence, if twenty pounds of each are mixed into a firm paste with a little water, and the composition is buried four or five feet under ground, in six or seven hours the earth will tremble, crack, smoke, open her mouth, and vomit flames of fire. A large quantity of such matter would make a burning volcano; if it should burst under the sea, it would produce a water-spout; if in the clouds, thunder and lightning. This is called an Artificial Earthquake, &c.

I have heard thirteen Earthquakes in America, and have observed, that the sound of some resembled the noise of thunder; some, the roaring of wind; some, the running of water; and some, the burning of fire. Hence I concluded, that there are different kinds of Earthquakes, produced from various causes. Those that I have felt, all happened in fair weather, and when the wind did not blow: excepting one, which made a noise like heavy thunder at a distance; the shock was violent, and the weather very windy and rainy.

They commonly happen in calm, warm, dry, sultry, or frosty seasons, and are felt both at land

and sea. Some are confined to narrow limits ; others are extended to many countries. Some are gentle in their motions ; others are violent, laying all in ruins. A hollow rumbling noise rolling in the air, like the roaring of a cannon, precedes the shock. They are felt more in high places than in those that are low, and have a greater effect upon stone and other solid buildings than those of slighter materials. Great towns and cities, situated on seas, bays, rivers, or burning mountains, are the most subject to Earthquakes. They cause the water in wells to become foul ; and sometimes they shut up some springs, and open others. Sometimes they swallow up mountains, islands, towns and cities ; affrighten and destroy the birds, beasts, and fishes ; men, women, and children. Sometimes the sea roars, and rises into billows ; and the earth opens her mouth, and vomits flames of fire, with great quantities of water, sand, stones, sulphur, &c. The atmosphere is turned red : new mountains and islands are thrown up : the rocks are split to pieces ; some canals of water are filled with earth, whilst new ones are opened. Sometimes the bells in churches ring ; the tops of steeples and chimneys are shaken down ; the beasts of the field, and the fowls of the air, cry out ; whilst the inhabitants of the earth are filled with lamentation. These are the works of the Almighty ! He looketh on the earth, and it trembleth ; He toucheth the hills, and they smoke.

It is said, that Earthquakes have produced pains in the head, back and joints, rheumatisms, vertigos, hysteric complaints, and other nervous disorders,

ders, arising perhaps from sulphureous and other disagreeable effluvia that issues out of the earth, and the frightful appearance of things.

Philosophers have accounted various ways for the causes of these dreadful phenomena; as,

1. From subterraneous cavities, vaults and canals in the bowels of the earth, some of which are filled with wind, some with water, and some with liquid fires.

2. From sulphur, bitumen, salts, amber, minerals, &c. deposited in the globe; which, being of an inflammable nature, generate exhalations by fermentation or other causes.

3. The motion of the wind and water in the subterraneous caverns and canals, may drive the rocks, mines and minerals together with such a rapidity as to cause them to emit sparks that may set fire to the sulphureous, nitrous, and other inflammable steams that are of a combustible nature, which, wanting vent, produces eruptions, and all the violent and dreadful effects that are frequent in Earthquakes.

4. From subterraneous clouds bursting out into lightning.

5. The falling-in of arches weakened by continual subterraneous fires.

6. The bursting out of rarefied steams of water.

7. The ignition of inflammable exhalations.

8. The violence of the electrical fluid.

In some places, the combustible matter may find vent without producing any direful effects; but when the ground is tightly condensed, the inflam-

nable matter will burst open the gates of its confinement, the sides of the subterraneous caverns will fall together, and down will go mountains, islands, towns and cities, if they are situated upon such places; and where there are waters contained in such subterraneous apartments, they will ascend, and overwhelm the parts where the mountains, &c. have been swallowed up. Hence, new lakes, new rivers, new ponds, &c. are made on the surface of the globe.

When new mountains and islands are thrown up by the combustible matter, a sufficient quantity of earth and water rushes under them, to support them from sinking, otherwise they would naturally subside.

About the year 1749, Dr. Stukeley invented a new hypothesis concerning the cause of Earthquakes, which is what is already mentioned, *viz.* the violence of the electrical fluid. He supposed that the earth is sometimes so overcharged with it, that it breaks out into the atmosphere, and causes all the dreadful phenomena; that when the earth is highly charged, the touch of a non-electric body, such as a cloud not charged with the electrical fluid, will produce an earthquake; and also, that one may be produced from a cloud more highly charged than the earth, if it empties its contents on the globe.

Let us therefore observe, that when the electrical fluid in the earth and atmosphere is in a perfect equilibrium, there can be no earthquake, if this fluid is the cause of those commotions; that when
such

such convulsions happen, as soon as the terrestrial and atmospherical electric fluid is equally dispersed, the Earthquakes cease, and all things are at rest.

It is my opinion, that Earthquakes are produced from various causes; but that they most frequently happen from the generation of heat, by the fermentation of beds of sulphur combined with divers kinds of minerals; that the heat increases until the combustible matter takes fire, and produces those dreadful explosions, which are sometimes so violent as to cause the earth to open her mouth, vomit flames of fire, torrents of water, wind, sand, rocks, &c. and to swallow up mountains, islands, towns, and cities.

“ In deepest caves are beds of sulphur made,
And in a secret fearful ambush laid;
When God's avenging hand shall touch the train,
Some warn'd devoted city quick is slain.
The earth 's convuls'd, her jaws are open'd wide;
Churches with all their lofty spires subside;
To Nature's womb they sink with dreadful throes,
And on poor screaming souls the clasms close!”

I shall conclude this Chapter by the addition of the subsequent Table of Remarkable Earthquakes and Inundations:

EARTHQUAKES.

	A. D.
TWELVE cities overturned in Asia	17
Nicomedia, and several neighbouring cities, swallowed up	120
One hundred and fifty cities swallowed up in Macedonia	357
Fifty thousand persons destroyed by an earth- quake and an inundation in Alexandria	365
	Several

	A. D.
Several cities swallowed up in Europe	394
Several cities swallowed up near Cybyra	417
Several cities swallowed up in Palestine	419
The walls of Constantinople and 17 towers overthrown - - -	446
The city of Antioch almost destroyed -	458
One at Constantinople, that lasted 40 days, and overturned several edifices -	480
Several cities destroyed near Antioch -	526
Four thousand eight hundred people swal- lowed up at Antioch -	528
One at Constantinople -	552
Many houses overthrown at Rome and Con- stantinople - - -	557
France, Germany and Italy shaken, and St. Paul's thrown down at Rome -	801
One through all England -	1090
One at Shropshire -	1110
One at ditto - -	1116
One at ditto - -	1120
One at ditto, when flames of fire issued out of the earth - -	1134
The city of Catania, and above 15,000 peo- ple, swallowed up -	1137
One that overthrew a church at Lincoln, and some others -	1185
A dreadful one in - -	1228
One in Shropshire - -	1249
One at St. Albans -	1250
A general one, that threw down St. Mi- chael's near Glastonbury -	1274
The greatest in England -	1328
	Several

REMARKABLE EARTHQUAKES.

151

A. D.		A. D.
	Several churches thrown down -	1382
394	A very dreadful one -	1426
417	Another -	1661
419	Fifty-four towns and cities, with 60,000 people, swallowed up in Sicily	1691
446	Port-Royal in Jamaica swallowed up	1693
458	Sixty thousand persons destroyed in Sicily	1693
	Near 400,000 people destroyed in China	1699
480	Peru laid waste by an earthquake, 300 leagues in length, and 90 in breadth	1700
526	An earthquake at Rome -	1703
528	One at China -	1718
552	The kingdom of Chili destroyed -	1730
	Four provinces destroyed in China -	1731
557	One at Naples -	1732
	Two thousand souls, 100 houses, and five churches, destroyed in Ireland	1734
801	Lima and Callao, with about 3,000 people, swallowed up in Peru -	1746
1090	Two in London -	1750
1110	Four thousand persons destroyed at Philipoli in Romania -	1750
1116	Two hundred mosques, and a great part of the city of Alexandria, destroyed	1752
1120	Many villages swallowed up in Morea	1754
1134	Forty thousand people destroyed at Constan- tinople and Grand Cairo -	1754
1137	Two thousand houses destroyed in the Island of Metylene -	1755
1185	Quito in Peru destroyed -	1755
1228	Lisbon, and 70,000 inhabitants, destroyed	1755
1249	Four earthquakes in North-America	1755
1250		One
1274		
1328		
everal		

	A. D.
One at Azores	1757
One at Tripoli	1759
A terrible one in Syria	1760
Eight hundred and eighty persons buried in an earthquake at Constantinople	1766
One thousand six hundred people destroyed at Martinico	1767
One at Altdorf in Switzerland	1774
The city of Gualtimala, and 8,000 families, swallowed up	1774
A dreadful one at Smyrna	1778
Thirty thousand people, and the city of Mel- sina, swallowed up	1783
Two earthquakes in North-America	1783
Part of Oran in Africa destroyed	1790
Two earthquakes at Cherburg, on the coast of France, which destroyed many houses and people	1791

The Author is sorry he is not able to give a fuller account of the numerous Earthquakes that have happened in America: though he has heard thirteen, he has forgot the particular times when some of them happened. As he is now in London, and at a great distance from America, where his records are, he is incapable of giving a further account at present: however, he expects to be able to do it in some future edition of the *American Oracle*. Jan. 17, 1791.

Of the Cause of INUNDATIONS.

INUNDATIONS are sometimes caused by Earthquakes, and sometimes by violent storms, which makes the sea rise so high as to overwhelm the land. When storms are the cause, the water rises higher at the times of the spring-tides, than it does at other times. We have no account of a general deluge, excepting that of Noah's flood.

Inundations are frequent in low lands in America, situated near the sea; but I have not heard that many lives have been lost, neither have I understood that many have been lost in Great-Britain, Ireland, or France: Though at Newcastle upon the Tyne, about 120 persons lost their lives by an inundation, in 1446—100,000 people were drowned at Dort, in Holland, 1568—72 villages were overflowed in Zealand, and above 20,000 people perished, in 1717—1300 were drowned in the same country, and there was a dreadful inundation at Peterburgh, in 1777.

Since I wrote the preceding, I have received the following account, *viz.*—That a terrible Earthquake began on the 5th of February 1663, and raged through all Canada till July following, almost every day or night, for a quarter or half an hour at a time. Its effects were horrible; as the mountains clashed together, and some tumbled partly into the river St. Lawrence, and were partly removed to vast distances, with their trees standing upon them.

C H A P.

C H A P. XVIII.

*Of the Number and Cause of Burning Mountains—
Their terrible Eruptions—What makes Hot Springs.*

IN Europe, there are three noted Volcano's, viz. Mount Ætna in Sicily, Hecla in Iceland, and Vesuvius near Naples in Italy.

In Asia, there are Mount Albours; one on the Island of Ternale, some among the Molucca Islands, one on one of the Mauritian Islands, one on the Island of Sorca, several in Japan, and a number more in the neighbouring Isles;—there are also several in the Philippine Islands;—one in the Island of Java, Mount Gounapi in the Island of Barida:—and there are others in the Indies, as in Sumatra, and the Northern parts of Asia.

In Africa, there is Mount Beni-guazeval, near Fez;—Mount Fugo, on one of the Cape de Verd Islands;—and the Pike of Teneriffe, in the Canaries.

In America, there are a great number of burning mountains. In Peru, there is Mount Arequipa, Mount Carapa, Mount Malahallo, and many more.

In Mexico, Mount Popochampeche, and Mount Popocatepax. There are also some in the West-India Islands. It is said, that there are upwards
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of sixty burning mountains in the world; but those whose names I have mentioned, are the most remarkable; and their eruptions frequently cause earthquakes.

Burning Mountains are caused by beds of sulphur, bitumen, minerals, pyrites, &c. deposited in the bowels of the earth, which are capable of generating heat by fermentation. These taking fire, produce explosions in proportion to the quantity of inflammable substances. Sometimes they are more violent than those of gunpowder or thunder; have astonished, terrified, and destroyed mankind, and desolated the earth around them. A Volcano may be called a terrestrial cannon, whose mouth is often more than a mile and an half in circumference, out of which is vomited torrents of smoke and flames, rivers of sulphur, bitumen, melted metal, clouds of ashes and stones, enormous masses of rocks and calcined vitrified substances, which bury towns and forests, cover the country a hundred or two hundred feet deep, and form new hills and mountains. The action of the fire is so vehement, and the force of the explosion so powerful, as to shake the earth, agitate the sea, overthrow mountains, and destroy cities, at a very considerable distance.

Some have supposed, that these torrents of liquid fires proceed from the very centre of the globe, and that they come from Hell. The inhabitants of Iceland have believed, that the roaring of their Volcano was the cries of the damned in the infernal regions, and that its eruptions proceeded from the fury and despair of those confined

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in that horrible pit. Their astonishment begets fear, and their fear generates superstition. Some suppose that those fires do not reach many miles below the surface of the globe: however, it is probable that some of them run very deep, or they could not vomit such vast quantities of matter. Some mountains that have been on fire are gone out, according to the accounts given of them by historians: it is probable that all the fuel that was in them has been consumed.

New Volcanos have burst out; perhaps some have been set on fire by fermentation, and some by lightning from the clouds.

It is not known when Mount *Ætna* first took fire; but by digging 68 feet into the ground, marble pavements, and other ruins of an ancient city, have been found. The smoke and flames of this Volcano have been seen at the distance of 60 leagues. In 1650 and 1659, new fiery mouths did burst out through this mountain, and they have also burst out at other times. An eruption in 1537, caused an earthquake through all Sicily, that continued 12 days, and overthrew a great number of houses and edifices. The earthquake ceased on the opening of a new mouth, which vomited a torrent of fire, that burnt up every thing within five leagues of the mountain. Great quantities of ashes were thrown out, some of which were carried to Italy; and ships at a great distance from the Sicilian shore, were incommoded with them. Stones have been thrown out of this mountain, to the distance of 60,000 paces. One

of

of the eruptions, in 1693, destroyed upwards of 60,000 people, as we observed before.

Mount Hecla vomits its fires through ice, snow, and a frozen soil, with as great a violence as Mount *Ætna*. It throws out vast quantities of ashes, pumice stones, and sometimes boiling water. There is no living within six leagues of this Volcano.

Mount Vesuvius buried the city of *Heraclea* 60 feet deep under the matter thrown out in one of the eruptions. In 1737, there was such a dreadful eruption, that a large torrent of red-hot melted metalline substance was vomited through several mouths, which overspread the country, and ran to the sea, which was six or seven miles from its source. The breadth of this torrent was about 50 or 60 paces, and its depth about 6 or 7 feet.

In 1693, a burning mountain on the island of *Sorca* in *Asia*, vomited bitumen, and other inflammable substances, in so great a quantity as to form a burning lake, which extended till it covered the whole island. There have also been terrible eruptions in other parts of *Asia*, where the burning mountains are situated.

The Volcano in the top of *Teneriffe* in *Africa*, frequently causes earthquakes. In 1704, an eruption of sulphur and melted ore ran down like a river, destroyed several towns, and converted the richest land in the island into a barren desert. Other burning mountains in *Africa* have their eruptions, and cause earthquakes, and so do those in *America*.

I shall conclude this Chapter by just mentioning the cause of *Hot Springs*.

As there are subterraneous veins of liquid fires in the bowels of the earth, some of the waters in those springs may be heated that way ; and others may be heated by passing over beds of minerals, that generate heat by fermentation :— but more of this, when I come to treat of the virtues of the mineral waters.

CH A.

C H A P. XIX.

How the AUTHOR came to form a new Hypothesis concerning the Cause of the AURORA BOREALIS—What his opinion is—Why those Lights did not appear in former Ages—His Hypothesis versified.

IN the evening of the 26th of January 1788, as I was sitting in a large room in the State of Vermont, the weather being very severe, a cat jumped into my lap, whose hairs were stiffened with the cold; and, as I stroked them, I observed that they emitted coruscations, and began to conclude that they were the electrical fluid. In a few minutes I turned my attention to the cause of the Northern Lights. Said I, why may not the atmosphere emit coruscations as well as the hairs of the cat, if it is properly stiffened with the cold, and agitated by the different currents of air? I therefore formed a new *hypothesis* concerning the cause of the *Aurora Borealis*; and supposed, that those phænomena are generated by aqueous, nitrous, sulphureous, bitumenous, and other exhalations from the fumes of various kinds of waters, earths, minerals, vegetables, animals, fires, burning volcanos, &c.; which being charged with a sufficient quantity of the electrical fluid, and rarefied by the heat of the sun,

sun, become lighter than the surrounding atmosphere : that from hence they ascend, until they are elevated to the upper regions of the air ; and being driven by the wind from the equatorial and temperate to the polar regions, meet with the cold, combine and stiffen to a proper consistence by reason of their humidity ; and, being afterwards agitated by different currents of air, crackle and sparkle, like the hairs of cats and other animals when stiffened with the cold ; which coruscation in the temperate and frigid zones, appears in the horizon, zenith, or elsewhere, according to the positions of the spectators, and the elevated exhalations : that the diversities of the colours arise from the difference of the qualities of the combined particles, as those which are of the most inflammable nature shine with the greatest lustre.

That the Northern Lights did not appear in ancient times, because the air was not impregnated with proper materials to generate those phenomena ; that the consuming of great quantities of fuel in America in these latter ages, the breaking out of burning mountains, and the visitation of our system by blazing stars, whose atmospheres have been so greatly expanded by the heat of the sun ; that a part of them have fell into the atmosphere of our earth, and charged it with new matter ; that from this, and the other fumigations, the air has undergone such a change, that whenever it is brought into a proper consistence, the *Aurora Borealis* makes its appearance, unless it becomes invisible by the rays of the sun or moon.

That

That the rays of the Northern Lights rise much higher than the combined particles from whence the lights proceed ; which is manifest by the rays of a candle being extended to the sides of a room, the light of a fire to the clouds, and that of the sun to this globe.

Sometimes I have heard the combined particles crackle, when they have been agitated by the wind : their noise resembled, in some measure, that of a loose sail flapped in a gale of wind.

The hemisphere is often illuminated till it is as light as bright moon-shine ; the particles move in different directions, and appear in different forms : they frequently send forth streamers, which dance like lucid pillars ; and about two or three times I have seen them appear like armies fighting against each other.

The hemisphere is sometimes as red as a fiery oven ; but in general these phænomena are more brilliant, and the lights are more bright and frequent, in the temperate and frigid zones, than they are in the torrid.

These lights do not go out immediately, like a flash of lightning, but often continue some hours. This appears mysterious : but the humidity of the particles undoubtedly causes them to combine immediately after they are agitated by the wind ; but when the humidity is destroyed, the combination ceases, and of course the phænomena.

Some have imputed the cause of the *Aurora Borealis* to the electrical fluid, and I am confident that it is that fluid that produces those lights ; but the question is, What puts it in motion, and

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makes

makes it break through the bands of its confinement, if it is not the frictions produced by the wind?

Thus have I mentioned the hypothesis I formed:—It has been published through America; and since my arrival in England, it has been promulgated here. I have not heard that any person ever wrote against it: and if I am in the dark, I shall rejoice in being enlightened; as it is the truth I aim to find, and publish to the world for the benefit of mankind.

I shall conclude this chapter with the following lines, *viz.*

IN seventeen hundred eighty-eight, I sat
 In a large room, with a good natur'd *Cat* :
 She soon jump'd up, and stood upon my knees ;
 I strok'd her back, which did her not displease.
 As she purr'd round, and grew exceeding bold,
 I found her hairs were stiff'ned with the cold :
 When I strok'd them—behold, the sparks did fly !
 Like flaming lightning through the azure sky.
 From what, said I, from what can this proceed ?
 Must not this be electric heat indeed ?
 Is it not strange, that it doth break its bands !
 When the cat's hairs are stroked by my hands ?
 Whilst in my studies I did thus proceed,
 I form'd a new *hypothesis* indeed !
 I turn'd my thoughts upon that gloomy night,
 Unto the cause of the great northern light :
 May not, said I, the vapours here and there
 Emit such coruscations in the air,
 When they into a proper state are roll'd,
 Condens'd and stiff'ned by the freezing cold,
 And agitated by the lofty sails
 Of breezy currents, or of gentle gales ?

Sol's heat, said I, most rapidly exhales
 Fumes from the mountains and the deepest vales ;
 From earths and waters, mines and sulphurs all,
 From plants and herbs, from trees both low and tall ;
 From creeping things of diff'rent kinds of names,
 From burning hills, and all the fiery flames ;
 From nitrous salts, and other things that be
 Found on the land and the great wat'ry sea.
 By the Sun's heat, these fumes are much enlarg'd ;
 And, being with electric matter charg'd,
 Become more light, it cannot be deny'd,
 Than the surrounding air on ev'ry side.
 Hence they ascend, and elevated are
 Unto the regions of the upper air ;
 And being driven by the wind that rolls
 From the equator onward to the polls,
 Meet with the cold—their humid parts from thence
 Combine with others, and become more dense.
 The composition, shaken by the means
 Of windy currents called airy streams,
 Emit fine sparks, as I've already told,
 Like the cat's hairs, when stiff'ned by the cold ;
 Which conflagrations in the zones appear
 Sometimes to draw towards us very near :
 Sometimes they're high, and then again they're found
 Descending gently to the solid ground ;
 Illuminating, in the silent night,
 The hemisphere with a refulgent light !
 These northern lights, as I have oft been told,
 Were never known within the days of old ;
 But now, behold ! they're often seen to dance
 In Britain, Holland, Germany, and France !
 Nay to and fro they by the winds are hurl'd,
 'Till they appear in most parts of the world.
 In divers forms within the changing year,
 Those floating exhalations oft appear :
 Sometimes they do like lofty pillars rise,
 And shoot their streams towards the higher skies ;
 Sometimes they dance about like fiery falls,
 Sometimes they look like clouds—like comets tails ;

Sometimes like armies fighting in the air !
 But this phenomenon is something rare !
 Sometimes they're red, and then again they're white ;
 Sometimes they shine with a refulgent light !
 Sometimes they crack, and rapidly the sound
 Extends itself down to the solid ground :
 Sometimes their motion, ev'ry one doth know,
 Is very swift, and then again 'tis slow.
 May we not now with reason here suppose,
 That these diversities of colours rose
 From particles which in the air exist,
 And do of different qualities consist ?
 That those which were of the most flaming kind,
 Have always with the greatest lustre shin'd ?

In later times, a change without all doubt
 Within the atmosphere was brought about ;
 Which is the reason why the light appears
 To us so frequent in these modern years,
 And why it did not in the former age
 Appear to those that then were on the stage.
 Perhaps the earth some time hath drawn a share
 Of rambling comets' atmospheric air :
 For, as they pass in their elliptic course
 Through this great system with a rapid force,
 Sol's burning heat their atmospheres expand,
 'Till part of them into the earth's do land ;
 Her great attraction causing them to fall,
 And change the air that doth surround her ball.

Some burning mountains, too, without all doubt,
 Have on this globe in modern times burst out ;
 Whose fumes have charg'd the circumambient air
 With new expanded matter every-where.

The air also might change in some degrees,
 By the consumption of the num'rous trees,
 And other fuel, in these modern times,
 Burnt by the people in the western climes.
 The air thus chang'd, its particles combine,
 And wond'rous lights now frequently do shine ;
 Some red, some white, some crimson, pale, and blue ;
 Some shining bright, some with a greyish hue :

But oft they're hid by Sol's refulgent light,
 And the Moon's rays within the silent night.
 The northern lights ascend more high, indeed,
 Than the great mafs from whence they do proceed ;
 Illuminating, as they do arife,
 The hemisphere, towards the upper skies.
 To tell the truth, it is my candid mind,
 That the electric matter lies confin'd
 Within the vapours stiff'ned in the air,
 Until an agitation makes them rare :
 Then the electric fluid breaks its bands,
 As from stiff hairs when stroked by our hands ;
 Through its confinement truly it doth burft,
 Something like lightning in a thunder gult.
 If you shou'd ask, what makes this fiery train
 In the wide hemisphere so long remain ?
 Why in an instant it doth not go out,
 Like flaming lightnings hurling round about ?
 I shou'd the mystery thus to you unfold :
 The particles keep stiff'ned with the cold ;
 Although expanded by a gentle breeze,
 Yet in an instant they again do freeze.
 Thus they go on from time to time to shine ;
 At last they're broke so that they can't combine :
 Then in the air, behold, they take a flight !
 And the phenomenon goes out of sight.

Thus I've attempted to relate, indeed,
 The cause from whence the northern lights proceed :
 If I am wrong, with pleasure and delight
 I'll thank the person that may set me right ;
 As 'tis the truth—the truth I aim to trace,
 And spread the same amongst the human race.

London, Jan. 27, 1791.

C H A P. XX.

Of the CAUSE of the Rain-bow, Meteors, Sun-dogs, Jack-with-a-lantern, Hurricanes, Trade-winds, Monsoons, Whirlwinds, Water-spouts, Clouds, Rain, Hail, Snow, Frost, Mist, Fog, and Dew—The Rising and Falling of the Tides, with an American Tide-Table.

THE Rain-bow is a meteor of divers colours, occasioned by the refraction and reflection of the light of the Sun falling on the surface of the drops of rain.

There are two Bows, the internal, and external. The former is produced by two refractions and one reflection. The first refraction is of incident rays proceeding to one common point, from which they are reflected to another, and from thence refracted a second time to another, which produces the various colours of the bow; as, the red, orange, yellow, green, blue, indigo, and violet.

The external bow is produced by the reflection of the interior bow. The internal is the brightest, and the external the less brilliant.

The higher the sun is above the horizon, the lower will the bow be; but the lower the sun is,
the

the more will the bow be elevated. Rain-bows often appear where great rivers fall down steep places with such rapidity as to raise a mist in the air.

A Meteor is an imperfect mixed body, consisting of vapours drawn up into the middle regions of the air: they appear in divers forms. Some meteors are very large, and make a tremendous noise like a clap of thunder, and even cause the earth to tremble. We have had several in America, since my remembrance, that have made dreadful explosions: they were undoubtedly generated by such combustibles as produce the thunder and lightning; but, in general, they fly through the hemisphere without any remarkable report.

Sun-dogs, called Mock Suns, because they resemble the sun, are two spots that frequently appear in a cloud when the sun shines through it, and when he is about 15 or 20 degrees above the horizon. We often see them in America, and they commonly precede a storm. Their colour is much like that of the rain-bow, and their magnitude equal to that of the apparent solar disc. One is situated on the north, and the other on the south side of the sun. The refraction and reflection of the rays of light are the cause of these phænomena.

We have also circles round the sun and moon frequently in America, which appear something like the rain-bow, but of a paler colour. These are occasioned by the refraction and reflection of the solar and lunar rays, and are signs of rain or snow.

A Jack with a Lanthorn, called *Ignis Fatuus*, or Will with a Wisp, is a fiery meteor, consisting of a viscous substance, or fat exhalation; which being kindled in the air, reflects a kind of thin flame, without any sensible heat. They commonly appear in low lands, in foggy nights; and dance up and down according to the motion of the air. People that attempt to follow them, often wander out of their way, and sometimes run into hedges and ditches. I have seen three of these meteors in my travels.

A Hurricane is a violent storm of wind; and a wind is a current or stream of air, as a river is a current or stream of water. The blowing of the Wind arises principally from two causes, *viz.* from the rarefaction and elevation of the atmosphere by the heat of the sun, and the condensation and depression of the same by the cold. Hence the air, where the sun is verticle, becomes the most heated and rarefied; and being thereby made lighter, rises upwards, and the cold air on either side rushes in to restore an equilibrium. Some suppose that the diurnal motion of the earth is the cause of the blowing of some easterly winds; but when particles are exhaled by the heat of the sun, they must necessarily subside as they become condensed with the cold, and are thereby made heavier than the particles that are underneath: hence they fall, and cause the air which is under them to be driven away; but when they are all subsided, an equilibrium is restored, and the atmosphere is at rest.

Hurricanes

Hurricanes are sometimes so violent, that they tear trees up by the roots; overthrow houses, churches, and steeples; sweep off vegetables and animals, and desolate countries. They destroy vessels on the sea, and throw the watery element into such raging waves and billows that they produce inundations.

The Trade-winds blow from north-east on the north side of the equinoctial, and from the south-east on the south side, and almost due east at and near the equator; but at two or three degrees on each side the winds vary, and it is sometimes calm weather for a month together.

The Monsoons are periodical winds, which blow about six months in one direction, and the other six months directly opposite. These winds shift at the times of the equinoxes, and produce terrible storms of wind, thunder, lightning, and rain. The monsoons are chiefly in the Indian seas, and do not extend above two hundred leagues from the land.

Sea and Land-breezes are also periodical winds, which blow from the land from midnight till about noon; and from the sea, from about noon till midnight. They do not extend more than three leagues from shore.

Beyond the latitude of 30 deg. north and south, the winds blow from all the different points of the compass.

A Whirlwind is caused by three or more winds meeting in one point, which makes them fly upwards; and that which is the strongest, drives the other before it.

A Water-

A Water-spout is a mass of water collected between a cloud and the surface of the sea, in shape of a pillar of water. These spouts are frequent in the West-Indies; and ships that are near them are in great danger, unless the spouts are broken and dispersed by a shot from the cannon. Some have supposed that water-spouts are caused by sulphureous explosions bursting out under the sea; and perhaps that may be the cause sometimes. I do not remember that I ever saw above one water-spout, and that was extended to the clouds: I supposed it was occasioned by a whirlwind. It doth not appear to me, that such explosions are the cause of water-spouts in general; because they would send the water up in an instant, and then it would immediately subside, unless a stream of fiery matter should continue to issue from under the sea. Again, if a fiery explosion was the cause, I should think they would not travel from place to place, as the one did which I saw.

Clouds are a collection of vapours exhaled from the earth and waters into the middle regions of the air; but the more they are rarefied, the higher they rise, and, being lighter than the air that buoys them up, float in the atmosphere until they are condensed by the cold:—hence the upper parts fall on the lower, till a thick mass is formed.

The Rain is caused by the aqueous particles condensing till they become heavier than the air which is under them:—hence they fall in drops called *rain*.

Hail is occasioned by the watery particles meeting with such degrees of cold as to make them freeze after they have been formed into drops.

The

The Snow is produced by the vapours freezing before they get formed into drops.

Frost is caused by the freezing of those moist particles which we call dew.

The Mist is occasioned by the vapours being so condensed with the cold, that they cannot rise high above the earth;—hence they hover about upon and near its surface.

A Fog is caused just like a mist; only the particles are not quite so much condensed with the cold.

A Dew is produced by the condensation and subsiding of the invisible vapours which have been exhaled in the day-time by the coolness of the evening, when the weather is not cold enough to make them freeze.

The Rising and Falling of the Tides are occasioned by the attraction of the sun and moon upon the waters; and the nearer those luminaries are, the higher will the tides be. When the moon is at her perigeon, or in that part of her orbit that is the nearest to the earth, and there happens to be a conjunction or an opposition, the tides will ascend very high: But tides are not only raised every day upon the waters, but upon the land; for the atmosphere rises and falls like the sea, and the higher the one rises, the more will the other be elevated.

There are two kinds of tides, *viz.* the spring, and the neap. The former begins three days before, and continues three days after the full and change of the moon; and the latter happens about the times of her first and last quarters. The
spring

spring tides are the highest, and the neap the lowest.

As the tides follow the course of the moon, it is not high water twice in twenty-four hours, but twice in twenty-five nearly, which is called a lunar day; for, as she moves every day in her menstrual course to the eastward, and as her motion is very unsteady, it is sometimes a little more, and sometimes a little less than twenty-five hours from the time of her leaving the meridian till she returns there again.

At the time of the new and full moon, the sun and moon attract together, which makes the tides rise higher than at other times; but when she is in her quadratures, those attractions are in opposition to each other:—hence, when the sun raises the water, the moon depresses it.

The tides do not rise so high in the torrid zone, as they do in the temperate and frigid: hence they are not so high in the West-Indies, as they are at New-York, Boston, Halifax, &c.

In the Bay of Funday, it is said, they frequently rise seventy feet, owing to the rapidity of the Gulf-stream, which meets the waters that come from the rivers in that part of the world, and throws them up in billows. The tides often rise twenty-five feet at Quebec, although it is situated about three hundred and twenty miles up the river St. Lawrence.

At some places, it is high-water when the moon is on the meridian; at others, some hours before that time; and at others again, some hours after she has passed it. These inequalities arise from the
waters

waters being obstructed by lands, gulphs, and other streams. The general motion of the tides in the great oceans, are from east to west, according to the apparent course of the moon.

When the wind blows the same way with the coming in of the tide at any place, it will be high water sooner than the time mentioned in a tide-table; and when it blows against the tide, it will be full sea later. The higher the tides rise, the lower they fall, as one extreme follows another.

Some have supposed that our terraqueous globe is a living animal, and that it has not only life, but breath, as well as motion; and that its inspiration and respiration is the cause of the rising and falling of the tides:—but this is a matter I shall not undertake to determine at present.

Besides the earth, air and water, the moon hath an effect upon the vegetable and animal creation, and attracts their fluids in proportion to her various situations from the sun, and her different distances from our globe.

I shall conclude this chapter by adding the following Tide-table, which I have taken much pains to construct from the best authorities I have been able to collect. It may be of great service to mariners sailing on the North-American coast, if they shall be pleased to buy, and keep by them, the

AMERICAN ORACLE.

A TIDE-TABLE, exhibiting the Time of HIGH WATER at a great Number of Places in NORTH AMERICA. Constructed and Published at New-York, in 1783.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
0 15	9 0	2 3	3 15	5 54	6 40	7 35	7 48	8 0	8 17	8 30	9 15	9 30	10 0	11 15	11 45	12 0	12 30
1 16	9 49	2 51	4 3	6 42	7 28	8 23	8 36	8 48	9 35	9 18	10 3	10 18	10 48	12 3	12 33	12 48	1 18
2 17	10 37	3 39	4 51	7 30	8 16	9 11	9 24	9 36	10 25	10 6	10 51	11 6	11 36	12 51	1 21	1 36	2 6
3 18	11 25	4 27	5 39	8 18	9 4	9 59	10 12	10 24	11 11	11 10	11 54	12 27	12 42	1 39	2 9	2 24	2 54
4 19	12 13	5 15	6 27	9 6	9 52	10 47	11 0	11 12	11 55	11 42	12 27	12 42	1 12	2 27	2 57	3 12	3 42
5 20	1 1	6 3	7 15	9 54	10 40	11 35	11 48	12 0	12 47	12 30	1 15	1 30	2 0	3 15	3 45	4 0	4 30
6 21	1 48	6 51	8 3	10 42	11 28	12 23	12 36	12 48	1 35	1 18	2 3	2 18	2 48	4 3	4 33	4 48	5 18
7 22	2 36	7 39	8 51	11 30	12 16	1 11	1 24	1 36	2 23	2 6	2 51	3 6	3 36	4 51	5 21	5 36	6 6
8 23	3 24	8 27	9 39	12 18	1 4	1 59	2 12	2 24	3 11	2 54	3 39	3 54	4 24	5 39	6 9	6 24	6 54
9 24	4 13	9 15	10 27	1 6	1 52	2 47	3 0	3 12	3 59	3 42	4 27	4 42	5 12	6 27	7 12	7 42	8 30
10 25	5 1	10 5	11 15	1 54	2 40	3 35	3 48	4 0	4 47	4 30	5 15	5 30	6 0	7 15	7 45	8 0	8 30
11 26	5 49	10 51	12 3	2 42	3 28	4 23	4 36	4 48	5 35	5 18	6 3	6 18	6 48	8 3	8 33	8 48	9 18
12 27	6 37	11 39	12 51	3 30	4 16	5 11	5 24	5 36	6 23	6 6	6 51	7 6	7 36	8 51	9 21	9 36	10 6
13 28	7 25	12 27	1 39	4 18	5 4	5 59	6 12	6 24	7 11	6 54	7 39	7 54	8 24	9 39	10 9	10 24	10 54
14 29	8 13	1 15	2 27	5 6	5 52	6 47	7 0	7 12	7 59	7 42	8 27	8 42	9 12	10 27	10 57	11 12	11 42

An EXPLANATION of the above TABLE.

- A In the first column denotes the Moon's Age, in Days.
- B the time of H. W. at N. York,
- C. London, Eliz., Town Point,
- D. Henep, Cockspur in Georgia,
- E. Savannah, Bedford in Dartm.
- F San. H. Geo. T. Bar, Charl. Bar.
- G Newp. St. Aug. Bar, N. Prov.
- H Cape Fear.
- I Amboy, Providence.
- J Port-Royal Bar.
- K Tybee Bar.
- L Albany.
- M Sunbury in Georgia, Hell Gate.
- N Tarpaulin Cove, Newtown La.
- O Bolton, Reedy If. Falm. Caico-Bay, Say Brook B. Wilm. N. C.
- P White Stone.
- Q N. Hav. Hack. and Pollepel's If.
- R Guildford and Nantucket.

N. B. If you deduct 7 hours and 57 minutes from the time of high water at New-York, it will give the time of high water at Philadelphia.

Deduct 5h. 45m. and it gives high water at Mobile Point, Kingston, and Esopus.

Deduct 3h. 6m. Albany.

Deduct 2h. 20m. Sandy-Hook, George-town Bar, and Charlestown-Bar.

Deduct 1h. 25m. Newport, Saint Augustine Bar, and New-Providence.

Deduct 1h. 12m. Savannah and Bedford in Dartmouth.

Deduct 1h. 0m. Cape Fear.

Deduct 0h. 43m. Amboy and Providence.

Deduct 0h. 30m. Port-Royal Bar.

Add 0h. 15m. Tybee Bar.

Add 0h. 30m. Sunbury in Georgia, and Hell-Gate.

Add 1h. 0m. Tarpaulin Cove, and New-town Landing.

Add 2h. 15m. Boston, Reedy-Island, Falmouth, Casco Bay, Saybrook Bar, Wilmington, North-Carolina.

Add 2h. 45m. White-Stone.

Add 3h. 0m. New-Haven, Hackinack, Pollepel's Island.

Add 3h. 30m. Guildford and Nantucket.

If you would find the time of high water at any place mentioned in the above Table, proceed thus, viz.

1. Find how many days old the moon is, and apply it to this Table.

2. Take

P White Stone.
Q N. Hav. Hack. and Pollepel's I.
R Guildford and Nantucket.

I Cape Fear.
J Amboy, Providence.
K Port-Royal Bar.
L Tybee Bar.

C. Hanlop, Cockspur in Georgia,
Pawtucket, North-Carolina.
Philadelphia.
D Mobile Po. Kingston, Esopus.

2. Take out the hours and minutes which stand in the column for the place you mean to find the time of high water for, which stands against the day of the moon's age.

E X A M P L E.

Suppose you would find the time of high water at New-York, the moon being eight days old :

With the number Eight enter the Table, and against Eight under A, you will find in the second colume, under B, 3h. 24m. the time required, &c.

C H A P.

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C H A P. XXI.

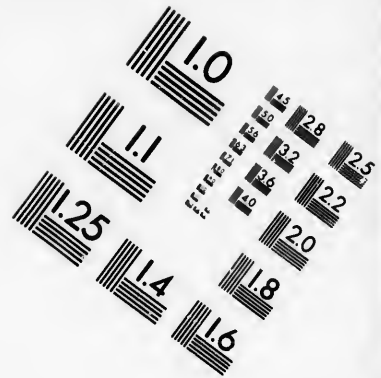
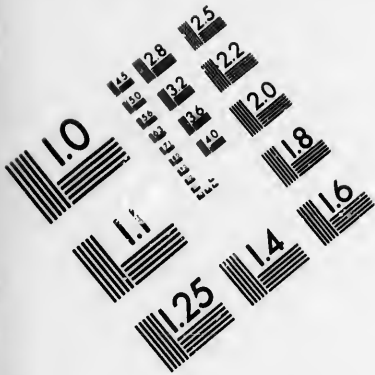
What may properly be called MONEY—Silver a Circulating Medium in Abraham's time—When Metals were first coined according to Chronology—Of Bills of Exchange and Public Banks—Of the good and bad Effects of Paper Money in America—The New Currency ordered to be coined by Congress—The Disadvantages of Bills upon Interest, and of a Sinking Fund—What Currency might be most beneficial to the Nations—Weights and Measures ought to be alike through the World—The Credit of Money rises and falls in proportion to the Demand there is for it—The great Advantages of a Circulating Medium, and the Calamities that follow where People are destitute of one—Why some Countries are drained of Cash—How to get Money, and grow rich.

MONEY is a piece of metal stamped with the effigies of a Prince, or arms of a State, which makes it current and authentic to pass at a common rate for a medium of trade.

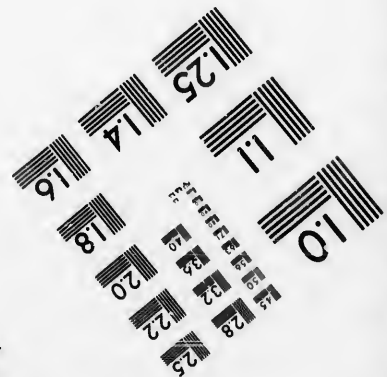
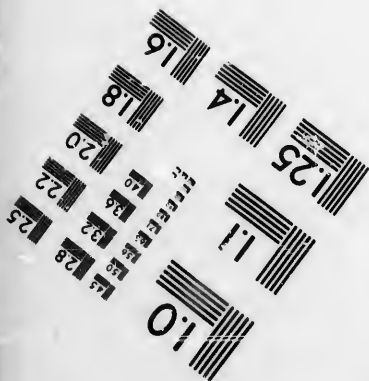
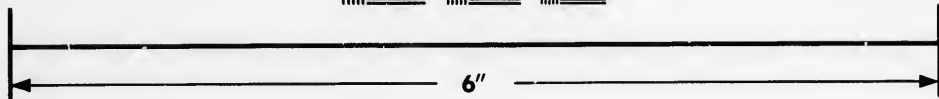
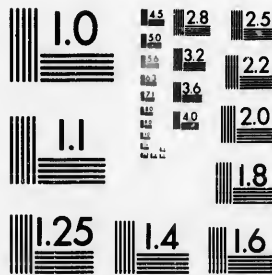
Gold, silver, and copper, are the principal metals used in the coining of money; and nothing but metals coined can properly be called money, although paper, parchment, leather, &c. have been

N made,





**IMAGE EVALUATION
TEST TARGET (MT-3)**



**Photographic
Sciences
Corporation**

23 WEST MAIN STREET
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(716) 872-4503

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made use of for a circulating medium, and called money in divers countries.

It appears by Sacred Writ, that silver was in circulation in Abraham's time; for he bought a piece of ground for a burying-place, for which he gave four hundred shekels of silver, which was about fifty pounds sterling, or but half that sum if the shekels were of the smallest kind: for the Jews had two kinds of shekels; one was equal to two shillings and sixpence, and the other to one and threepence. How long money was in use before Abraham's days, we have no account: but, according to chronology, it was first coined by Phidon, a tyrant of Argos, 894 years before Christ; and first used in England 25 years before the Christian æra, but coined at Rome 269 years before the said æra commenced.

	A. D.
Sterling money first coined in England	- 1216
Gold in ditto	- - - - - 1257
Shillings in ditto	- - - - - 1505
Copper in ditto	- - - - - 1672
Sovereign coin was valued at 20 shillings in	1532
at 24 ditto in	- 1550
at 30 ditto in	- 1552
Guineas went for	- - 30 ditto in - 1688
But were reduced to	- 21 ditto in - 1717
It was ordered that gold should pass by weight, and that which was too light should be recoined	- - - - - June 4, 1774

Hence it appears, that the sacred and profane histories do not agree concerning the first coining
of

of money, for Abraham lived a long time before
Phydon.

	A. D.
Bills of exchange were invented in England	1160
And an act was passed to prevent the sending of any other money out of the kingdom, in	1381
And also another for regulating their pay- ment, in - - - - -	1698
The first public bank was established at Venice, in - - - - -	1550
And that of England, in - - . - -	1693

Bills of exchange, bank-notes, and emissions of paper-money, have been of very great utility in the carrying on of trade and commerce, wherever their credit has been kept up: but where they have lost their credit, they have been very injurious to individuals, and the community at large.

The circulating medium in North America, has consisted of gold, silver, copper, and paper.

There has been a number of emissions of paper-money in that quarter, some of which have been very advantageous in the payment of public taxes and other debts, and in the carrying on of trade and commerce: but others, by losing their credit, have done much damage, not only to the people of that country, but to foreigners.

About the year 1745, paper-money was emitted in New England, for the purpose of carrying on a war against the French, when Cape Breton was taken. This currency depreciated in the Massachusetts, till forty-five shillings were not worth more than a dollar, or four shillings and sixpence

N 2 sterling;

sterling ; and their paper-money in Rhode-Island, till eight pounds were equal to a dollar only.

In 1750, Great-Britain sent one hundred and eighty-three thousand pounds sterling to the Massachusetts, as a remittance to reimburse the expence that province had been at in taking Cape Breton ; and their depreciated paper-money was called in, and paid off at the rate of one dollar for forty-five shillings, and the bills were burnt. Hence, the use of paper-money was totally prohibited in the Massachusetts, till the war commenced between Great-Britain and her Colonies ; and as their imports overbalanced their exports, the province was drained of its money, till it became very scarce : hence they were obliged to carry on much of their trade and commerce by barter.

I am sorry I am not able to tell how their paper-money in Rhode-Island was redeemed, or what became of it ; but the depreciation continued till 1759. They had paper-money in circulation in Connecticut just before the commencement of hostilities between the mother-country and her colonies, and its credit was nearly equal to that of gold and silver.

In New-York, the Jerseys, and Pennsylvania, they were destitute of a paper-currency for a long time ; and as those provinces were drained of their hard money, by reason of their imports overbalancing their exports, the inhabitants, to bring hard money from foreign countries, offered to give more for guineas, crowns, dollars, &c. than their nominal value: hence, eight shillings at New-York,
the

the north part of the Jerseys, and seven shillings and sixpence in the south part, and in Pennsylvania, was given for a dollar. But this scheme had not the desired effect; for, although it brought a little money into those Governments at first, yet the merchants stopped its progress, by raising the price of their commodities in proportion to the elevated price of the coin: the people were therefore obliged to carry on their trade chiefly by barter; a very dull way of doing business:—their trade became so stagnated, and their commerce was brought to such a stand, that they were obliged at last to emit paper-money for a circulating medium. This gave new life and vigour to navigation, trade, commerce, architecture, agriculture, and the settlement of new lands. The inhabitants were greatly benefited by their various emissions, and, to the honour of those provinces, they kept up the credit of their bills equal to that of gold and silver; and they answered for a medium of trade, and the payment of debts both at home and abroad.

The people at Delaware and Maryland had paper-money, which preserved its value equal to gold and silver. In Virginia and the Carolinas they also had paper-money; but I have not learnt that they ever emitted any in Georgia, before the commencement of the hostilities between Great-Britain and her Colonies.

The paper-money depreciated in South Carolina, till thirty-two shillings and sixpence was esteemed to be equal to no more than a Spanish milled dollar; but its credit was raised by taxation,

tion, and remained equal to hard money, till the Province revolted from the British Government.

I have been informed, that the first emission of paper-money in this province, was at the rate of four shillings and sixpence for a dollar; but how their emissions were issued afterwards, I know not; nor how much their paper-currency depreciated in Virginia and North-Carolina, I have not learnt.

It has been said, that the French in Canada and Nova-Scotia had paper-money in circulation when those provinces were taken by the English, and that they lost their bills in consequence of their coming under the British Government. The circulating medium of those Governments at present, is gold, silver, and copper; and their currency is different from that of Great-Britain.

The subsequent Table exhibits the different currencies that have been established in the North American Governments:

	Value of a Guinea.			Value of a Dollar.		
	£.	s.	d.	£.	s.	d.
Canada and Nova-Scotia	1	2	6	0	5	0
New-England	1	8	0	0	6	0
New-York, and North Jersey	1	17	4	0	3	0
South Jersey	1	15	0	0	7	6
Pennsylvania	1	15	0	0	7	6
Delaware	1	15	0	0	7	6
Maryland	1	15	0	0	7	6
Virginia	1	8	0	0	6	0
North-Carolina	1	17	4	0	8	0
South-Carolina	1	1	0	0	4	8
Georgia	1	1	0	0	4	8

In South Carolina and Georgia, the guinea ought to be 21s. 9³d. according to the elevated price of the dollar above 4s. 6d.

These

DIFFERENCE OF CURRENCY IN THE COLONIES. 183

These have been the established currencies; but in some of the Governments south of Canada, their currencies have gone backwards and forwards, and especially in the Massachusetts, Rhode-Island, and South Carolina.

The currencies of the West-India Islands have also varied from that of Great Britain, as follows :

	£.	£.	
At Jamaica	-	140	}
Barbadoes	-	135	
Nevis and Montserrat	-	175	
Antigua and Saint			
Christophers	-	165	
			equal to 100 Sterl.

The reasons why the currencies were so changeable and different from one another in the colonies, are as follow :

1. Those Governments, in their infant state, had but little trade, and of course but little money.
2. They were involved in debt for goods imported from Great Britain.
3. They had not many commodities for exportation, and were therefore obliged to export their gold and silver, which was as much a merchandize as any thing they dealt in.
4. The want of a circulating medium obliged them to emit bills of credit.
5. Their bills falling into discredit, by merchants giving more for gold and silver than the nominal value of the paper-currency; as that of giving forty-five shillings for a dollar in the Massachusetts; eight pounds, in Rhode Island; eight shil-

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4 8
4 8
guinea
levated.

These

lings, at New-York, &c. Hence the credit of the paper-money always depreciated in proportion to the elevated price of the solid coin.

Let us, in the next place, say something concerning the depreciation of the paper-money emitted in America after the commencement of hostilities between Great Britain and her colonies.

The Legislative Assemblies in various Governments emitted paper-money for the purpose of carrying on the war; and afterwards the Continental Congress followed the same example*. The credit of those emissions were equal to that of gold and silver for some time; and many who had hard money, exchanged it for those bills at an equal par: but injured themselves greatly thereby; for, in process of time, the credit of the bills depreciated to that degree, that a hundred paper dollars were scarcely worth one of silver.

Various methods were taken to keep up the credit of the paper-currency: in some places, the prices of the necessaries of life were stated; but all proved abortive, for the credit fell till Congress resolved that the paper-money should be called in by a tax, which was accordingly done; and the paper-currency being lost, the people were greatly distressed for a circulating medium, as law-suits were multiplied, and many imprisoned for taxes and other debts.

It has been said, that the great scarcity of money was the cause of those emissions passing equal to

* Two hundred millions of paper dollars were in circulation about the year 1781.

silver and gold at first, and that they depreciated in consequence of the following occurrences, *viz.*

1. From the rise of the necessaries of life, by reason of the war.

2. By the Loyalists refusing to take the money emitted by the revolted colonies, as they supposed the provinces would be conquered, and that the credit of the paper-money would fall to the ground.

3. From the Quakers refusing to take the money, because they supposed it was emitted for the purpose of promoting the effusion of blood.

4. From counterfeit emissions being put into circulation.

5. From the conduct of sharpers, who monopolized both the foreign and domestic productions, and sold them for extravagant prices.

6. From their having no public funds to redeem those emissions, by exchanging them for gold and silver.

After the commencement of the peace between Great Britain and America, the Legislative Assemblies of Rhode-Island, Vermont, New-York, the Jerseys, Pennsylvania, North Carolina, South Carolina, and Georgia, emitted paper-money, which was a great relief to the inhabitants of those Governments: but their bills depreciated very much in Rhode-Island, and some in Vermont; but not a great deal in the middle Governments, tho' considerably in the Southern. The inhabitants of those States where paper-money has not been emitted since the peace, have been greatly harrassed with law-suits, imprisonments, &c. for the want of a circulating medium.

But,

But, according to the present constitution of the American States, no money but gold and silver is to be made a legal tender in the payment of debts: hence paper will not be made a legal tender, as it was formerly. The British merchants have suffered greatly in times past, by being obliged to take the paper-money when it was depreciated; but now that inconveniency will be removed, for the Congress have passed an Act for the coining of certain pieces of money, under the following names, *viz.*

An Eagle	}	equal to	{	10 dollars
Half Eagle				5 ditto
A Dime				$\frac{1}{10}$ th ditto
A Cent				$\frac{1}{100}$ th ditto
A Mille				$\frac{1}{1000}$ th ditto.

This is to be the currency of the United States, and I understand that all the other currencies are to be abolished: which is a very laudable act of the Congress; for, whilst so many different currencies were suffered to pass through the States, they were productive of many injuries to navigators, traders and travellers, because the bills emitted in one State would not pass in another, which was very detrimental to the transaction of business.

How much money would be sufficient for a circulating medium in the United States, is uncertain: But I should think, that ten millions of pounds sterling would not be too much, according to the number of people; for it is said, that their
inhabitants

inhabitants consist of about two millions and upwards of seven hundred thousand souls; and according to a late publication, their national debt amounts to about sixty-five millions of dollars.

How large the circulating medium of Great Britain is, is unknown to me; but some have supposed it is near ⁶⁰twenty millions, besides bank-notes and bills of exchange. According to the news-papers, the national debt is two hundred and sixty-three millions; but some suppose it is but about two hundred and forty millions.

The number of the inhabitants of France are computed at twenty-five millions; their circulating medium at 91,666,666l. 13s. 4d. and their national debt at 141,666,666l. 13s. 4d. sterling. They cannot suppose that ten millions would be too large a circulating medium for the United States of America.

Bills have sometimes been emitted upon interest in the American States, and have passed as a medium of trade. But this kind of currency has been injurious to the people: For,

1. They were a great hindrance to the transacting of business with expedition, at fairs, markets, shops, &c.; for, whilst the people were counting their money, they had to cast up the interest of their bills before they could tell what they were worth; and thus, much time has been wasted through the inconveniency of such a medium.

2. They were a great damage to people in distress, who wanted to borrow money; for, if the owners of the bills were able to keep them, they would hoard them up in their chests, instead of lending

ing

ing them, because they were sure of their interest whilst they had the principal in their own hands.

3. They diminished the circulating medium greatly, by being hoarded up.—Therefore I cannot recommend bills upon interest for a medium of trade.

Some have supposed, that a sinking fund is the best for a circulating medium, where people are obliged to have a paper-currency in circulation: But of this I disapprove, though it would tend to make the money circulate briskly; for people would be very careful how they kept such money hoarded up in their chests, because its nominal value would be continually sinking; but when they attempt to pay a debt, they must be put to the trouble of computing, before they can know what their money is worth. Hence, if a twenty-shilling bill was to run down in as many years, and the possessor was to put it off after it had been emitted eleven years and two months, he must stand to compute before he could know what it was worth, which, at that instant, would be but eight shillings and ten-pence; and if he had owned the bill but six months, he must lose sixpence of its nominal value: and besides all this, when the credit of such bills are wholly run down, the circulating medium is totally destroyed. Therefore, the people would be obliged to emit new bills, or live without money, if no other currency could be obtained.

This erroneous opinion concerning a sinking fund, hath arisen from some who have supposed that

that a nation is in debt for the money the people emit themselves ; but they will be convinced of their error, when they consider that the nation did not borrow it, that it is their own manufactory, and that they owe nobody for it.

Different nations have different currencies ; but, in my opinion, that of pounds, shillings, pence, and farthings, is the most convenient : and if such a currency was to be established through the world, it might be very beneficial to the nations. It might also be very beneficial to have all the different pieces of coin correspond with the pounds, shillings, pence, and farthings, agreeable to the following Table, *viz.*

	£.	s.	d.	q.	
A Guinea	} equal to {	1	0	0	0
Half Guinea		0	10	0	0
Crown		0	5	0	0
Half Crown		0	2	6	0
Shilling		0	1	0	0
Sixpence		0	0	6	0
Penny		0	0	1	0
Halfpenny		0	0	0	2
Farthing	0	0	0	1	

Likewise Bills of Exchange

	} {	2	0	0	0
		5	0	0	0
Of - - -		10	0	0	0
		20	0	0	0
		30	0	0	0, &c.

Hence the currencies might be alike through all the parts of the known world, if the nations would

would agree to it; and a guinea made in Great Britain, might be equal in weight and value to one made in France; and one coined in France, might be equal to one coined in America, &c. This would be a great advantage in the carrying on of trade and commerce both at home and abroad, as it would save the trouble and expence of reducing the value of one currency to that of another.

This currency would be much easier reckoned than that of dollars and other sorts of coin, for once reckoning might answer: but we have to reckon or count our money twice when we take or put off dollars, &c. for we are obliged to count our dollars first, and afterwards reduce them into pounds, and just so it is with guineas; whereas if they were equal to twenty shillings each, once counting would be sufficient.

And although the guineas and other pieces of money might be made of equal weight and value through the world; yet, the money coined in each kingdom might be distinguished by having the effigies of each King, and the arms of each State, enstamped on it. It is my opinion, that if all the different currencies, with weights and measures, were reduced to one standard through the world, it would be a great benefit to mankind.

A paper currency is the best, if the credit of it is kept up; for it is lighter to carry from place to place, and may be more easily secreted from thieves and robbers, than gold and silver: but if the credit of paper-money is suffered to depreciate,
it

it proves an engine of fraud and oppression, because it reduces people to beggary and want.

The credit of a currency will fall in time of war, in proportion to the advanced price of the necessaries of life. Hence, when Samaria was besieged by Benhadad the king of Syria, the people in that city were so greatly distressed for the want of provisions, that an ass's head was sold for fourscore pieces of silver, which was equal to eighty pounds sterling, and the fourth part of a cab of doves dung for five pieces. *Vid.* 2 Kings, vi. 25.

When people are pinched and straitened, they will sometimes give all their substance for relief. Hence, Satan spake the truth, though he is a liar, when he said, Skin for skin, yea, all that a man hath will he give for his life. *Vid.* Job, ii. 4.

It has been said, that the people of Montreal in Canada were so greatly pinched for salt, just before that place was taken by the English troops, that they gave fifty dollars a bushel for that commodity.

I have already mentioned, that the bills emitted by the Continental Congress, depreciated, in the time of the war, at the rate of a hundred for one. At New-York, the credit of the gold and silver was judged to be depreciated as much as ten for one, whilst that place was in the possession of the British troops, as provisions were ten times as dear as they were before the war commenced; but since the war is over, it is said that the credit of the money is as high as ever it was before the troubles began.

From

From hence we may infer, that the credit of a circulating medium rises and falls in proportion to the demand there is for it, and the elevated price of the necessaries of life: But money ought by no means to be undervalued, because its credit rises and falls; neither ought the people to be deprived of a circulating medium, because its credit has been reduced in a time of public calamity.

There is no intrinsic value in bills of credit or paper-money, as there is in gold and silver; although in reality it is of very great utility in the transaction of business, wherever its credit is kept up, as was before observed. Hence it is necessary to have public funds of hard money, to exchange for that of paper.

A Kingdom or State may have too much, just enough, and not enough money for a circulating medium; for if the Almighty should rain down a shower of guineas upon a kingdom or country, and make money as plenty as the sands upon the sea-shore, it would soon be of little value amongst the people; and its credit would fall, till a ton of gold would not fetch more, if so much, as an ounce will now. It is therefore requisite that every nation should not be overstocked with money, but only have just enough for a medium of trade, and to defray foreign and domestic debts: And it is also requisite, that the people should have a sufficient quantity of specie for these purposes: for, wherever they are destitute, the wheels run heavy; the progress of navigation, trade, and commerce, is impeded; agriculture, architecture,

ture, and the manufactures, do not thrive and flourish: the people are oppressed with heavy taxes, hampered and harrassed with law-suits, and frequently imprisoned for debt. Hence, that people that is destitute of a circulation medium, must be in a deplorable condition.

Surely oppression will make a wise man mad; and where people have heavy burthens laid upon them, which they are unable to bear. When they are in debt, straitened and pinched for money, they run mad; quarrel and contend with one another; commence needless law-suits; take away goods, lands, provisions, and other property; strip poor women and children almost naked, and reduce them to poverty and distress: The honest and industrious husband must go to prison, have his constitution injured by confinement, must be kept from following his lawful occupation; whilst his wife and children are languishing for the necessaries of life. These things are not only hurtful to individuals, but to the community at large:

Vanitas vanissima! ista omnia sunt vanitas!

The want of money also hinders people from travelling abroad, to do business of importance; for if a man is obliged to take a long journey, and is destitute of cash, unless he can carry provisions enough upon his back, or on his horse, to support himself, he must perish on the road, without he turns beggar, which would expose him to the mock and ridicule of the populace; and let him be at home or abroad, he will be teased in his mind, disturbed of his rest, and hindered from

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performing

performing his duty in some lawful employment. If he has money due to him, he will be obliged to spend much time in running after it;—and all to no purpose: his debtors cannot pay him; neither can he satisfy the lawful demands of his creditors. All these, and many more calamities, naturally result from the want of a circulating medium.

The Wife Man said, that *money is a defence*, as well as wisdom. This was a very good observation; for, it defends us against hunger and nakedness, relieves us in sickness and health; prevents our being imprisoned, and having our families ruined by poverty and distress. It gives life and vigour to the cultivation and improvement of the liberal and mechanical arts and sciences, and no nation can be happy without it. *Pecunia obediunt omnia.*

The advantages of a circulating medium are so great, that no nation can be happy without one; and where people are destitute of this auxiliary engine, one ought to be immediately made; and if gold and silver cannot be obtained, something else ought to be substituted. A paper-currency may have all the desired effects, if things are conducted with wisdom and prudence.

Some countries have been drained of their cash, by neglecting to carry on their manufactures, and suffering their imports to overbalance their exports; but such evils ought to be prevented by industry.

I come, in the next place, to show how people may get money, and grow rich. I shall therefore recommend the following, *viz.*

I. Industry,

1. Industry, because the diligent hand maketh *rich*.
2. The abstaining from intemperance, idleness, playing, gaming, and the keeping of bad company.
3. The use of superfluities in apparel and every other thing.
4. The not suffering of our expences to overbalance our incomes.
5. The laying up of something against a rainy day.

If these directions are strictly adhered to, people in general will grow rich; though some may be prevented by unavoidable misfortunes, such as sickness, losses at sea, fire, &c.

We cannot live without labour; for the farms and gardens must be cultivated, or we must starve; and the arts and manufactures must be carried on, or we shall go naked, let us have ever so much money. Therefore, Tom and Dick and Harry, and Jenny and Sally and Nancy, must all follow some lawful employment for a livelihood.

There are two kinds of poor in the world, which are called by some, the Lord's poor, and the devil's. The former are those who are made poor by unavoidable misfortunes; and the latter by sloth, idleness, intemperance, &c. The first are objects of charity; but the latter ought to be treated with neglect and contempt.

Some are born poor, and remain so by reason of oppression, which keeps them in vassalage and slavery all their days: This is the hard fate of many of the poor Africans in some parts of the world.

A TABLE of the Weight and Value of Coins.

GOLD.		SILVER.	
	dwt. gr.		dwt. gr.
English Guinea	5 8	Crown	19 8
Half Guinea	2 16	Half Crown	9 16
Quarter Guinea	1 8	Shilling	3 20
Johannes	18 0	Sixpence	1 22
Moidore	6 18	Dollar	17 8
Dubloon	16 12	Half Dollar	8 16
Pistole	4 3	Quarter Dollar	4 8
Eagle	11 10	Piastereen	3 11 $\frac{2}{3}$
Half Eagle	5 17	Dime	1 17 $\frac{2}{3}$

	Sterling.				NewEngland			New York.				
	£.	s.	d.	q.	£.	s.	d.	£.	s.	d.	q.	
An Ounce of Gold is worth	-	3	17	10	2	5	6	8	7	2	2	2
A Penny-weight	-	0	3	10	3	0	5	4	0	7	1	1
— Grain	-	0	0	2	0	0	2	$\frac{2}{3}$	0	0	3	1
— Guinea	-	1	1	0	0	1	8	0	1	17	4	0
— Johannes	-	3	12	0	0	4	16	0	6	8	0	0
— Moidore	-	1	7	0	0	1	16	0	2	8	0	0
— Dubloon	-	3	6	0	0	4	8	0	1	9	4	0
— Pistole	-	0	16	6	0	1	2	0	1	9	4	0
— Eagle	-	2	5	0	0	3	0	0	4	0	0	0
— Crown	-	0	5	0	0	0	6	8	0	0	0	0
— Dollar	-	0	4	6	0	0	6	0	0	0	8	0
— Piastereen	-	0	0	10	$3\frac{1}{5}$	0	1	$2\frac{2}{3}$	0	1	7	0
— Dime	-	0	0	5	$1\frac{4}{10}$	0	0	$7\frac{2}{10}$	0	0	9	$\frac{6}{10}$

INTEREST

INTEREST TABLES. 197

SIX PER CENT.															
	1 Month			2 Months.			3 Months			6 Months			1 Year.		
£.	£.	s.	d. q.	£.	s.	d. q.	£.	s.	d. q.	£.	s.	d. q.	£.	s.	d. q.
1			1 0			2 1			3 2			7 0			1 2 1
2			2 1			4 3			7 0			1 2 1			2 4 3
3			3 2			7 0			10 2			1 9 2			3 7 0
4			4 3			9 2			1 2 1			2 4 3			4 9 2
5			6 0			1 0 0			1 6 0			3 0 0			6 0 0
6			7 0			1 2 1			1 9 2			3 7 0			7 2 0
7			8 1			1 4 3			2 1 0			4 2 1			8 4 3
8			9 2			1 7 0			2 4 3			4 9 2			9 7 0
9			10 3			1 9 2			2 8 1			5 4 3			10 9 2
10			1 0 0			2 0 0			3 0 0			6 0 0			12 0 0
20			2 0 0			4 0 0			6 0 0			12 0 0			1 4 0 0
30			3 0 0			6 0 0			9 0 0			18 0 0			1 16 0 0
40			4 0 0			8 0 0			12 0 0			1 4 0 0			2 8 0 0
50			5 0 0			10 0 0			15 0 0			1 10 0 0			3 0 0 0
60			6 0 0			12 0 0			18 0 0			1 16 0 0			3 12 0 0
70			7 0 0			14 0 0			1 1 0 0			2 2 0 0			4 4 0 0
80			8 0 0			16 0 0			1 4 0 0			2 8 0 0			4 16 0 0
90			9 0 0			18 0 0			1 7 0 0			2 14 0 0			5 8 0 0
100			10 0 0			1 0 0 0			1 10 0 0			3 0 0 0			6 0 0 0
1000	5	0	0 0 0	10	0	0 0 0	15	0	0 0 0	30	0	0 0 0	60	0	0 0 0

SEVEN PER CENT.															
1			1 1			2 3			4 0			8 1			1 4 2
2			2 3			5 2			8 1			1 4 3			2 9 2
3			4 0			8 1			1 0 2			2 1 0			4 2 1
4			5 2			11 0			1 4 3			2 9 2			5 7 0
5			7 0			1 2 0			1 9 0			3 6 0			7 0 0
6			8 1			1 4 3			2 1 0			4 2 1			8 4 3
7			9 0			1 7 2			2 5 1			4 10 3			9 9 2
8			11 0			1 10 1			2 9 2			5 7 0			11 2 1
9			1 0 2			2 1 0			3 1 3			6 3 2			12 7 0
10			1 2 0			2 4 0			3 6 0			7 0 0			14 0 0
20			2 4 0			4 8 0			7 0 0			14 0 0			1 8 0 0
30			3 6 0			7 0 0			10 6 0			1 1 0 0			2 2 0 0
40			4 8 0			9 4 0			14 0 0			1 8 0 0			2 16 0 0
50			5 10 0			11 8 0			17 6 0			1 15 0 0			3 10 0 0
60			7 0 0			14 0 0			1 1 0 0			2 2 0 0			4 4 0 0
70			8 2 0			16 4 0			1 4 6 0			2 9 0 0			4 18 0 0
80			9 4 0			18 8 0			1 8 0 0			2 16 0 0			5 12 6 0
90			10 6 0			1 0 0 0			1 11 6 0			3 3 0 0			6 6 0 0
100			11 8 0			1 3 4 0			1 15 0 0			3 10 0 0			7 0 0 0
1000	5	16	8 0 0	11	13	4 0 0	17	10	0 0 0	35	0	0 0 0	70	0	0 0 0

nt.

gr.
8
16
20
22
8
16
8
11 $\frac{1}{2}$
17 $\frac{1}{3}$

New York.
d. q.

2 2 2
7 1 1
0 3 1
7 4 0
8 0 0
9 4 0
0 0 0
0 0 0
0 8 0
1 7 0
0 9 $\frac{1}{3}$

EST

A TABLE of the RATES at which DOLLARS pass in the American States.

Dollars.	Vermont, New Hamp- shire, Massa- chusetts, Con- necticut, Rhode Island, and Virginia.			New York, and North Carolina.			New Jersey, Pennsylvania, Maryland, and Delaware.			South Caro- lina, and Georgia.		
	£.	s.	d.	£.	s.	d.	£.	s.	d.	£.	s.	d.
1	0	6	0	0	8	0	0	7	6	0	4	8
2	0	12	0	0	16	0	0	15	0	0	9	4
3	0	18	0	1	4	0	1	2	6	0	14	0
4	1	4	0	1	12	0	1	10	0	0	18	8
5	1	10	0	2	0	0	1	17	6	1	3	4
6	1	16	0	2	8	0	2	5	0	1	8	0
7	2	2	0	2	16	0	2	12	6	1	12	8
8	2	8	0	3	4	0	3	0	0	1	17	4
9	2	14	0	3	12	0	3	7	6	2	2	0
10	3	0	0	4	0	0	3	15	0	2	6	8
20	6	0	0	8	0	0	7	10	0	4	13	4
30	9	0	0	12	0	0	11	5	0	7	0	0
40	12	0	0	16	0	0	15	0	0	9	6	8
50	15	0	0	20	0	0	18	15	0	11	13	4
100	30	0	0	40	0	0	37	10	0	23	6	8
200	60	0	0	80	0	0	75	0	0	46	13	4
300	90	0	0	120	0	0	112	10	0	70	0	0
400	120	0	0	160	0	0	150	0	0	93	6	8
500	150	0	0	200	0	0	187	10	0	116	13	4
1000	300	0	0	400	0	0	375	0	0	233	6	8

C H A P. XXII.

Concerning the Variation of the MARINER'S COMPASS.

The Cause of it is supposed to arise from a Magnetical Effluvia, gradually circulating in the Bowels of the Earth.

THE Mariner's Compass was first invented in the year 1229—exhibited in 1260—improved in 1300—and the variation discovered in 1538, by Sebastian Cabbot.

It appears that the attraction of the load-stone was first discovered by Magnus, a shepherd, who observed its sticking to the iron in his sandals, which were a kind of a shoe open at the top, and fastened with latchets; and that from him the stone had its name, *viz.* Magnes.

This stone is an iron ore, of different colours and solidities; the most solid is the best, and that which is not very heavy. The medical virtues of this stone were known in France before the year 1180. It is somewhat astringent; but is not used in medicine in the present age, though some have lately attempted to cure distempers by the magnetical effluvia which arises from them.

The attraction of the load-stone is at two opposite points, called poles; and if the stone is

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gia.

s.	d.
4	8
9	4
14	0
18	8
3	4
8	0
12	8
17	4
2	0
2	6
4	13
7	0
9	6
1	13
3	6
6	13
0	0
3	6
16	13
33	6

C H A P.

broke into a thousand pieces, each piece will retain its attracting poles; and those that are small, will attract more in proportion to their magnitude, than the larger. The bodies they attract are, iron, steel, and other magnets; but they attract no other metals, unless they are combined with these things. Hence it is supposed, that Animal Magnetism is of some utility in the curing of distempers, because our blood is impregnated with ferruginous particles; and that the magnetical effluvia, that issues from a load-stone by attraction, repulsion, or some other way, operates upon the animal fluids, puts them in motion, and assists nature in throwing off diseases.

The attractive power of the Magnet is the strongest in contact, and it decreases by a proportion not yet found out: but that point which attracts one end of a touched needle, will repel the other.

Fluvius Gio, of Naples, about the year 1440, was the first that discovered, that steel rubbed with a load-stone, and then suspended, would point to the poles of the world; and therefore applied it to navigation.

About ninety-eight years afterwards, Sebastian Cabbot found that the needle varied in Great-Britain, about eleven degrees to the eastward of the north pole. The variation continued easterly near one degree in seven years, till it formed an angle with the meridian of London, of thirty degrees. The variation then shifted westward, and moved with the same velocity; and about the year

year 1600, the line of non-variation passed over England, and the needle pointed directly to the north and south poles. Since that time, the variation has travelled westward, and now makes an angle with the meridian of London, of about 23 degrees. Perhaps it may continue westward till the variation shall be as great that way as it was to the eastward, and then return eastward again. If the occidental variation shall happen to be as great as the oriental, *viz.* 30 degrees, and it shall continue to move about one degree in seven years, the line of non-variation will return again to London in about 315 years from this present year, 1791; and at that rate, a revolution of the magnetical variation will be completed in about 992 years, as it will be that time in removing from the eastern extremity till it returns to the same again. I have been informed, that the line of non-variation has lately passed southward near Madagascar: that it doubled at the Cape of Good Hope, sloped across the Atlantic, touching Brazil; and that it passed from thence, in a serpentine course, through Canada, over the Western Lakes; and terminated at the north magnetical pole, situated about twelve degrees from that of the earth, in the meridian of California: That from thence the line of non-variation passed over the earth's north pole, inclining easterly, over Siberia, Tartary, China, the Landrone Islands, and New Holland, to the other magnetic pole, situated near lat. 56 deg. south, and long. 80 deg. west from London. But the lines of non-variation, and
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the magnetical poles, all move westward at present. I was informed, when I was in Canada, in the year 1788, that the variation in Quebec was 12 deg. west, and 11 at Montreal: those cities are about 170 miles from each other. Hence, the further we go westward from London, the less will the variation be, till we come where there is none; for the variation is greater at London than it is at Quebec, and at Quebec than it is at Montreal.

The whole globe is supposed to be a magnet; and where there are beds of minerals of a ferruginous kind, the power of attraction is very great upon magnetical needles; and surveyors meet with much difficulty in running their lines, by reason of the variation of the Compass.

Some have supposed, that Electricity and Magnetism have a great affinity to each other; because steel, when struck with the lightning, or a strong shock of electricity, immediately receives polarity and magnetic attraction.

I have often been requested to make known my hypothesis concerning the cause of the variation of the Compass—Shall therefore just give my opinion upon the subject; but must observe, that Dr. Halley, a celebrated British Astronomer, supposed that the diurnal motion of the earth was the cause of this variation. However, I believe he was mistaken; because the diurnal motion is always from west to east, but the variation is sometimes one way and sometimes the other. If the motion of the earth was sometimes from east to west, and sometimes to the contrary, and the needle followed it, then might we have just reason

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to suppose that the Doctor was not mistaken; but since the motion of the earth is but one way, and that of the compass two ways, he was undoubtedly wrong in his judgment.

Some have imputed the cause of the variation to high mountains and deep vallies on the surface of the land and sea, and have supposed that they have caused the needles to vary; but I cannot be of that opinion.

In the bowels of the earth, there are beds of sulphur, iron ore, and other minerals; besides subterraneous veins of liquid fires. Now, it seems probable to me, that a subtile fluid, of a magnetical kind, is generated by the fermentation of those things; and that it moves gradually in the earth and waters from west to east, and from east to west, attracting the needle to and from the poles. But I may be mistaken; and it is supposed, that there is not one Philosopher on the globe that is able to determine the matter.

C H A P. XXIII.

A Definition of ANIMAL MAGNETISM, invented in Germany, taught and exploded in France—but practised in England in a different manner from what it was when it was first applied in a Medical way—A New Discovery.

ANIMAL Magnetism is the art of curing of diseases by a subtile fluid arising from magnetical bodies, as load-stones, steel and iron rods, &c. and also by a subtile effluvia which arises from human bodies: the former is now laid aside in the cure of distempers; but the latter is applied for that purpose.

The effluvia that arises from the human body, is combined with the electrical fluid; and the composition is supposed to be a mixture of fire, air, light, and spirit, and so very penetrating as to pass through every part of the human machine: but I imagine there are other kinds of particles in the composition.

This effluvia is of a magnetical kind, because our blood is impregnated with ferruginous particles, which the load-stone will attract. Hence, it may be proper to call the composition and operations, Animal Magnetism.

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It is said that Animal Magnetism was first invented in Germany, by a *M. Mesmer*, who afterwards taught it in France, where five learned men were chosen to see whether it was beneficial or not in the cure of diseases; who declared that it was only an imaginary piece of work, because the experiments used to convince them of its reality produced contrary effects.

When this art was first made use of in a medical way, its Professors employed an apparatus consisting of a large tube, which was partly filled with load-stones; through the tube a number of iron rods were projected, for the purpose of conveying the magnetical fluid to their patients.

The operations were performed by the patient's standing with his breast against the end of one of the rods, and taking hold of it, first with one hand, and then with the other, and by drawing them towards his vital parts; which conveyed the magnetic fluid from the load-stones into his body, as it was supposed. But I have not learnt that it ever produced any violent commotions in the human frame.

Since the invention of this apparatus, I understand that our Britannic Professors have made new discoveries, whereby they have found, that the magnetical effluvia which arises from the human body, is vastly more efficacious in the cure of diseases, than that which arises from other magnets. Hence, they have exploded the first mode of magnetical practice, have wholly laid aside the apparatus, and make use of the new invention only, in the cure of distempers.

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The human body is now converted into an electric or magnetic machine: the arms are the conductors, and the fingers the pointers, for conveying the magnetical effluvia to patients labouring under bodily weakness and indisposition.

In the new method of practice, we are directed to proceed as follows:

1. The operator must place the patient in a chair before him, and some direct that a prayer be made for success in the operation.

2. He must fix all the energy of his soul on the relief of the patient:—His mind must be abstracted from every other thought, and filled with affection, benevolence, kindness, pity, sympathy, constant intention, attention, confidence, and compassion towards the object presented for relief.

3. He must hold the fingers of both his hands towards the invalid's pericardium; and afterwards move them in different directions, as, horizontally, perpendicularly, obliquely, &c. for the moving of them up and down is said to agitate the bile, and produce cructations, vomitings, purgings, &c. But once in a while they must be thrown with great velocity almost to the breast of the patient, and he must rub the part affected with pain or any other disorder.

These operations are said to excite the magnetical effluvia to flow in proportion as the bodily and mental faculties of the operator are engaged: And if the disorder of the patient requires it, a *commoto* will be produced; but if a commoto is not needful, a crisis will follow; or if a crisis is not required,

required, the effluvia will operate some other way, till the patient is restored to health; but the operations must be repeated as occasions may require: and some direct their patients to rub themselves with a cloth.

The motion of the hands of the operator, is called, *treating* the patient. The *commoto* is a disturbance in the human frame, attended with tremors, eructations, vomitings, &c. without a loss of the senses: But a crisis is a kind of a thunder storm raised in the mortal body by the violence of the magnetical effluvia; it is attended with spasms, convulsions, fainting, loss of sense, profound sleep, &c.—But more of this hereafter.

Some of the Magnetical Professors have pretended to cure distempers without the motion of their hands. These operations are performed by an act of the mind, which, with all its powers and faculties, must be set on the patient; and the stronger the mental powers are in the operator, the more effectual the remedy is said to be. In this manner they have attempted to cure patients at a great distance.

As each body is surrounded with an atmosphere, and charged in a greater or less degree with the electrical fluid, or magnetical effluvia; that which has the most motion, is said to produce Animal Electricity, and communicate the fluid through the cutaneous pores into the other body, until an equilibrium is restored.

The incorporation of the atmospheres is said to produce a strange connection between the operator

rator and the patient: The former sometimes feels in his hands and fingers, heat, pain, prickling, numbness, &c. and often a pain in that part of his body or limbs which is affected, which is supposed to be produced by sympathy; and the latter, a kind of a warm glowing sensation, though sometimes cold chills will follow.

I have seen a woman thrown into a crisis by the violence of the magnetical effluvia. She was greatly convulsed, her limbs were distorted, and she had twitchings in her nerves and tendons, a strangulation of her *fauces*, rising in her throat, difficulty of breathing, threatening a suffocation, loss of voice and sense, paleness of face, with a fainting, which was followed by a profound sleep. At last a diaphorisis came on; and sundry torrents of the effluvia being poured upon her, which made her start surprizingly, she awoke in perfect health, as she informed us.

Some who have passed through those dreadful commotions, have pretended they could see through solid bodies, and that human bodies have appeared transparent during the crisis; but these phænomena are very rare, as I have been informed.

The magnetical effluvia, like the motion of the sea, and the operation of other remedies, has different effects on different constitutions; to some it proves emetic, to some cathartic, to some both emetic and cathartic, to some anodyne, to some diaphoretic, to some antiphlogistic, &c. It contains a complete system of the virtues of all the simples and compounds that have been derived from the mineral,
vegetable,

vegetable and animal kingdoms, according to the imaginations of some persons.

Hence it is a specific for all kinds of diseases. We often hear, that it restores the blind to sight, causes the deaf to hear, the dumb to speak, and the lame to walk; but perhaps some extol it too high, whilst others may have too low an opinion of it.

Some have been so imprudent, that they have accused the Magnetic Doctors of curing distempers by the power and influence of evil spirits; but I am sensible they are mistaken, for I never knew that Satan was ever transformed into a physician, though it appears that he has been transformed into an angel of light, and into a minister of righteousness. Vid. 2 Cor. xi. 14, 15.

Although Animal Magnetism was exploded in France before the Britannic Magnetisers had made the late discoveries, yet it may be very beneficial to the human race, for ought we know; for there was a time when all the Philosophers were banished from Rome, notwithstanding they were the wisest and most useful men in the world; and in the year 1552, all the books that had been written upon Astronomy and Geography, those infallible and useful sciences, were destroyed in England, because it was supposed they were infected with magic. Therefore, we ought not to decry our new art, unless we find, upon a due investigation of the matter, that it is of no use in the cure of distempers. Perhaps it would not have been exploded in France, if those discoveries had been made there, which have been made in Great Britain.

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I have attended some of the magnetical operations; and it appears to me, by the best observations that I have been able to make, that the cures are performed by the stagnated fluids and compacted humours being put into circulation, by the motions of the hands of the operators, the action of the magnetical effluvia, and the powers of imagination in the patients.

Certain it is, that some patients will go into a crisis, and that others will be greatly agitated by those operations, whilst others again are not affected at all; but the Professors that I have been acquainted with, have confessed that they could not render a philosophical reason for those things. I have therefore contemplated much upon the subject, and it was a long time before I could determine in my mind how those terrible commotions are produced: but on the 15th of February 1791, I came to the following conclusion, *viz.*

That the thunder-storm raised in the human frame, called the crisis, with the other symptoms, are produced much like the thunder-storms in the terrestrial atmosphere. Let us therefore observe, that when a non-electric body or cloud comes near to, or joins one that is electric, or highly charged with electrical fluid, the latter will discharge itself into the former, and produce terrible commotions, 'till an equilibrium is restored.

Hence, if by the motion of the hands, or by any other means, a Magnetic Operator becomes higher charged with the magnetical effluvia than the body of the patient he is treating, the effluvia will

will discharge itself from him into the patient until an equilibrium is restored; but a crisis, or some other commotions, will be produced by such discharges.

Again, if the body of the patient is higher charged than the operator, the effluvia will be conveyed from the patient into the operator, and produce those sensations of heat, pain, prickling, and numbness, as before mentioned.

Furthermore, if both bodies are charged alike, neither the patient nor the operator will be affected; because the effluvia is in a state of perfect equilibrium.

Thus have I at last rendered a philosophical reason for the cause of the different operations and effects of the magnetical effluvia in the *corpus humanum*. The hypothesis is new, and entirely of my own invention: I did not receive it from any person; neither have I mentioned it to any body. Yesterday was the time I made the discovery: and I think I am not mistaken; if I am, I hope I shall be convinced of my error.

But the powers of imagination will sometimes have a surprising effect in the cure of distempers; and, perhaps, it has been an assistant in some of our magnetical operations.

London, Feb. 16, 1791.

For further information concerning Animal Magnetism, see a Treatise, intitled, "The Mystery of Animal Magnetism revealed to the World," published by the *Author* of the *American Oracle*.

C H A P. XXIV.

Of the Effects of the PASSIONS of the MIND, such as Anger, Surprise, Fear, Terror, Grief, Vehement Desire, Sadness, and Despair—Of the Powers of Imagination—A remarkable Account of Two Women that went into a Crisis, and of two others that went into Convulsions—How a Man was affrighted to death.

THE Violent Passions of the Mind, such as anger, surprize, fear, terror, grief, vehement desire, sadness, and despair; often make great ravages in the constitution.

Anger increases the strength; quickens the motion of the heart, lungs, pulse, and breathing; throws the whole frame into a tumult, and sometimes proves fatal.

Surprize, fear, and terror, contract the vessels in the external parts of the body and limbs, force the blood to the heart and lungs, produce a coldness of the extremities, palpitation of the heart, trembling, congestions in the sanguinary vessels, convulsions, swooning, syncope, apoplexies, palsies, epilepsies, and sometimes sudden death.

Grief, vehement desire, sadness and despair, impair the tone and strength of the nervous system,

system, weaken and retard the motion of the pulse, destroy the appetite and digestion, and produce weakness, paleness of face, looseness of the skin, difficulty of breathing, coldness of the extremities, frightful dreams, melancholy, madness, sleepy diseases, hemiplexy, palsy, gutta serena, faintings, concretions, palpitations of the heart, polypuses, diarrhoeas, hypochondriac and hysteric complaints, flatulencies, cachexy, and the scurvy.

These passions have different effects in different constitutions; but in every constitution they tend to destroy the vital, natural, and animal functions of the body and mind, as,

1. The action of the heart, lungs, and arteries.
2. The manducation of food, and the deglutition and digestion thereof.
3. The muscular motions and voluntary actions.
4. The imagination, judgement, reason, and memory.

The power of fancy is often so great in pregnant women, as to occasion moles, also marks, and other deformities in the bodies and limbs of their children; and it has been said, that some have had the plague and small-pox from a strong imagination only.

Violent love, called love sickness, has produced a cachexy and the green sickness in women.

Too much intense study, or profound and laborious meditations, consumes the strength, weakens the nerves, and inverts the regulation of the natural motions.

But although the passions of the mind often bring on mortal distempers, yet the powers of imagina-

tion have a surprizing effect in the cure of diseases. I have been acquainted with a physician, who said he was once requested to visit a woman that was supposed to be very near her end, but imagined that he could relieve her; and as his circumstances would not admit of his visiting her, and as he knew she was troubled with an hysterick complaint, he sent her several pills, made of nothing but a piece of bread, with strict orders for her to take them, because such pills had saved the lives of thousands. She accordingly obeyed the orders, and recovered; but imagined the Doctor had wrought a miraculous cure.

Of late I have been informed, that a Magnetic Doctor agreed to magnetise his patients at such an hour, when he was about ten miles from them; but at the time appointed he fell into company, and totally forgot his obligation: two women, however, who were his patients, conceited that he was magnetising them at the time he had set, and went into a crisis.

At about eight of the clock one evening, when I was learning to be a physician, three women came running into the house, in a great surprize: two of them threw themselves on a bed, and went into convulsions; and the other sat down in a great chair. I asked what was the matter? But none of them were able to speak for a considerable time. At last the one in the chair informed me, that as they were attempting to walk through a field, something rose out of the grass, that made a strange noise, and appeared like a person in a white sheet. A man who had imprudently wrapped

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ped himself in a sheet on purpose to affrighten them, came into the house immediately, told what he had been about, and that it was not his design to have affrighted them to that degree: But all he could say or do was in vain; the convulsions continued all night, with such violence that it took three or four robust men to hold the patients. This affright was attended with very bad consequences; for one of the women went into a consumption, and died in a short time; and the other frequently had convulsions afterwards.

Here we may observe, that, by the power of imagination, the woman recovered that took the pills;—that, by the same power, the women went into a crisis;—and also, that, by the same power, those affrighted went into convulsions. It was nothing but imagination: they supposed they had seen the devil; but were mistaken—no body had touched them, or hurt them; it was only their fancies that made those terrible ravages in their constitutions.

I will just mention another striking instance of the powers of imagination.

A man who was under sentence of death, was permitted to chuse that mode of execution which he thought would be the easiest, and he chose to bleed to death. At the time appointed for the execution, a Surgeon blindfolded the criminal, tied him to a tree, and hung a bladder of warm water privately to his back, which he opened with a lancet, and cried, the “blood is now running!” “the poor man has but a short time to live!”

The criminal, on feeling the warm water run down his back, supposed he was bleeding, fainted away, and died immediately.

As frights are often productive of very bad consequences, this is to caution all persons into whose hands this may come, against affrighting any of the human race, lest murder shall be committed when it is not thought of. The woman I have mentioned, lost her life by the imprudence of the man that appeared in the white sheet; and he sincerely regretted that he was ever guilty of such a wicked transaction.

I have frequently thought, that monstrous ill-shaped pictures are no-ways beneficial to mankind, and especially to the female sex: perhaps they are too often the cause of those deformities that some children are born with.

C H A P. XXV.

An Account of the SHAKING QUAKERS in America.

THIS new sect sprang up about the year 1779; and an old woman, called the *Elect Lady*, with twelve disciples, all of whom were said to be Europeans, were the founders of a new mode of worship: they drew thousands of people after them, and pretended they were vested with power from on High, to work miracles, heal the sick, raise the dead, cast out devils, and speak in unknown languages.

This Lady resided in the north-westerly part of the State of New-York, where she began to instil her tenets into some of the people there. Afterwards she rambled from place to place, promulgating her religion, gaining proselytes in New-England and elsewhere; and she engrossed the kingdom of Heaven entirely to herself and her followers, to the seclusion of all others.

She pretended, her mission was immediately from Heaven; that she travelled in pain for her elect; could speak in seventy-two unknown languages, in which she conversed with those that had departed this life; that there had not been a true Church on earth since the Apostles' days, until her's was erected;

erected; that both the living and the dead must be saved, in, by, and through her; must confess their sins unto her, and procure her pardon, or they could not be saved; that she gathered her Church both from earth and hell; as every person that had died since the Apostles' time, until her Church was set up, had been damned; and that they were continually making intercession to her for salvation, which was the occasion of her talking in those unknown tongues.

Those that entered into her Church, were obliged to confess their sins, and deliver up their jewels, rings, necklaces, buckles, watches, &c. to be disposed of as she thought fit.

It has been said, that some of those confessions proved beneficial; for some of the members of her Church confessed they had stolen divers things that had been laid to the charge of innocent persons.

When these people carry on their worship, they pretend to praise the Lord by singing, dancing, jumping, turning round, falling down, tumbling, &c. In the mean time, some will be trembling, groaning, sighing, and sobbing; whilst others are preaching, praying, exhorting, &c. Others will be clapping their hands, shouting, hallooing, screaming, and making such an hideous noise that it may be heard at a great distance, and frequently affrightens people.

They often dance three hours without intermission; and when any of them are tired of praising the Lord that way, they are whipped up by others, to make the worship go on briskly. They dance

dance till they are very much emaciated; the women grow pale, appear like ghosts or apparitions, or almost like deserters from a church-yard, if I may be permitted to use the sailors phrase.

They are not allowed to wear superfluities in their apparel: their cloathing is plain, and of a lightish colour.

They make no use of the Eucharist, or of water baptism, in their churches, are averse to wars and fightings, and to swearing, use the plain language, and say yea and nay, instead of yes or no; but all their tenets are not approved of by the other Quakers.

At particular times they labour very hard at their respective occupations, and are very careful that no portion of their time is spent in idleness.

They pretend they hold a correspondence with the Saints and Angels, and that they frequently see and converse with the Spirits of their departed friends.

I have been informed, that the number of Shaking Quakers has consisted of no less than six thousand people; and that many of the men have refused to lie with their wives, because they supposed that they were part of the hundred and forty and four thousand mentioned in the Revelations, that were redeemed from the earth, and were not defiled with women.

They pretend that they have already been made partakers of the first resurrection, and that on them the second death will have no power.

They do not allow instrumental music in their churches, because they suppose that that was ceremonial,

monial, and is abolished. But they pretend, that they carry on their worship by the immediate power and influence of the Holy Ghost, and that they have Scripture warrants for their practice, as, “ Sing unto God ;—Praise ye the Lord in the dance ;—O clap your hands, all ye people !—shout unto God ;—make a joyful noise ;—fall down before the Lord, &c.”

It is said, that the *Elect Lady*, with one of her brothers, died in the Jerseys several years ago.

C H A P. XXVI.

An Account of the BIBLE, and its different Translations—A Short History of Dictionaries—and the Epistles of Philadelphus.

ACCORDING to History, the Old Testament was first written in Hebrew, and afterwards translated into Greek, about 275 years before the birth of Christ, by seventy-two Jews, and by order of Ptolomeus Philadelphus king of Egypt, who had erected a magnificent Library at Alexandria. The Apocrypha was also undoubtedly written in the Hebrew tongue; and it is said, that the New Testament was first wrote in Greek.

The Bible has been translated sundry times into English.

	A. D.
King Alfred translated a part of it.	
Aldemus translated the Psalms into Saxon, in	709
Edfrid, or Ecbert, translated some other parts, in	730
Bede translated the whole	731
Trevisa published the whole in English, in	1357
Tindal's translation brought higher, in	1534
Tindal's	

	A. D.
Tindal's translation revised and altered, in	1538
Published with a preface of Cranmer, in -	1549
Another translation published - -	1551
The same revised by several bishops, and printed with alterations - -	1560
A new translation was published by King James's authority, in - - -	1607

The last translation is the one in present use; but it is not every whit perfect. The want of knowledge in the languages, has been the cause of so many translations and alterations; and it is thought that the present translation might be corrected and amended.

In the <i>Old Testament</i> there are	In the <i>Apocrypha</i> there are	In the <i>New Testament</i> there are
Books - 39	Books - 15	Books - 27
Chapters - 929	Chapters - 183	Chapters - 260
Verfes - 23,214	Verfes - 6,081	Verfes - 7,959
Words - 592,459	Words - 152,185	Words - 181,253
Letters - 2,728,100		Letters - 838,380

	A. D.
The Bible was translated into French, before	1356
The Vulgate edition was printed -	1462
English translation first allowed in every family - - - -	1539
First suffered to be read in churches -	1549
First translated into Welsh - -	1567
The present translation finished - -	1611
No Irish translation 'till - - -	1685
Permitted by the Pope to be translated into any language - - - -	1759

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SHORT HISTORY OF DICTIONARIES.

IT is said, that there are no Dictionaries, or Lexicons, for either the Latin, Greek, or Hebrew languages, that are more than 380 years old. Hence we must conclude, that they had none either in Moses's, David's, or Solomon's time, nor in the days of Christ and his Apostles; but that they have been compiled in these modern ages.

The Dictionaries, like the Translations of the Bible, have gone through several alterations and refinements; and about 60 or 70 years ago, some words in the English language had different meanings put to them: and as time rolls on, it is probable that new explanations of some words, not only in the English, but in other languages, will be made.

It is difficult to tell which of the English Dictionaries are the best; because some are best upon one thing, and some upon another. Bailey's, Fenning's, Johnson's, Entick's, &c. are all good; and there are excellent Dictionaries upon the Arts and Sciences. The like may be said of the Latin, Greek, and Hebrew Lexicons.

THE
EPISTLES of PHILADELPHUS.

E P I S T. I.

Admonitions against the Usage of bad Language.

TO all People, Nations, and Languages, that dwell in all the world:

2. Grace, mercy, and peace, be multiplied unto you.

3. It hath seemed good unto me, to send forth this Epistle, beseeching you to forsake vice, and to follow virtue:

4. That whilst great discoveries and improvements are making in the liberal and mechanical arts and sciences, there may be a reformation amongst those who use bad language:

5. That they would no longer take the Sacred Name in vain, by continuing the practice of profane cursing and swearing; as that of saying, "I swear by God! I swear by Jesus! I swear by the Holy Ghost! &c.—God damn your blood! God damn your eyes! God damn your soul to hell!" &c.

6. That they would entirely leave off the use of those unjustifiable and nonsensical expressions; as those of saying, "That is a damned good man, a damned good woman, a damned good horse," &c.

7. That

7. That they would no longer weary themselves by the usage of such profane oaths, such horrible imprecations, corrupt and abominable language; but that they would swear not at all, use blessing instead of cursing, and adorn their conversation at all times with decent language.

8. That they would consider, that for every idle word, which they have, or may speak, they must give an account on the Day of Judgment; and that by their words they will be justified, and by their words they will be condemned.

9. I beseech you again to forsake vice, and follow virtue.

10. Grace, mercy, and peace, be multiplied unto you all. Amen!

The first Epistle of *Philadelphus* was written from *Anglia*, to the inhabitants of the world, by *Philanthropos*.

The SECOND EPISTLE of PHILADELPHUS.

CHAP. I.

PHILADELPHUS exhorteth the People to remember what was written in his former Epistle.—6. The Tongue an unruly member.

PHILADELPHUS, a lover of the brethren, and a servant of the Most High God:

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2. To

2. To all People, Nations, and Languages, that dwell in all the world :

3. Grace, mercy, and peace, be multiplied unto you !

4. It is my heart's desire and prayer to God, that ye may remember the things that I mentioned in my former epistle :

5. That the word thus spoken may have a suitable impression upon your minds ; that ye may lay it up in your hearts, and practise it in your lives and conversations ; and that it may do you all good, in this your time of trial and probation.

6. Know ye not, that the tongue is an unruly member, full of deadly poison ; a world of iniquity, that defileth the whole body ; and that if any among you pretend to be religious, and bridle not their tongues, their religion is vain ?

C H A P II.

An Exhortation to the Practise of Moral Duties.

I BESEECH you, therefore, my beloved brethren and sisters, that ye abstain from the usage of bad language :

2. That you who are heads of families will be pleased to set good examples before your children and servants, by living holy and exemplary lives, adorned with a good conversation :

3. That ye give those under your care a good education, and bring them up in the nurture and admonition of the LORD.

4. Remember,

4. Remember, that if ye use profane cursing and swearing, with other ungodly expressions, before your children and servants, that they will follow the same evil example.

5. Be careful therefore of your conduct; and teach those committed to your charge, to shun the pollutions that are in the world:

6. To abstain from bad language, bad company, intemperance, idleness, playing and gaming.

7. Frequently remind them of the mortality of their bodies, of the Judgment to come, and of the account they must give at the *Dread Tribunal* for the deeds done in the body:

8. That their thoughts, words, and actions, are registred in the books of Heaven; and that they will be rewarded according to their works:

9. That if they do evil, they will be punished with indignation and wrath, tribulation and anguish; but if they do that which is good, Glory, honour, peace, immortality, and eternal life, will be their reward in the world to come.

10. Grace, mercy, and peace, be multiplied unto you all. Amen!

The second Epistle of *Philadelphus* was written from *Anglia*, to the inhabitants of the world, by *Philanthropos*.

THE
THIRD EPISTLE of PHILADELPHUS.

*The People exhorted to worship the CREATOR—4.
suppress Vice—5. live peaceably—7. and to keep
a Fast, &c.*

TO all People, Nations, and Languages, that dwell in all the world :

2. Grace, mercy, and peace, be multiplied unto you!

3. It hath seemed good unto me to send forth this third epistle, beseeching you to render all proper adoration and obedience to the great Creator, upholder, preserver, and governor of the universe :

4. That ye suppress atheism, superstition, idolatry, sedition, treason, rebellion, and every thing that may tend to dishonour the Creator, and disturb the public tranquillity :

5. That ye live peaceable and quiet lives. in all godliness and honesty; fearing God, honouring Kings, and those that are or may be in authority in the kingdoms and countries where ye do or may reside :

6. That ye be subordinate to every good and wholesome law, and cultivate and improve those things that may promote your own felicity, and the happiness of mankind in general.

7. Keep

7. Keep such a fast as the Lord hath chosen; break the bands of wickedness, undo the heavy burdens, and let the oppressed go free.

8. Deal your bread to the hungry, clothe the naked with a garment, and provide shelter and entertainment for those who are or may be destitute of house and home.

9. Be kind to strangers, to widows, and to the fatherless.

10. Honour the aged, obey your parents, serve your masters.

11. Abuse not yourselves, nor your fellow-creatures, nor even the brutal creation.

12. Do good to all men as ye have opportunity, follow peace, walk honestly.

13. Remember the things that I have communicated unto you.

14. Grace, mercy, and peace, be multiplied unto you all. Amen!

The third Epistle of *Philadelphus* was written from *Anglia*, to the inhabitants of the world, by *Philanthropos*.

C H A P. XXVII.

The PHILOSOPHER'S Religion described—The Place he would chuse for his Abode, and how he would conduct himself through Life, &c.—A new Song on the Works of Righteousness.

I EST any should be in distress,
 To really know what I profess,
 In things of a religious kind;
 I therefore do relate my mind
 To all enquirers, and make known
 The principles which are my own.
 I worship the Great GOD of might,
 Whose wond'rous strength is infinite!
 Truly resisting, at all times,
 Whatever leads to vicious crimes:
 By no means taking worldly pelf;
 Loving my neighbour as myself:
 Helping the poor that are in need;
 To strangers very kind indeed:
 I strive as much as e'er I can,
 To get to be a perfect man;
 By imitating of the blest'd,
 In doing things that's for the best.
 My principles are such as these;
 And men may call me what they please—
 A Turk, a Christian, or a Jew,
 Or one of the Paganic crew.

Composed in America,
 In July 1786.

THE

T H L

PHILOSOPHER'S CHOICE.

1.

IT is my choice to find a place,
 Upon this earthly globe,
 Within some healthy pleasant space,
 To fettle mine abode :

2.

Where I from tyrants cruel rage,
 And robbers, may be free ;
 Where evil men do not engage,
 To spoil true liberty :

3.

Where neighbours are exceeding kind,
 And virtue doth increase ;
 And I, with a contented mind,
 May daily live in peace :

4.

With a good wife, replete with sense,
 Whose manners are refin'd ;
 Whose temper's sweet as innocence,
 And all her actions kind.

Q 4

Too

5.

Too much estate I never chose:
Wou'd be so rich indeed,
That I may help myself, and those
That often stand in need.

6

Thus independent, live I would
In some convenient place,
And spend my time in doing good
Amongst the human race.

7.

My times of leisure I would spend
In studies that are deep:
The benefit of what I penn'd,
I'd let the people reap.

8.

And when my days on earth shall cease,
I'd chuse, among the blest,
A crown of glory, honour, peace,
And everlasting rest.

Composed at *Westminster*, in the Kingdom of *Great-Britain*,
April 27, 1789.

A
NEW SONG,

ON THE WORKS OF RIGHTEOUSNESS.

WHERE dwells the man that dares suppress
The Godly Works of Righteousness?
The wretch that would attempt the thing,
Ought on a gallows high to swing.

*The works of righteousness,
Wherever they've been wrought,
In this world's wilderness,
Much happiness have brought:
They are of great and mighty weight
To mankind in this mortal state.*

Ye noble friends, humane and wise!
We hardly know what profits rise,
How much doth spring we scarce can guess,
From the blest'd works of righteousness.

The works of righteousness, &c.

How pleasing to a righteous soul,
To do good deeds without controul,
To help the brethren in distress,
By gen'rous acts of righteousness!

The works of righteousness, &c.

How galling to a pious mind,
 To see the sons of men unkind,
 To see them oft too much oppress,
 Instead of working righteousness!

The works of righteousness, &c.

My worthy friends, we shall be bless'd
 With glory, honour, peace, and rest,
 If we at all times truly press
 After the thing call'd righteousness.

The works of righteousness, &c.

O Righteousness! thou lovely thing!
 Much profit thou dost always bring:
 The boundless good I can't express,
 Obtain'd by thee, O Righteousness!

The works of righteousness,

Wherever they've been wrought,

In this world's wilderness,

Much happiness have brought:

They are of great and mighty weight

To mankind in this mortal state.

Composed at London, Feb. 3, 1793.

C H A P. XXVIII.

*Of the STATE and CONDITION of the Human Body;
and of the Birds, Beasts, and Fishes; Trees,
Plants, and Herbs—All must die—Whether the
Soul had an Existence before the Creation of Man
—The happy Condition of the Dead.*

THE Human Body is a composition of the four elements; that is, of the earth, air, fire, and water. It is nourished and supported by the vegetable and animal productions, the circumambient air, and fundry liquids. It is constantly flying off by insensible perspiration, and other evacuations; and is so very mutable, that it changes once in seven years, and becomes entirely new. The old body is dispersed among the elements; and the new body is generated out of the materials appointed for nutrition.

The Divine Artificer hath breathed into this body the breath of life; hath implanted in it an immortal soul, which is endowed with rational powers and faculties, and is made capable of worshipping, knowing, serving, and enjoying the *Author* of its being, *viz.* the *Great Incomprehensible Fountain of life and motion.*

This

This body meets with various degrees of pleasure and pain; and being but a temporary building, continues but a short time in this mortal state. It is exposed to an innumerable train of accidents and diseases; and as it is appointed that all men shall once die, at last the appointed destruction comes. The body becomes a lifeless lump, and returns to the elements out of which it was formed. The terrestrial part returns to the earth, the aerial to the air, the igneous to the fire, the aqueous to the water, and the spirit to *him* that gave it.

Thus have I described the composition of the human body, with the state, condition and fate of all mankind.—But not only the human race, but the birds, beasts and fishes, trees, plants and herbs, are formed out of the four elements, and undergo various changes whilst their lives continue; but at last they die, and their bodies are dispersed among the elements.

Some animals, and some vegetables, live a long time; but others are very short-lived. Infants often die, that never saw light. But we only live at the present time; for the time we have lived is past and gone, and that which we have to live is not yet come:—Hence, we only live at the present moment; and our lives are as a vapour, that appeareth for a very little season, and then suddenly vanisheth away. Mankind are like the grass, that is flourishing in the morning, but in the evening it is cut down and withereth. The time of our continuance in this mortal state is so very uncertain, that we cannot tell whether

we

we shall live one moment, or a considerable number of years; but when we become old, we know that we must die in a short time, according to the course of nature.

I have frequently been asked, whether I thought that the souls of men had an existence before the formation of their bodies? And my answer has been, that it is probable they had; for when the Almighty had formed the body of Adam out of the dust of the ground, he breathed into his nostrils the breath of life; and that breath undoubtedly had an existence before it entered into the body formed for its reception, because it proceeded from the Great Fountain of life and motion.

Again—When the Almighty conversed with Job, he said, “Where wast thou when I laid the foundations of the earth?” Vid. Job, xxxviii. 4. It is therefore apparent, that Job was somewhere in the universe when the world was created, though his body was not formed, nor his spirit put into it.

The very materials with which our present bodies are composed, were undoubtedly created when the world was, though they were not framed into these earthy tabernacles. Hence, we may in that sense be called as old as the earth, or the sun, moon and stars, if the earth was created as soon as those luminaries.

Death is only a change from this state to another,—as our bodies return again to the elements, and our spirits to him that gave them; and the dead being at rest, are totally free from the cares, troubles, and vexations of a mortal life. None
are

are afraid of losing their lives or estates, by thunders, lightnings, earthquakes, inundations, storms, or tempests; nor of being destroyed by the war, famine, or pestilence. These scenes of trouble, these perils and dangers, are all over and gone.

SHORT is our passage through this nether world;
 For soon, by death, we from the stage are hurld.
 The tender infants, in their lovely bloom,
 Are often hurry'd to the silent tomb!
 Adults grown up, nay some of ev'ry age,
 By cruel *death*, are taken from the stage!
 The high, the low, the rich, the poor, the small,
 By the great *king of terrors* soon must fall!
 The richest man, (it cannot be deny'd)
 Who with good things most amply is supply'd;
 Whilst he does live, doth grief and trouble find,
 Is oft in pain, and vexed in his mind:
 At last he's struck a fatal stroke by death!
 Down falls his body, and off flies his breath!
 But where it goes, or how far it doth fly,
 No mortal man can tell below the sky.
 The elements that in the body are,
 Return to those from whence they taken were.
 Thus dust to dust, and air to air, we find,
 And heat to heat, are soon again combin'd;
 Water to water, also, soon doth flow,
 And the whole mass to dissolution go!
 Await, O man! thy doom; for 'tis the fate
 Of every creature in this mortal state:
 But when death comes, the spirits rise on high,
 Of godly ones who *in the Lord do die*.
 Thus whilst their bodies are behind at rest,
 Their pious souls with happiness are bless'd.
 O happy state, in which the dead are cast!
 Their pain is gone, and all their trouble's past:
 Need no physician to give them relief;
 Are free from pain, from sorrow, and from grief;

And

And from the rage of all the sons of strife,
And the vexations of a mortal life.
The stand'ring tongue, and the back-biting knave,
Cannot hurt those within the silent grave :
Nor can the thief, who robs by night and day,
Nor any murd'rer who kills on the way.
By no means can the tyrant them oppress,
Nor any mortal lead them to distress.
When roaring winds bring up the thick'ned cloud,
And the grum thunder rumbles out aloud ;
When the earth quakes, and lofty cities fall ;
When places sink, and can't be found at all ;
When inundations o'er the land arise,
And burning mountains burst towards the skies ;
When famine and the pestilence doth rage,
And wicked nations in a war engage ;
When blood and carnage greatly doth expand,
And desolation overspreads the land,
And boist'rous tempests rage upon the sea :
Then are the *dead* from danger wholly free.
They're not afraid of being hurt, or slain,
Like wretched mortals who alive remain.
Let not the living, then, at death repine,
Since it was made by God, an *act divine*,
To raise the just, —the *husband, child, and wife*,
From scenes of trouble, to a better *life* !

C H A P. XXIX.

The Ages of the PATRIARCHS—Thoughts on the Wearing of Mourning, and on the Burying of the Dead under Churches.

ACCORDING to the Scriptures, the people lived much longer in the antediluvian world than they have since, as will appear by the subsequent Tables :

BEFORE THE FLOOD,					Years
Adam	-	-	-	lived	930
Seth	-	-	-	—	912
Enos	-	-	-	—	905
Canaan	-	-	-	—	910
Mahaleel	-	-	-	—	895
Jared	-	-	-	—	962
Enoch	-	-	-	—	365
Methufelah	-	-	-	—	969
Lamech	-	-	-	—	777
Noah	-	-	-	—	950

SINCE THE FLOOD,					Years
Shem	-	.	-	lived	600
Arphaxad	-	-	-	—	438
Salah	-	-	-	—	433
					Eber

		Years
Eber	- - - - - lived	464
Peleg	- - - - -	239
Rue	- - - - -	239
Serug	- - - - -	230
Nahor	- - - - -	148
Terah	- - - - -	205
Abraham	- - - - -	175
Isaac	- - - - -	180
Jacob	- - - - -	147
Joseph	- - - - -	110
Aaron	- - - - -	123
Moses	- - - - -	120
Joshua	- - - - -	110

Hence it is evident, that the days of man have shortened by degrees; for Adam lived 930 years, and Joshua only 110. Some, in these modern times, have lived till they were upwards of 150 years old, though but a very few live till they are an hundred years of age.

It is very natural for people to mourn when they have lost their relations and friends; and I have observed, that some mourn till they greatly impair their health and senses.

The practice of mourning seems to be very ancient; for Abraham mourned for Sarah, vid. Gen. xxiii. 2.—And Joseph mourned seven days for his father, with a great and very fore lamentation. Vid. Gen. l. 10.—Also, the children of Israel mourned thirty days for Moses. Vid. Dent. xxxiv. 8, &c.

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It has been said, that some people have hired mourners to weep and make a lamentable howling at funerals.

Some of the savage nations have cut themselves, and torn their flesh to pieces, in consequence of their losing their relations. And some of the American Indians lay their dead upon scaffolds, where they erect seats for the mourners, who go and sit by the corpse every day for a considerable time, and weep and howl for their departed friends; but if they cannot go themselves, they hire others to howl in their room.

In those parts of Christendom where I have been acquainted, the people in general have made use of black cloaths, ribbands, veils, weeds, buckles, &c. for mourning. But the Spaniards formerly wore white garments for that purpose; and it would do just as well as black in these times, if it was the fashion.

Many families in America have been injured in time past by running into debt for mourning; for it was once the custom for every one in a family to dress in black, when they lost their relations; and if they were not poor, to give a pair of gloves to every one that attended a funeral. This practice was sometimes not only injurious to those who lost their friends, but to those that sold mourning; for they often lost their property, by trusting people that were unable to make payment.

But these excesses have been restrained in some places by the acts of the legislative assemblies, who,

who, if I mistake not, have prudently ordered that nothing should be worn for mourning, but black gloves, a weed, or a ribband, &c. which expence was but trifling.

It was formerly customary in New-England, for every person that had an inclination, to attend a funeral without being invited. The parson of the parish also attended, and prayed with the mourners at the house of the deceased. After prayers, if the deceased was an adult, not less than four, and often six bearers were chosen to carry the corpse to the grave.

The corpse was then moved out of the house, and laid upon a bier placed on a table, where the coffin was opened, and the mourners and others viewed the dead body; which being afterwards nailed up, a pall was put over it. Upon the pall white gloves were laid for the bearers. Gloves were then given to the parson and others that attended. The bearers put on their gloves, and walked with the bier, &c. on their shoulders, to the burying-place; the mourners walking two deep, next to the bearers; and both men and women fell into the procession, and walked in a regular and decent manner. If the burying-ground was at a considerable distance, the bearers were relieved on the way by the people, who took turns in carrying the corpse: but the bearers took their places again when they came near the place of interment; and when they had arrived, they laid down the corpse, took off their hats, and put the body into the grave, which was filled by the by-standers, the mourners standing in the mean

time at the head of the grave. When the burial was over, the oldest male among the mourners returned thanks to the people, for their kindness in attending the funeral. No orations, nor prayers, were made at the grave by the parson, as he had prayed before at the house of mourning.

Sometimes the people walked back with the mourners in procession, and were refreshed at their house with a supper, &c. But the Quakers did not wear mourning, nor allow their coffins to be painted black, nor was a black pall used: their coffins were of the natural colour of the boards they had been made of.

The funeral ceremonies were different in the various governments. In Canada, the people sang as they went with a corpse to the grave; and I have been informed, that they buried shoes, candles, money, &c. with the dead; and also, that that is the custom in other Catholic countries.

In the State of New-York, the people are invited to attend funerals. They assemble at the time appointed. The corpse is carried to the grave by ten or twelve bearers; and the men walk in procession, but the women do not go to the grave.

The parson that attends the funeral, and the physicians that attended the deceased, each of them receives a scarf, that is, linen enough for a shirt, which they wear to the grave over their right shoulders, tied in a large knot under their left arms. These are not only worn at the funerals, but at church the next Sunday morning.

When

When the corpse is interred, they return in procession to the house of mourning, where they find the tables spread, and furnished with spiced wine, pipes and tobacco. They fall to drinking and sinoaking: the conversation runs upon a variety of subjects, some of which are very unsuitable for such solemnities. But they often have a supper, and the house of mourning is converted into a house of feasting. This, however, is not the practice at every funeral in that government.

At Philadelphia, the people are invited to attend funerals. The parson walks before the bearers: and if the deceased was a woman, the ladies walk in procession next to the mourners, and the gentlemen follow after; but if the deceased was a man, the gentlemen walk before the ladies: and the parson delivers an oration at the grave.

The people are invited to funerals at Charlestown in South-Carolina. At the house of mourning, they receive cakes, wine, punch, &c. and also a sprig of green rosemary wrapped in a piece of paper, which they carry to the burying-ground, and throw into the grave whilst the people are burying the corpse. Here the parson either delivers a sermon, or makes an oration, at the time of the interment.

But sometimes, when the snow is deep in America, or when the travelling is bad, the corpse is carried in a carriage to the grave.

The funeral ceremonies are different in Europe, as well as in America. At some places in England, they sing a hymn, whilst they are burying

the dead. I understand that this method is practised by the Moravians, and by the Methodists.

In some places of America, they bury their dead under churches; but it is not so much practised there, as it is in some parts of Europe. This custom was first introduced in England in 750.

I have been asked, whether I thought it is prudent to bury the dead under the churches? And my answer has been in the negative; because the infectious effluvia of putrifying bodies may be so very penetrating, as not only to impregnate the surrounding earth with its poisonous qualities, but even to escape through the bounds of its confinement, infect the air, and spread contagious distempers amongst the living, which must lay a foundation for augmenting the congregation of the dead. But how far my hypothesis may seem rational, I leave to the judgment of Philosophers, and the Gentlemen of the Faculty, to determine.

When people die of putrid disorders, their bodies ought to be buried soon, to prevent the spreading of infectious distempers. But if they die in a fit of the apoplexy, or very suddenly some other way, it may be proper to keep them a few days; because some have come to life, that have appeared to be dead.

In divers parts of America, the graves fall in, and become level with the ground within a year after a dead body has been buried; but in other parts, they do not fall in perhaps in the course of twenty years.—I have been asked to give a reason for these things. My answer has been, that the earth is impregnated in some places with
salineous,

salineous, nitrous, and other particles, which preserve bodies from consuming, and that from hence some graves do not fall in for a long time; and also, that it is impregnated in other places with copperas and other qualities which are capable of dissolving bodies in a short time, and that from hence it is that some graves fall in, in less than a year after a body has been buried; for I have been informed, that a piece of beef will be consumed in a few days, if it is put down into the coppermines in Connecticut.

Moreover, I rendered another reason, that is, the rage of putrefaction in some bodies, which may cause them to dissolve, with the coffins that contain them, sooner than others; for one body has a greater degree of putrefaction than another. I knew four young women, who were twins, that took the dysentery, and were all dead and buried in six days. They were laid within about eighteen inches of each other, and where there did not appear to be any difference in the qualities of the earth. The grave of the one that had the greatest degree of putrefaction, fell in in a short time; but the others did not fall in for a considerable number of years. This I imputed to the violence of the disorder in the putrifying body.

It is customary in great towns and cities in England, to bury the dead upon one another. A gentleman informed me in 1790, that he saw a grave dug just by Westminster-Abbey, and that he counted fifty-three skulls that were thrown out of it, besides other bones:—He also said that the smell was so very disagreeable, that he could but just endure to stand and count the skulls.

Now, who can suppose that the earth is not greatly impregnated with a contagious infection, where so many distempered putrifying bodies have been buried in so small a place as one grave? and, who can suppose that this subtile effluvia does not creep through the earth, and impregnate the air in a greater or a lesser degree with its poisonous qualities?

To conclude, I cannot, for the reasons I have mentioned, think it is prudent to bury the dead under churches, nor very near to them; and as there is room enough in the world, they may be carried to a proper distance, and buried, without being put one upon another. It is our duty to exert ourselves in promoting whatever may tend to preserve our own lives and those of others, and to suppress every evil practice that may endanger ourselves and our fellow-creatures miserable.

It is a manifest abuse of the creation, to deck and adorn ourselves with things entirely needless. —As to the wearing of mourning, it is certain that it can do the dead no good, nor the living any further than that of covering their nakedness, and screening them from the inclemency of the weather. The burying of gold and silver with the dead, and other things that can do no good, is also an abuse of the creation;—and it is the duty of every rational creature to guard against excess in these things. If people have any thing that they can spare, let them give it to the poor; instead of burying it in the ground, or wasting it for superfluities.

C H A P. XXX.

Thoughts on the SLAVE TRADE—The Thunder of the Law, the Thunder of the Gospel, and the Thunder of the Conscience, forbid this abominable Practice.

ONE thing is practised in some parts of Christendom, which is an abomination to the Lord, and a disgrace to the human race. It is that of stealing our African brethren, carrying them from their country, felling them like horses, sheep, or swine; and the keeping of them in cruel bondage all their days, without the allowance of any freedom, or even leave to return to the place of their nativity, to visit their families and friends.

Many of those miserable objects who have the misfortune of being born of such stolen and enslaved parents, have but a gloomy prospect before them; because they are obliged to spend the whole of their days in vassalage and slavery, without enjoying that liberty which is the natural right of every man: And not only so, but they are liable to be sold from place to place, like animals belonging to the brute creation.

This

This abominable practice commenced in Portugal, in the year 1443; in England, in 1562: and at Virginia, in 1620:—But, to the honour of the British Parliament, the Negroes are not enslaved in Great-Britain at the present time.

Surely those that follow this illicit trade, must be as hard-hearted as old wicked Pharaoh, the tyrannic King of Egypt:—nay they are more wicked than he was; for he only oppressed those he had under his own government, within the limits of his kingdom, without being guilty of the horrid sin of going abroad to follow the practice of theft and robbery. Hence he was guilty of but one crime. But our tyrannical wretches are guilty of two: the first is that of man-stealing; and the second is that of bringing their fellow-mortals, with their posterity, into cruel bondage and slavery, as long as life continues.

If the LORD, on hearing the cry of the oppressed Israelites, came down and punished the Egyptians with a number of heavy judgments, when they were guilty of but one crime; of how much forer punishment must those be counted worthy, who are guilty of two abominable crimes?—But though such offenders may sometimes escape punishment in this life, yet, by their hardness and impenitence, they treasure up to themselves wrath against the day of wrath, and the revelation of the righteous judgment of God, who will render to every man according to the deeds done in the body.

Let those that live in the practice of these abominations, listen,

1. To the thunder of the Law;
2. To the thunder of the Gospel; and,
3. To the thunder of Conscience.

1. To the thunder of the *Law*.—The Law expressly says, “Thou shalt not steal;” and again, “He that stealeth a man, and selleth him, shall surely be put to death.” Hence, those that follow the Slave Trade, ought to be executed.

2. To the Thunder of the *Gospel*.—“Indignation and wrath, tribulation and anguish, upon every soul of man that doth evil: For the wrath of God is revealed from Heaven, against all ungodliness and unrighteousness of men.”—“For the Law was not made for a righteous man, but for the ungodly and profane, for murderers of fathers, for murderers of mothers, for perjured persons, for man-stealers,” &c.—It is therefore evident, that those who steal, sell, and enslave their brethren, disobey the Gospel, and make themselves liable to the dreadful punishments denounced against such rebellious sinners.

3. To the thunder of *Conscience*.—This tells you, that all nations were made by the Almighty: that they are all entitled to freedom, though it hath pleased the *Former* of their bodies to make them of different colours and complexions: That man-stealing, and the bringing of your brethren into cruel bondage, is a transgression of the Law, and a disobedience of the

Gospel:

Gospel: That whatsoever ye would that men should do unto you, ye should do even so unto them: that you do not do as you would be done by, when ye practise these abominations.

That should the Negroes follow your evil example; should they come into your country, and steal yourselves, your fathers and mothers, your brothers and sisters, your wives and children; and carry both you and them, bound, and almost starved, into Africa; there to be sold, put under task-masters, and kept in cruel bondage all your days; do you not think that such treatment would be very cruel and unjust? Surely the thunder of conscience must say, *yes*.—Why then do ye follow this infamous, this diabolical, disgraceful, and abominable practice? Surely such offenders ought to be branded with infamy, spurned from society, and treated with neglect and contempt, for disgracing Christendom with their atrocious conduct.

Is it not very strange that this disgraceful kind of theft, oppression, and tyranny, has not been suppressed by the Legislators in those countries where such abominations are practised?—Why do they not follow the laudable example of the British Parliament? Why do they not follow that of the Legislators in New-England, New-York, the Jerseys, and Pennsylvania, who have liberated the poor Africans from the shackles of their bondage?—It is said, that this abomination is still practised in the governments South of Pennsylvania, in the West-India islands, and in the Spanish dominions: But those that follow this evil practice, must certainly

tainly incur the displeasure of the *Most High*, and expose themselves to his wrath and indignation.

Listen, therefore, O ye transgressors! to the thunder of the Law, to the thunder of the Gospel, and to the thunder of your own Consciences. Refrain from your evil conduct;—forfake the practice of man-stealing;—break your bands of wickedness;—undo heavy burthens;—and let the oppressed Africans be released from the shackles of their bondage, and the chains of their vassalage and slavery, lest ye debar yourselves *from entering into that rest which remains for the People of God.*

London, March 5, 1791.

CHAP.

C H A P. XXXI.

*Who ought to be licensed to keep PUBLIC-HOUSES—
Of Drunkenness and Gluttony; how Drunkards
ought to be managed—Of the Exils which attend
Gaming, Lying, and Stealing—A Caution against
the keeping of Bad Company.*

NO person should be licensed to sell spiritous liquors, unless he can be well recommended for his sobriety and good behaviour; and he should be strictly enjoined to beware of entertaining bad company, that of drunkards in particular, whose excess in this abominable vice not only proves ruinous to themselves and families, but often an inlet to every species of wickedness, to the hurt of mankind in general.

An inn-keeper ought to be well furnished with every-thing necessary for the entertainment of travellers. He ought to allow no gaming in his house; because it has a tendency to waste both time and money, and also to disturb sober people, who may be inclined to take their rest. He ought also to decline giving his town-customers liquor, when he observes they have got enough; and to clear his house of their company, when it is time for them to go home to their wives
and

and families. If they insist upon having more liquor, his presenting them with a little small-beer or water will perhaps satisfy their thirsty cravings, and may be the means of their going home soberly.

Drunkards ought not to be allowed to haunt inns, taverns, or ale-houses; as they not only do hurt to themselves, families, and connections, but also to the houses they frequent, by preventing decent people from entering them to do business, for which purpose they are particularly intended, as well as for entertainment. Some go to the ale-houses on Saturday evenings when they have received their wages, where they stay till their money is spent, while their families are perhaps in want of the necessaries of life.

The abominable vice of drunkenness, which prevails so much under the sun, burns up beauty, hastens age, makes a man a beast, a strong man weak, and a wise man a fool. It destroys the credit, reputation, wealth, and health of millions; as many a good constitution has been ruined by it. By the immoderate use of spiritous liquors, gouts, dropsies, rheumatisms, consumptions, and many other distempers, are generated, which cut down great multitudes, before they have lived half their days: Numbers of poor women and children, who once lived in affluence, are reduced to beggary and want, by the imprudent conduct of those that waste their estates by intemperance. Nay it is thought that intemperance kills more than the sword.

A drunkard

A drunkard is a plague to himself, a trouble to his family, a disgrace to his neighbours, and a pest to society. He is like a ship without helm or ballast, under full sail to destruction. He is despised by all good people; they treat him with neglect, and shun his company. When intoxicated, he is incapable of taking care of himself; in danger of falling into the fire, and water; of being killed by carts, coaches, waggons and horses, when he attempts to walk abroad; of perishing with the cold in severe weather, and of being robbed and murdered in the streets and highways.

People who are apt to drink to excess, should be watched and governed by their friends; for if they are not capable of taking care of themselves, it ought to be done by others.

If any person intoxicated with liquor comes into an inn, he ought to be turned out, to prevent the company from being interrupted; or if the weather is stormy, and he is in danger of perishing with cold, he ought to be put into some apartment by himself, and allowed only water till he becomes sober.

As many are much indisposed after drinking too much, I will prescribe a cure for that dangerous distemper:

1. Let the drunkard's head be raised.
2. Dip a sponge in vinegar, and hold it to his nose.
3. Let him be blooded.
4. Give him water to drink.
5. Pour cold water on his head.
6. Give

6. Give him a cathartic, or inject a laxative *enema*.

7. Put his feet into warm water.

8. If he recovers, keep him from spiritous liquors.

Gluttony is another vice that prevails too much; and though it does not destroy the senses by intoxication, like spiritous liquors, yet it hurts the vital, natural, and animal functions, and generates dangerous distempers.—The wise man says, *The drunkard, and the glutton, shall come to poverty.* Prov. xxiii. 21.—Again, the Apostle Paul says, *Drunkards, &c. shall not inherit the kingdom of God.* 1 Cor. vi. 10.

Gaming ought by no means to be allowed in any kingdom or state; because it is injurious, not only to individuals, but to the community at large. It is attended with a train of evil consequences, such as loss of time, credit, and reputation. It leads people into intemperance, such as drunkenness, &c.; generates contentions, divisions and animosities amongst friends; occasions wranglings, quarrellings, bad language, and fightings—and sometimes the loss of lives.—Hence, people that are one day very rich, may the next day be very poor; and families in affluent circumstances to-day, may be reduced to poverty and distress to-morrow.

Both drunkards and gamesters, that persist in their evil courses, ought to be confined in work-houses, and kept in some lawful employment; by which means they may in time, upon reflection, become useful members of society.

If any man, woman, or child, shall be inclined to undo themselves, let them take to lying and stealing, or either of them may answer alone for the purpose: For, besides the danger of fines or imprisonments, the whip or the halter, the liar and the thief are exposed to the hatred of all good people, and even to that of one another. Liars cannot be believed, even when they speak the truth; and if any thing is stole, it will be laid to a thief's charge, whether he is guilty of the crime or not. In short, liars will not believe one another, and thieves are jealous of each other when goods are stolen.

These miserable animals are always in a wretched condition; for wherever they are known, people are afraid to harbour them in their houses.

Liars may do much damage in places where their characters are not known, by defaming the innocent; and if they are permitted to bear false witness, they may be guilty of the horrid crime of shedding innocent blood.

People of the best credit and reputation are therefore always in danger of being injured by liars and thieves. Hence such villains ought not to be suffered to run at large; but ought to be confined in some place from which they cannot escape, and there kept to hard labour.

The Legislature of the Massachusetts have contrived a very laudable mode of punishment for thieves, and other villains whose crimes have not been so heinous as to bring the offenders to the gallows.—They are sent to Castle William, which is an island surrounded by water, and situated
about

about three miles from Boston, from which they cannot easily make their escape. There they are kept to hard labour, the profits of which are converted to the good of the public. Some are confined for one year, some for two, three, &c. and some for life. Their punishments are in proportion to the magnitude of their crimes.

This laudable example ought to be followed by all nations; for it is much better for the community to have such vagabonds kept in lawful employment, than to have them confined in prisons at the expence of the public; or to allow them to strolc from place to place, robbing and stealing for a livelihood.

Let all liars remember, that whilst they live in that wicked practice, they are the children of the devil, who is the father of lies. John viii. 44.—That the Lord is the hater of a false witness, that speaketh lies. Prov. vi. 17—19.—That all liars shall have their part in the lake that burneth with fire and brimstone, Rev. xxi. 8. except they repent and reform from their evil courses. Let him that stole, steal no more; but let him labour with his hands, to get something for his maintenance, and to make restitution to those he has injured by his atrocious conduct. Eph. iv. 28.

I.

IF you're at home, or on a route,
Beware of knaves that run about
To rob and steal;—of them be shy,
And guard yourself when they come nigh.

2.

A correspondence have you not
With any thief, or drunken sot:
Haunt not the taverns, nor grog-shops,
With gaming beaus, and silly fops.

3.

To keep with them always refuse,
Who frequently bad language use;
From ev'ry gang that is too rude,
And all those wretches that are lewd.

4.

Left they, before you are aware,
Lead you into some dreadful snare,
Destroy your innocence and fame,
And bring upon you a bad name.

5.

Thus, if bad company you shun,
To vice you'll not be apt to run:
In good repute you may remain,
And shun much trouble, grief, and pain.

C H A P. XXXII.

Of Whoredom, viz. That of Idolatry, Adultery, and Fornication.

THERE are several kinds of Whoredom; such as,

1. The worshipping of false gods.
2. Adultery, or an unlawful connection between married persons.
3. Fornication, or an illegal correspondence between those that are unmarried.

All these abominations are called whoredom.—Let us therefore observe, That when the Israelites forsook the worship of the Most High, and paid homage to idols, it is said that they went a-whoring after their own inventions. Vid. Psa. cvi. 39.—That when David had an unlawful correspondence with the wife of Uriah, it was said that he committed adultery. Vid. 2 Sam. xi. 4.—And Shechem committed fornication with Dinah. Vid. Gen. xxxiv. 2.

Whoredom of every kind is an abominable vice. It tends to destroy our felicity in this life, and our happiness hereafter; for besides the sin of not worshipping the True God, whoredom raises a spirit of jealousy between a man and his wife; produces

duces contentions, divisions and animosities, breaks up families, and blasts their reputation. It also hurts the credit and character of unmarried persons, and reduces them to beggary and want, which excites them on to commit other abominations, such as theft, robbery, murder, &c.—By means of a whorish woman, a man is brought to a piece of bread, says Solomon, Prov. vi. 26. So also, by the means of a whorish man, a woman is brought to a piece of bread, says the *Author* of the *American Oracle*.

How does the world swarm in this degenerate age, with a great multitude of miserable wretches, who, by reason of whoredom, are reduced to such poverty and distress, that they are destitute of house and home, of food, raiment, and other things necessary for their subsistence!

In this deplorable condition they remain till they are thrown upon the town, confined in work-houses, or cast into prison, for theft or some other crime; and the poor children of such degenerated parents must be maintained by the parish, or by the charity of some friends, otherwise they must perish with hunger.

Those that live in the practice of these vices, pass through much care, trouble, and vexation of spirit. The whoremonger is continually afraid of being seized by an officer, and either committed to prison, or of having his estate taken from him to support those vicious, lewd, debauched creatures, with whom he has had a correspondence.—The whore is also afraid of the miseries she may bring upon herself by her evil conduct. In short, both
live

live in fear that their reputations will be destroyed, and their constitutions ruined, by the reception of a certain *virus*, which will be mentioned in the subsequent chapter.

Let all persons who have any regard for the preservation of their health, wealth, credit, reputation, and salvation, shun the company of lewd men and women. This may prevent that anxiety, poverty and distress, which will inevitably come upon those who keep their company, and follow their evil practices.—Let whoremongers, adulterers, and fornicators, forsake their evil conduct, and live pious and virtuous lives for the future; and let them remember the words of the Apostle, *viz.* that marriage is honourable in all, &c. but that whoremongers and adulterers God will judge. Heb. xiii. 4.

Various punishments have been inflicted for idolatry, adultery, and fornication. Under the Mosaical law, idolatry and adultery were punished with death, and fornication by a fine. The Babylonians, Arabians, Tartars, Indians, Javans, and Mexicans, made adultery and fornication a capital crime. The Turks drowned such women, and put the men to great torture. The Hungarians executed those guilty of such crimes. In Great Britain, adulterers are fined, and fornicators are obliged by the law to pay a certain sum of money for the support and maintenance of their bastard children.

In the Massachusetts, adulterers are punished by fines, imprisonment, setting on the gallows, standing in the pillory, and by being whipped at

the post.—Fornicators are fined; and if a married man and woman has a child within six or seven months after they have been married, they are obliged to make a public confession before the church and congregation unto which they belong, or they are debarred from having their children christened.

Some of the clergy have made such unfortunate persons acknowledge, that they had been guilty of a breach of the seventh commandment, *viz.* of committing adultery. Thus they have been induced to tell a lie before the *Lord*, the church, &c.; for adultery cannot be committed when both of the persons are unmarried.—Some again have made them acknowledge, that they had been guilty of the sin of uncleanness; and others, that they had been guilty of the sin of fornication.

To conclude, neither Christ nor his Apostles have imposed any such degrees of punishment under the gospel dispensation; and reason and common sense tells us, that fines, imprisonments, &c. cannot forgive sins. Therefore, let all those who have been guilty of such abominations, “go their way, and do so no more, lest a worse thing should come upon them.”

C H A P. XXXIII.

Of the VENEREAL DISEASE—Its terrible Effects on the Human Body—How to cure the Distemper.

THIS malady is called the plague of Venus, the venereal pestilence, the French disease, &c. It was not known in Europe till it was brought from the Spanish West-Indies into Spain, by Christopher Columbus's men, in 1493.

In 1494, it was carried from Spain to Italy; and in 1495, it was spread in Naples and France; and from those countries it was spread over Europe. Not only Europe, but America, and all parts of the habitable world where trade and commerce are carried on, have become infected in a greater or lesser degree. It has lately found its way among the innocent inhabitants of the islands newly discovered in the Southern Ocean, who being ignorant of the method of cure, have been in a deplorable condition: and I have been informed, that it is endemic in Peru.

When it first began in the Spanish West-Indies, or what it proceeded from, I believe no mortal can tell; but it has been supposed that it originated from a vegetable or an animal poison.

However,

However, it is but a supposition, without any substantial proof.

Perhaps this disorder has done more damage in Europe, than the discovery of America has done good; for it has slain thousands, and ruined the constitutions of an innumerable multitude of people. Every one of the human race is liable to take this terrible malady. The high and the low, the rich and the poor, the young and the old, the honest and the dishonest, are continually exposed to it. An honest husband may take it of a dishonest wife; and an honest wife may take it of a dishonest husband.

The *virus* may be communicated various ways; for, besides that of an impure contact and coition with an infected person, a nurse may take it, by suckling a child born with it, or otherways infected; and a child may take it, by sucking a woman labouring under that complaint. It may also be taken by kissing a person whose mouth is ulcerated, and by the reception of the poison in any part where the skin is off. I knew a physician that was afflicted with an universal taint, who affirmed to me that he took it by handling a venereal patient when he had a wound in his finger. In short, wherever the *virus* can get through the skin, it will enter into the mass of the fluids, and lay a foundation for a confirmed *lues*.

The stronger the *virus* is, the sooner it will operate. I heard a patient say, that he felt it immediately after he had taken the infection; that the poison seemed to run like a wild-fire, and in
less

less than 24 hours produced a cordee, and other bad symptoms.

Sometimes it is very slow in its operation; but the symptoms generally appear in three or four days after the infection has been received. It operates different ways in different constitutions. It usually begins with a sensation of heat, and pricking pain in making water: then comes on a running of virulent matter, of a white, yellow, green, or bloody colour; followed with a stricture, a cordee, phimosis, paraphimosis, strangury, buboes, chancres, warts, cutaneous eruptions of a red, white, or blue colour; nocturnal pains, inflammations, swellings, excoriations, ulcers, fissures, ophthalmies, loss of sight, deafness, carious bones, spinas, ventosas, nodes, tophs, ganglions, gummas, caruncles, gangrens, and mortifications.

Sometimes the *virus* runs to the nose, and eats it off.—When the running is stopped, or what is improperly called a *gonorrhœa sicca* comes on, then the *virus* enters into the mass of the blood, and the patient is in a dangerous situation.

Men, by reason of their different formation, have more complaints than the women; and children born with the disorder, are worse to cure than either.

The ancient physicians were entirely unable to cure this terrible malady, till they discovered the virtues of the *argentum vivum*. This discovery was made about the year 1522, which was 29 years after the poison was first brought into Europe. This is an excellent specific, and the only remedy

remedy I believe that will perform a *radical cure*, though it must be sometimes combined with other medicines. But it has been said, that the North American Indians can cure themselves when half rotten, with a decoction of the *rad. lobelia*; but I never in all my travels could get any of it.

The methods of cure must be according to the constitution and circumstances of the patient. The venereal *virus* must be destroyed; the parts defended against its acrimony; and the irritation which it causes abated. Hence phlebotomy, a diluting antiphlogistic regimen, joined with mercurials, and sundry vegetable productions, must be exhibited; and every thing avoided that tends to inflame the blood. I have often observed, that mercurial frictions are very efficacious when the taint is universal; but they must be used with caution. The warm bath and mercurials joined with opium, are also very beneficial.

Let those that may have this disorder, apply immediately to some skilful physician, instead of tampering with medicines themselves, or of applying to quacks, who impose upon the ignorant world with nostrums which will not perform a radical cure. It is a pity this *virus* cannot be expelled out of the world;—but how it can be done I know not; unless all the people were put under a course of physic at one time, and even then I believe it would be difficult.

C H A P. XXXIV.

*How to chuse a good WIFE, and a good HUSBAND
 —How young Gentlemen and Ladies ought to con-
 duct themselves if they intend to get married—
 How Husbands and Wives ought to treat each
 other, bring up their Children, and behave to
 Servants—Of the Duties of Children and Servants
 to their Parents and Masters.*

THE chusing of a good wife, and a good husband, are matters of very great importance; because a disagreeable companion must make a man, or a woman, very unhappy:—Therefore, let those unmarried Gentlemen, who may intend to enter into the bands of matrimony,

Chuse one that has an honest mind,
 Who is to moral good inclin'd;
 Endow'd with decency and sense,
 A temper mild as innocence.

And let the Ladies, who may be inclined to marry,

Chuse one that's pleasing to their sight,
 Whose character is very bright;
 Whose temper's good, whose noble mind
 To pious actions are inclin'd.

Those

Those who have such excellent tempers and dispositions, are the only proper persons to enter into a married state; because they will live in peace and harmony, and make good members of society.

If Harry pays his addresses to Nancy, under the pretence of marriage, she ought to consider of the matter well, before she consents to enter into the solemn obligation.—Hence she ought to know,

1. Whether he has common sense.
2. Whether he is good-natured, humane and generous.
3. Whether he is honest in his dealings.
4. Whether he uses bad language.
5. Whether he is a drunkard.
6. Whether he wastes his time and money in gaming.
7. Whether he keeps good company.
8. Whether he has been obedient to his parents and masters.
9. Whether he is industrious, or addicted to idleness.
10. Whether he belongs to a creditable family; though none that behave well, ought to be despised for the ill conduct of their relations.
11. Whether he is a man of his word, and punctual in fulfilling his obligations.
12. Whether she likes his person, religion, conversation, and behaviour.
13. Whether it is probable he can support her in sickness and in health, &c.

Now

Now if she shall find that Harry is possessed of but few of these properties, and addicted to many failings, or that she cannot love his person, religion, &c. she had better not marry; because, if she does, she may be miserable afterwards.— And Harry, before he attempts to marry, ought to consider of all these things; and to find by appearances at least, that Nancy's person, sense, temper, and conduct, will be agreeable.

Many people rush too suddenly into a married state, without weighing these things well in their minds before-hand.—Hence, a foundation is laid for contention and discord, as well as for much trouble and vexation.

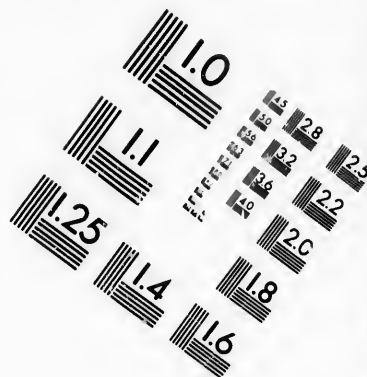
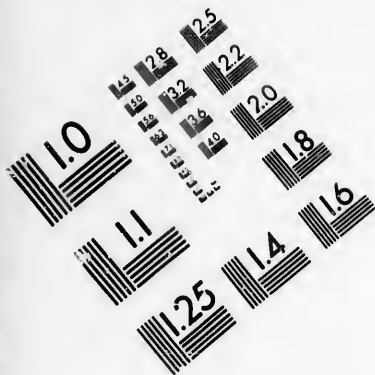
Nancy may undo herself by marrying; for, if Harry is a drunkard, thief, liar, gamester, scold, &c. he may treat her ill, waste her estate, and bring disgrace upon himself and his family.

And perhaps if their professions of religion are different, they may quarrel about the doctrines of original sin, election, reprobation, infant baptism, &c. and like different sectaries, be so puffed up in their vain imaginations, that they will censure each other to the infernal regions, use indecent language before their children and servants, and learn them to follow a bad example.

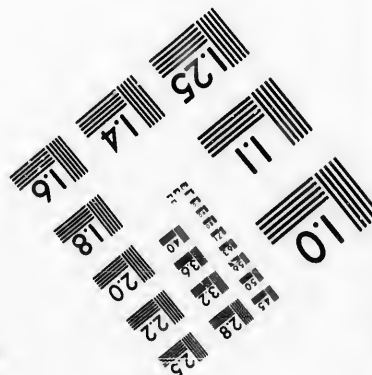
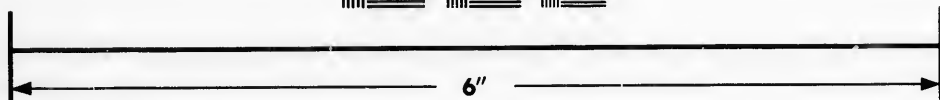
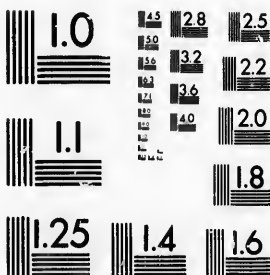
The Catholics may suppose that their principles are right, and that those who dissent from them are heretics:—The Lutherans may suppose that their opinion is best: And the Calvinists may suppose that they are God's elect; and that those that do not think and act as they do, will not go to Heaven. The like may be said of some other sects;

Now





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fects; who, if they are unequally joined in matrimony, may contend about their religious sentiments, and make themselves unhappy. But the philosophers are persuaded, that, in every nation and sect, they that fear God, and work righteousness, will be saved; and they wish that that uncharitableness which so much prevails amongst the different denominations of Christians in the present age, may subside—with all the superstitious notions which they have imbibed from their cradles, concerning their own righteousness, and the unrighteousness of others; and also that charity, humanity, brotherly love, and pure religion, might overspread the globe, as the waters cover the seas.

I have been informed, that a young man, who is a Calvinist, lately visited a young woman called a Universalist, with a design of marrying her. After some time, she found what principle he was of, and that if they married, they should not agree about religion; and for that reason, she carefully warded off the impending danger, by refusing to let him visit her again upon the subject of matrimony.

But although a man and his wife's being of a different sentiment concerning religion, commonly generates strife, yet sometimes such persons have lived happily together. If they are of easy tempers and dispositions, and can consent to let each other enjoy a free liberty of conscience without molestation, they may live in peace as long as life continues.

A young lady, or gentleman, who inclines to get married, should be good-natured, go cleanly dressed,

dressed, refrain from intemperance, idleness, gaming, bad company, bad language, and all kinds of vice. They should be charitable, courteous, kind and humane, obedient to their parents and masters, and, in a word, they ought to walk honestly; for all vicious practices tend to bring them into discredit, and to hinder matrimony.

Sometimes good men have been married to bad women, who have afterwards reformed, and made good wives. And good women have sometimes been married to bad men, who have grown better, and made good husbands.—Sometimes both have appeared to be bad, yet have done well: Again, when both have appeared to be good, they have proved bad after marriage.

A husband ought to be very exemplary in his life and conversation. He should be no liar, thief, or drunkard; not a user of bad language, nor contentious, or covetous; but very kind and humane to his wife, provide well for her in sickness and health, and always remember the words of the Apostle, *that men ought to love their wives as their own bodies*, Eph. v. 28.

A wife ought to be very pious and virtuous, a chaste keeper at home, good and obedient to her own husband. She ought to be no scold, tattler, brawler, or back-biter; but a promoter of peace and harmony, in her family, and amongst her neighbours. She ought to be kind to her husband and family, and to take good care of them both in sickness and health, and to remember the words of King Solomon, *that a virtuous woman is a crown to her husband*, Prov. xii. 4; *And that*

it is better for a man to dwell in the corner of a house-top, than with a brawling woman in a wide house. Prov. xxix. 9.

Parents ought to set good examples before their children; and, according to the advice of the Apostle, to bring them up in the nurture and admonition of the Lord. The same ought to be done to servants.

Both children and servants ought to be kept in some lawful employment, and out of bad company, lest they learn the pollutions that are in the world. But if parents and masters use profane cursing and swearing, their children, &c. will follow the same evil example; for, according to the vulgar saying, "As the old cocks crow, so crow the young ones."

Parents are often to blame for scolding at, and beating their children and servants, when they are not to blame. Those brought up in this way, are the most hard to govern; for where parents and masters are continually fretting, scolding, and striking those under their care, without any apparent cause, they are soon discouraged, and become hardened, so that they will not move when they are bid, without the violence of a blow.—Many of the poor infants have been ruined by being struck on their heads, which has sometimes caused deafness, a loss of sense and sight: therefore, this cruel practice ought to be suppressed.

Children and servants may be spoiled this way, just as a cruel master may spoil a horse that has high life, and is full of good nature; for if he mounts such a horse, and falls to whipping of
him,

him, he may soon wear him out, bring down his spirits, and discourage him so that he will not go at all unless he is beat.

The prejudice of education, and the influence of tradition, has a surprizing effect upon children, and even upon grown persons; for the latter generally (though not always) retain the principles they imbibed in their infancy to their dying day. Hence, if you teach a child that the Heavens and Earth were created by Mahomet, it will retain that belief, unless the voice of Reason shall teach it better—It is therefore necessary, that children should have good principles infilled into them when they are young; for if a child is brought up in the way it should go, when it is old, it will not be apt to depart therefrom.

There are several vanities which have prevailed in some places where I have been acquainted. As,

1. Some parents, who were able, would not help their children when they have come of age. Hence, they have been provoked to anger, and brought into a state of discouragement.

2. Some parents have given near all of their estate to one of their children only, and have turned the rest out naked into the world. This has generated a spirit of envy amongst brethren, and been the cause of much contention and discord.

3. Some have given all their estate to their children, who have become spendthrifts, and thus turned themselves, with their fathers and mothers, out of house and home.

But all these extremes should be carefully guarded against. Parents ought to help their children when it is in their power, and to consider that all must be provided for and supported through life, and that one child is an heir to an estate as well as another; and to remember that he that giveth all his substance to one child, and nothing to the rest, sows discord amongst brethren, which is a thing that the Lord doth hate. Prov. vi. 19.

Again, parents ought to keep enough of their estate in their own hands, to support themselves with as long as life continues.

Children ought to obey their parents, and servants their masters: For it is said, *Honour thy father and mother, that thy days may be long upon the land, &c.*; and, *Children obey your parents in all things, for this is well pleasing to the Lord;* and, *Servants, obey your masters, &c.* He that cursed his father or his mother, was to be put to death under the Mosaical law; and the Apostle, under the Gospel dispensation, mentions the disobedience of parents as a capital crime. Rom. i. 30.

Where children are obedient to their parents, and servants to their masters, a spirit of union and harmony generally exists in families, providing the parents and masters are exemplary in their lives and conversations; but where a disobedience prevails, contention and discord, poverty and distress, frequently ensue.

Children

Children ought to be very kind to their parents in their old age, as well as at all other times, and especially if they have become poor: For, *they that provide not for their own, and especially for those of their own household, have denied the Faith, and are worse than Infidels.*

C H A P. XXXV.

What becomes of the Fuel when it is consumed, the Water when it is boiled away, and the Fire when it is gone out—What produces Fire—How to prevent the Bread from being burnt.—The advantages of the Heat of the Sun—Of the Qualities of the Earth, Air, Fire, and Water.

WHEN the Fuel is consumed, it is all gone off by fumigation into the atmosphere, except the terrestrial parts, or ashes, which are left behind: And the same may be said of the water when it is boiled away; for it is all gone off by evaporation, unless it was impregnated with earthy particles; and they, like the ashes, are left behind.

As to the Fire, it is totally gone off into the air, when the fuel is consumed; where it mixes with the other elements, and thus becomes invisible, until it is put in motion by the violent agitation of different bodies. Hence, the smiting of flint and steel together, will produce visible sparks, which will kindle into a flame, if they have fuel to feed them; and burn till the fuel is consumed, unless it is put out by water, or pent up from the surrounding air.

The fire all flies off into the atmosphere, when it is put out by water; and if a part of burning brimstone

brimstone is covered with a lid, the fire will go out, for it cannot burn where there is a fixed air. About one quarter of the air we breathe in is moveable, and the other part is fixed: the moveable is what causes the fire to burn, and it is also the cause of animal life.

Let an oven be ever so hot, it will not burn the bread, if it is immediately stopped tight; but if the air has an ingress into the oven, the bread will be burnt. Perhaps this information may be serviceable to bakers.

Of the Heat of the Sun.

BY observations it doth now appear,
 The land and sea, with the whole atmosphere,
 Whilst they in their diurnal courses run,
 Do all expand when heated by the Sun.
 Hence, by the heat of our great Sol alone,
 The earth swells larger in the torrid zone,
 Than at the centre of her steady poles,
 Through which her body on an axis rolls:
 The heat expands the globe on ev'ry side;
 But cold condenses, and makes things subside.
 Hence mountains, islands, towns, and cities be,
 With other things upon the land and sea,
 At noon more high than when the sun doth rise,
 Or when he sets in yonder western skies.
 If great Sol's heat did not all things expand,
 On the wide sea, and on the solid land,
 No tides wou'd rise, no murm'ring winds wou'd
 roar:

No waves wou'd dash against the rocky shore;

No thunder-forms, no rain, no hail, no snow,
 No mist, no dew, no mock funs, no rain-bow,
 No northern lights, no vapours wou'd appear,
 Nor clouds condense in all the hemisphere.
 As there'd be nothing but a fixed air,
 'T wou'd make the weather keep exceeding fair.
 No flames wou'd rise, no wood at all wou'd burn,
 Nor any metals into liquids turn.
 All things wou'd die—If you will me believe,
 No animal upon the globe cou'd breathe:
 In solemn silence ev'ry thing wou'd be,
 Upon the land and the extended sea;
 All calm, all dead, not any move at all
 Upon the surface of this earthly ball.

Of the Four Elements.

THE whole terraqueous globe is a composition of earth, air, fire, and water; and all its productions are compositions of the same elements. I shall treat of each of these elements in their order.

I. Of the Earth.

THERE is but one kind of earth, one of air, one of fire, and but one of water; however they may be impregnated by the different substances with which they are combined or mixed.—Hence the earth may be mixed with metallics, the air and fire with different fumigations, and the water with various kinds of particles.

Earth, in a chemical sense, consists in that part which cannot be melted in the fire, nor extended
 by

by a hammer. It is called *caput mortuum*, because it cannot be raised by distillation, nor dissolved by solution; being a thick, dry matter, that is left in the bottom of a still or furnace, after vegetable, metallic, or other operations have been performed.—This kind of earth is not so pure as the other elements.

There are five kinds of mineral earths, three of the vegetable, and as many of the animal.

The Mineral Earths are,

1. The *crystalline*, as flints and crystals; they are friable in a strong fire.
2. The *calcareous*;—a strong fire will convert it into an acrimonious calx.
3. *Argiliaceous*—the purest of clays, boles, and ochres.
4. *Talky*—this is scarcely alterable by a vehement fire,
5. *Gypseous*, English talc, gypsa. A gentle heat will reduce them to a fine powder.

The Vegetable Earths are,

1. That from the burning of soft spongy and farinaceous plants.
2. That from the burning of harder and less succulent plants.
3. That from the burning of wood.

Animal Earths are,

1. That from the burning of shells.
2. That

2. That from the burning of bones, horns, and hoofs.

3. That from the burning of blood, flesh, and skins.

Oyster shells, crabs eyes and claws, red and white coral, pearls, bezoar, chalk, some marles, lime-stones, marbles, and spars, are called *insipid* earths, because they are capable of absorbing acids.

Gold, silver, iron, copper, brass, lead, tin, mercury, antimony, bismuth, zinc, sulphur, salts, rocks, diamonds, precious stones, with all the other mines and metals, are *terrestrial* substances.

Gold is the heaviest of all metals, and tin is the lightest. The former is above nineteen times, and the latter six times heavier than an equal bulk of water.

These earths have an absorbing quality.

II. *Of the Air.*

THE Air is a transparent fluid substance, which environs and compresses the globe on every side. It is subject to expansion by the heat, and to condensation by the cold: Hence, it rises higher in the torrid, than it doth in the frigid zones. Its height, at a medium, is from 45 to 50 miles. It may be compressed into a very small compass, and expanded to a great magnitude, being very elastic and ponderous. Vid. *The cause of the blowing of the winds*, p. 168, &c.

The

The pressure of the air is so very great upon our bodies, that, to every square inch, we bear near 15 pound of avoirdupois weight: Hence, if a man has 12 square feet in his body and limbs, the pressure will be almost equal to 135 tons 1716 pounds weight; which would crush him to atoms, were it not for the equilibrium between the air within him and the surrounding atmosphere.

The air is a part of the composition of all bodies; hence it unites and preserves their parts. It is necessary for the preservation of animal life, and the generation of flame, as I hinted before. Some animals cannot live without it; but toads, vipers, eels, fishes, and all kinds of insects, will live in a receiver, when the air has been exhausted by an air pump.

This element is a fluid, that cannot be converted into a solid by any method hitherto invented. Its particles are so very small, that they cannot be discovered through a microscope, although they are larger than those of fire. Fire pervades glass, oil, water, &c. and will pass through many compact substances; whilst air is resisted by strong paper. The air is the object of taste and of the effluvia to the nose: It is also the vehicle and conductor of sound; for if there was no air; there would be no sound at all.

Although, in reality, there is but one air; yet, by reason of its being impregnated with different qualities, it is called by different names: as,

1. The atmospheric air—This abounds with sulphur, and consists of an acid phlogiston.

2. A fixed

2. A fixed air, formerly called *gas*; but of late has been called artificial, factitious, and mephitic air.

3. An inflammable air—This consists of an acid vapour and phlogiston: it is ten times lighter than the common air, and will take fire like gunpowder, and cause an explosion.

4. A nitrous air—This is generated by the pyrites and other metallics.

5. An acid air—This is obtained from metals with the spirit of salt, or from this spirit without metals.

6. An alkaline air—This is the vapour of volatile alkaline salt.

The common air is combined with all bodies in different proportions, and lies in a fixed state; but when it is let loose by fermentation, putrefaction, or other causes, it resumes its former elastic powers.

The quantities of fixed air in the following bodies have been found as under: *viz.*

In yellow wax	-	$\frac{1}{15}$	} the part of its weight.
course sugar	-	$\frac{1}{10}$	
oyster shells	-	$\frac{1}{6}$	
mustard seed	-	$\frac{1}{6}$	
peafe	-	$\frac{1}{3}$	
tartar	-	$\frac{1}{2}$	
human blood	-	$\frac{1}{45}$	

All kinds of air are capable of becoming fixed; because they may be imbibed in some substance or other, and so become fixed in them.

A fixed

A fixed air is an antiseptic, which powerfully resists putrefaction, and is one and an half heavier than the common air. Water imbibes more than its bulk of this air; flame is extinguished, animals are destroyed, and even the vegetables suffer by its influence.

A heavy air compresses the cutaneous pores, dilates the lungs, and drives the blood to the head, which produces the vertigo, head-ach, pleurisy, peripneumony, and quinsey.

Too light an air produces the gout, rheumatism, spitting of blood, hypochondriac and hysteric complaints, nervous and intermitting disorders, by retarding the circulation of the blood, and diminishing the external resistance to the fluids contained in the pulmonary vessels.

A hot air quickens the circulation, promotes perspiration, enlarges the humours, generates acrimony, and weakens the fibres. Hence, if the air suddenly becomes cold, it produces bilious and other fevers.

A cold air constricts the fibres, distends the lungs, condenses the humours, diminishes the perspiration, and causes external inflammations, quinseys, pleurisies, and peripneumonies.

A dry air causes fevers, by shrinking the solids, and incrassating the fluids.

A moist air relaxes and weakens the constitution, diminishes the perspiration, makes the blood watery, and produces the dropsy, cough, asthma, intermitting and nervous complaints.

A hot, moist air, is very unwholesome; because it relaxes and generates putrefaction: But when it is infected with a malignant miasmata, and other poisonous exhalations, it is very pernicious.

Let all those who may be heated by hot air, be very careful of going into that which is cold, because it may produce dangerous distempers. The fumigations of tobacco and vinegar are very excellent to keep off the noxious qualities of the circumambient air.

III. *Of the Fire.*

FIRE is a pure element, and a part in the composition of all bodies. It may be called the basis of life and motion; for whenever the animal heat ceases, the human body becomes cold, and is a lifeless lump. Hence, fire is the substance of all our motions and senses; for, without it, we cannot see, hear, smell, taste, nor feel any thing. It gives motion to the particles of the air, spring to their actions, and life and vigour to the human frame.

Some substances attract and retain larger proportions of heat than others; and one part of a body will attract and retain more of it than another: hence the red globules of the blood in the human frame, attract and retain a greater degree of heat than any other part.

Animal heat is produced, by the crassamentum of the blood, which attracts and retains a part of the fire which is dispersed through the terraqueous globe.

globe. This fire being thus converged to the blood, makes the fibres become elastic, distends the cells and cellular membranes by rarefaction, begins and continues an action and re-action between the vital heat and the fibres, and causes and supports those motions on which life depends. But the nerves conduct the fire thus attracted to every part of the human frame, and from thence all our fluids become vehicles and conductors.

Hence the nervous system must be first expanded by the heat, and afterwards the other vessels: But whatever increases the crassamentum of the blood, increases the vital heat. Hence animal food, and aromatics, will contribute towards the augmentation of this fire. Many diseases have been called *ignis callidus*, hot fire; such as burning fevers, inflammations, &c.

The common heat in the human body, raises the mercury in Fahrenheit's thermometer to 98 degrees, though some people are healthy when it only rises to 83; and this heat continues the same, let the weather be hot or cold, unless some disease is produced, which raises or depresses the animal heat; but this heat rarely rises higher than 110 degrees, or falls lower than 94.

Fire, though it is a pure element, yet it may be impregnated with particles which consist of different qualities; or rather, the fumigations which arise from it, may be thus impregnated. Hence, when dog-wood or ivy is burnt in America, it will poison those that stand in the smoke.

This element is of great service in chemistry, cookery, and to keep us warm; and in a word,
it

it is a part of our bodies, without which we cannot exist one moment.

IV. *Of the Water.*

WATER, if not impregnated with other particles of matter, is a pure element. But I believe it is always impregnated in a greater or less degree, with particles of different kinds, imbibed from earths, minerals, salts, sulphur, &c. and that even when it comes from the clouds, because such exhalations ascend into the air, and combine with the watery fluid.

The fluidity of water arises from a certain degree of heat; for if the heat is two-thirds less than that of our blood, the water freezes; but if it is made about twice as hot, it boils, and cannot be made any hotter. But it will retain its qualities if it has been boiled or undergone the action of fermentation with other things, as that of brewing, &c.; but though it retains its qualities, it ought to be boiled before it is drank, to kill the animalculæ that may be therein.

This element is subject to elasticity, expansion, and compression; for the heat will expand and make it elastic, and the cold will condense it into a smaller compass, and cause it to become fixed or frozen.

River water is esteemed best for short voyages, and spring water for those that are long; because the latter will not become putrid so soon as the former.—Soft pure water, however, or that which falls from the clouds at a considerable distance
from

from great cities, is esteemed the most healthy and the best for use. It is a great diluter and promoter of digestion.

Springs that proceed from a clean gravelly earth on high land, also afford good water; and water may be purified by distillation, which makes it the purest of all kinds, and it is supposed to be as good as the most celebrated mineral waters.

Let people be careful of drinking water, or any thing cold, when they are hot, lest they die instantaneously.

Stagnant waters are very prejudicial: they abound with a salino-caustic and volatile effluvia which generates putrid and malignant diseases. These waters ought not to be drank either by man or beast.

Water is of great service in navigation, chymistry, cookery, &c. and if that which is good is drank, quenches thirst, cools fevers, promotes digestion, perspiration, urine, &c. and like the other elements, it is a part of our bodies which we cannot live without.

C H A P. XXXVI.

*How to restore People to Life that have been drowned
—The AUTHOR's Observations—How he suffered
Shipwreck.*

IT is said that some have been restored to life and health, that have laid under water six hours.

Let us observe, 1. That when the body is taken out of the water, it should be put into a warm bed, a warm bath, or exposed to the heat of the sun. It should not be rolled on the ground, nor on a barrel, nor taken up by the heels; but removed gently to the bed, bath, or warm sun.

2. Let it be rubbed with coarse cloths, until a glow is perceived in the skin.

3. Let the breath of a healthy strong person be blown into the mouth of the patient, to distend the lungs.

4. Blow the smoke of tobacco in the mouth of the patient.

5. If he was plethoric, bleed him in the jugular vein, if he will not bleed at any other.

6. Tickle his throat with a feather, to excite vomiting.

7. Force nothing down his throat; but apply volatiles, such as spirits of hartshorn, or of sal-ammoniac, to his nose, and also snuff, to excite sneezing.

8. Inject the fumes of tobacco into the intestines with a glyster-pipe, fumigator, or a pair of bellows if nothing else can be had.

9. When

9. When he can swallow, give him a draught of warm water, with a table spoonful of mustard mixed therein.

10. Apply bottles of warm water to his feet, joints and arm-pits, if he is not put into a warm bath; or it may be done after he is taken out; and warm bricks wrapped in cloths may be rubbed up and down his back, and over his body.

11. Wrap the body in a warm skin, just taken from a sheep; also, cloths dipped in brandy, rum, or gin, and the chest, belly, back and arms rubbed with them, may be serviceable; but some rub the body with dry salt, so as not to wear off the skin.

These frictions and other remedies should be repeated as occasion may require; it will perhaps be two hours before any signs of life may appear, and yet the patient may do well.

But a very small quantity of water is swallowed by drowned persons; for they do not attempt to breathe until they become insensible. Hence it is needless to roll them on barrels, or to set them on their heads.

I never had but one patient that was drowned; and after bleeding, rubbing, &c. when his life began to return, he sighed, gaped, twitched, and went into such violent convulsions that it took about four or five men to hold him. As soon as he could swallow, I gave him (as I had nothing else with me) a large dose of Bates's anodyne balsam in some warm water, which allayed the spasms, promoted a diaphoresis, and he soon recovered.

Another man was drowned at the same time ; but he was not taken out of the water till it was too late to attempt to bring him to life.

This accident happened by the overfetting of a small canoe ; and I have often been surpris'd that the practice of making such dangerous things, and the venturing of people's lives in them, has not been suppressed. I was very near losing my life by being overfet in one of them, in the river St. Lawrence, in the province of Quebec.—I once also suffered shipwreck, in consequence of the ill conduct of our Captain, who got drunk, and let the vessel run too near the rocks. At last he fell over-board ; and the sailors, being surpris'd, left the helm in order to save his life. I ran out of the cabin, and seeing nobody at the helm, sprang to it myself. In a moment, however, the stern of the vessel struck, and threw off the rudder ; and the wind being violent, she soon struck again, and bulged, the Captain by this time having got into the vessel. We all jumped overboard, and effected our escape to land. A woman with a child about a year old was with us : I carried the child ashore myself.—Drunken Captains, and drunken sailors, are by no means fit to have the care of vessels.

People that have been hanged, and others that have died suddenly, may sometimes be restored to life in the same manner that those are who have been drowned.

CHAP.

C H A P. XXXVII.

Of the HOT SPRINGS at BATH—Opinions concerning the Cause of their Heat—An Account of the Qualities and Operations of their Waters, with that of other Medicinal Waters in Europe—Of Artificial Baths, and the Mineral and other Waters in America—Poetical Prescriptions for Patients that may go to Saratoga, &c.

THE most remarkable mineral springs that I have seen, are at the famous city of Bath, which is situated about 108 miles westerly of London. This city is built of stone, and is the most beautiful place in the kingdom. Here the nobility and gentry flock in great multitudes, to drink the waters, and bathe themselves. Here are also different baths that have different degrees of heat as from 94 to 116 degrees by Fahrenheit's mercurial thermometer. It is said, that the hottest will boil an egg in four minutes: but there are such conveniences, that the heat may be easily lowered to any degree for bathing, by the addition of cold water.

The time for bathing is from six to nine in the morning, afterwards the water is drawn off into the river Avon, and the baths are filled again with fresh water for use the next morning. The physicians order their patients to bathe in waters of such degrees of heat as their circumstances re-

quire. These waters boil as they come out of the earth; and a great steam arises, which is said to keep off infectious distempers.

Various have been the opinions of Philosophers concerning the cause of this heat.—Some have imputed it to subterraneous fire in the bowels of the earth, whose fumes find vent by throwing out the waters. Others have supposed that the heat proceeds from the waters running over beds of minerals, or being impregnated with the vapours of pyrites, or fire-stones, which contain a large quantity of sulphureous and ferruginous matter.—The latter is probably the true cause; for the mountains from whence the waters proceed, are full of such stones; and if water is poured upon them, it will produce heat by fermentation. But hot springs in general are produced no doubt from various causes, as subterraneous veins of liquid fires, beds of sulphur, and other minerals, which generate heat like the pyrites at Bath.

By analization it has been found, that a Winchester gallon of Bath water contained,

	dwts.	grains.
1. Of calcareous earth combined with a vitriolic acid, in the form of a selenite. - - - -	3	19 $\frac{8}{10}$
2. Of calcareous earth combined with an acidulous gas. - - - -	0	22 $\frac{8}{10}$
3. Of marine salt of magnesia - - - -	0	22 $\frac{2}{10}$
4. Of sea salt. - - - -	1	14 $\frac{4}{10}$
5. Of iron combined with acidulous gas	0	0 $\frac{7}{10}$
6. Of		

6. Of ascidulous gas, twelve ounces by measure.

7. Of atmospheric air, two ounces.

From the combination of the sulphureous gas, feat salt, ferruginous and other qualities, it is that these waters are so very useful in the cure of chronic and other distempers.

Bath waters are attenuating, cleansing, and strengthening. They are friendly to weak constitutions, and beneficial in gouty, scorbutic, and rheumatic complaints; for wandering pains, palsies, convulsions, contractions, bilious cholic, obstructions of the liver and spleen, jaundice, hypochondriac and hysterical disorders, decayed appetite, leprosy, and all other cutaneous eruptions: they comfort the nerves, and warm the body.

They are hurtful in hæmorrhages, inflammations, and infractions of the lungs. When these waters are drank, high-seasoned meats and sauces, with spiritous liquors, must be avoided, because they generate inflammatory disorders. Proper evacuations must precede the use of these waters, and the patients must drink and bathe fasting: not more than two pints ought to be drank in a day.

There are three other hot springs in England: viz. one at Buxton, one at Bristol, and another at Matlock—The first raises the *argentum vivum* in Fahrenheit's thermometer about 80 degrees; the second, about 76; and the third, near 68.

Some impute the virtues of the mineral waters to a quantity of fixed air contained them.

These waters should be drank at the fountain, for their virtues will soon fly off through the nicest sealed cork. The Bath waters hold their heat longer than any other heated to the same degree.

The Buxton waters operate as an alterative, and increase the vital heat: They are esteemed to be serviceable in the gout, rheumatism, dry asthma, convulsions, indigestion, loss of appetite, contractions of the tendons, and catamenial defections.—Buxton is in Derbyshire, about 159 miles from London.

Bristol waters are impregnated with lime, and abound with a soft alkaline quality. They are a specific in coughs, consumptions, spitting of blood, dysentary, diabetes, inflammations, scurvy, ulcerations, spasms, and acrimonious humours.—Bristol is 120 miles westerly from London.

Matlock waters are slightly impregnated with selenites, or some other earthy salt; and have the same virtues as the waters at Bristol.—Matlock is in Derbyshire, 104 miles from London.

All mineral waters participate in a greater or less degree, of earthy, salineous, sulphureous, and other matters over which they run in their subterraneous passages. Hence their virtues are various, according to the different qualities of the matter with which they are impregnated.

There is a spring near Wales in England, that throws matter out of it, which resembles tar—supposed to be occasioned by subterraneous fires, and the consumption of coal-mines.

Besides

Besides the preceding springs in Great-Britain, there are, 1. Alkaline waters at Upminster, Brentwood, Weal, Selter, and Tilbury; the latter is the strongest. It is good in acidities, crudities, alvine fluxes, and other disorders from a debility of the fibres. A quart may be drank in a day.

2. The bitter purging waters at Northaw, Brant, Alford, Colchester, Lambeth, and Dulwich. A patient may drink from one to three pounds in a day as a purge; but it must be taken in a less quantity as an alterative—a little brandy or aromatic tincture is recommended to prevent their griping. They may be mixed with milk, whey, wine, &c. and used as common drink in such quantities as to keep the body lax.

3. Steel waters are those of Pyrmont, Spa, Tunbridge, Hampstead, Islington, Hartfell, &c. all of which are in England. The first and the third are esteemed best for medical use. They have the virtues of iron and steel, which are alike. They open, corroborate, and astringe: Hence, they are good for weak, lax, pale, leucophlegmatic habits. They encrease the vital heat, raise the pulse, strengthen the stomach, and invigorate the whole system. They promote deficient, and restrain redundant discharges. From one to three pints of this water may be drank in a day.

4. The principal hot waters in Europe, are, those of Bath, Aix-la-Chapelle, in France, and Bourbon in Germany. Germany is said to contain more mineral waters than all Europe besides.

Some

Some of them are so hot, that the patients let the waters cool ten or twelve hours before they are used. The bath and medicinal waters at Embs, Wisbaden, Schwalbach, Willdungen, and those in many other places, are said to perform wonders in the cure of internal and external diseases. Those of Dungen, are said to intoxicate as much as wine; and for that reason they are inclosed, so that people cannot come at them without permission, otherwise they might drink too freely.

The waters at Aix-la-Chapelle are strongly impregnated with sulphur: they are very nauseous, and their purgative quality is so great that but few can bear it.

There are other remarkable springs in France; as,—1. One at Baresges, whose waters are esteemed the best in that kingdom for the cure of diseases—

2. One at Sultzbach, whose waters are good for the stone, palsy, and a weakness of the nervous system—3. Several at Bagueus, whose waters are esteemed beneficial in the cure of diseases—4. At the Forges, in Normandy, are celebrated mineral waters—5. One at St. Amand, whose waters open obstructions, and cure the gravel—6. One at Aigne, whose waters are so poisonous, that they kills birds that drink of it instantaneously.

5. It is said, that the water of the River of Thames, which runs through London, will burn like spirits after it has been at sea about 18 or 20 months, and that some other waters will do the like; but how to account for this, I know not, unless it

abounds

abounds with an oil or spirit that rises on the top, and becomes inflammable by the motion of the sea in long voyages. Perhaps the constant friction may cause the water to imbibe something from the cask, that may make it inflammable.

6. Sea water has different degrees of saltness: The proportion is from $\frac{1}{3}$ to $\frac{1}{6}$ of the weight of the water. This water is the saltest at the equinoctial, and freshest towards the polar regions: Hence 20lb. of water in the torrid zone, will yield 1lb. of salt; and 50lb. in the frigid zones, will yield the same quantity: and in the intermediate latitudes, the quantity increases and decreases in proportion as we advance towards, or go from the equator.

Sea-water is discutient, corroborant, and antiseptic. It purges gently, promotes the secretions, warms and strengthens the body, and is good in swellings, carious bones, and as a vermifuge. It prevents the falling off of the hair after patients have been ill of fevers, if the head is bathed therewith.— It is also esteemed beneficial in the bite of a mad dog, if the patient is plunged often in it: it is also good for those that are melancholy, and affected with madness. But it is hurtful in inflammations.—The dose is from half a pound, to one and an half in the morning.

Besides the natural, perhaps it may not be amiss to say something concerning the virtues of the artificial baths, which may be either cold or hot.— These are performed at a bath, or in vessels made for that purpose, such as bathing-tubs, &c. which should

should be made so large that the patients may sit or stand in them, as their circumstances may require.

Of these baths there are three kinds; as,

1. The *pediluvia*, or bath for the feet:
2. The *semicupium*, or half-bath, which reaches no higher than the umbilical region.
3. *Balneum totum*, or total immersion.

The water used for warm artificial bathing should be of the softest kind; that of rain is the best; that of melted snow is the next for softness, and that of a river the next, &c.; but where soft water cannot be had, that which is hard may be softened with castile-soap, milk, wheat-bran, camomile flowers, marsh-mallows, or white lily-roots, as either of these will make it soft.

The *pediluvia callida*, or warm bathing of the feet, promotes the circulation of the fluids; makes a revulsion from the head and vital parts; raises the pulse, and creates a temporary fever. It is of great service in colds, spasms, head-achs, recent, obstructions, fixed and wandering pains, pleurisies, peripneumonies, convulsions, cholick, hæmorrhoids, hypochondriac and hysteric complaints, menstrual obstructions, gout, rheumatism, caridalgia, and an obstructed perspiration: it promotes a diaphoresis, rest, and sleep; the water should not be too warm, because it will make the patient faint, weak and thirsty, and pains will be excited in his head. The feet and legs may be immersed as high as the calves; and the patient should drink a warm infusion

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sion of camomile-flowers, keep his feet in the water about half an hour, and then go into a warm bed.

The *pediluvia* is hurtful in inveterate obstructions and schirrous tumours; and it is dangerous to drink any thing cold whilst the feet are in, or soon after they come out of the water.

The *pediluvia frigida*, or cold bathing of the feet, raises pleasing sensations in the mind, and assists cathartics and diuretics in their operation: Hence it is of great service in the iliac passion, as it tends to produce those evacuations which are necessary to eradicate the disorder.—The going with one's feet wet and cold, will often occasion a diarrhœa.

The *semicupium*, or warm bath, assists other remedies in the cure of grievous complaints; and so does a total immersion, though it is best for the patient to sit with his head above the water. In most disorders, however, I prefer the *semicupium* and the *pediluvia* to that of a total immersion.—Warm bathing is excellent in venereal complaints, and especially when the taint has become universal. Patients afflicted with cancers, have found great relief from it.

Cold bathing is the most useful when a violent shock is required; but proper evacuations ought to precede the use of it. It contracts the solids, condenses the fluids, and accelerates their circulation. It is beneficial when the body requires bracing. Sometimes it is of great service in the rheumatism, palsy, melancholy, and madness, and
for

for children who have the rickets; but none ought to make use of it, without the advice of a skilful physician.

The North American Indians make use of a vapour bath, by shutting themselves up in a small tight room, and by throwing hot stones into a pail of water. When they have thus sweated for some time, they plunge themselves into cold water, and go immediately into the vapour bath again. This mode of practice is very beneficial in the cure of recent distempers.

Both the warm and cold baths ought to be used upon an empty stomach: but when the fibres are rigid, and the *viscera* unbound, cold bathing is improper.

But let us return to the *mineral waters*.—There are a number of such springs in America, whose waters are impregnated with different qualities.

At Lancaster, in the county of Worcester, in the commonwealth of Massachusetts, there is a spring whose waters are beneficial in rheumatic complaints, as I have found by my own experience and observation. The patient may drink half a pint two or three times in a day, and plunge himself once when his stomach is empty. He should come out of the water immediately, and keep himself warm after the immersion.

At Stafford, in Connecticut, there is a mineral spring whose waters are said to be beneficial in scorbutic complaints, cutaneous eruptions, and other disorders: And, at Guildford, in the same government

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government, there is another spring, whose waters will evaporate, even when tightly corked in a bottle; but I know not their virtues.

In the easterly part of the county of Albany, in the State of New-York, there is a mineral-spring whose waters are much applauded in the cure of distempers. But the most remarkable springs in this State, are those of Saratoga, which are eight or nine in number: They are situated in the margin of a marsh, and surrounded by rocks formed by the petrefaction of the waters. One of them is about five or six feet above the surface of the earth, and is in the ^{shape} of a pyramid. In the top of this rock there is a cylindrical aperture, about nine inches in diameter, through which the water issues, being always greatly agitated as if boiling in a pot, although it is very cold. The water runs over the top of the rock in the beginning of the summer, but at other seasons it rises not so high by twelve inches. The rocks that encompass the other springs, are of different forms; but the waters seem to boil, and they run continually.

It is supposed that all these springs proceed from one fountain, but separate in different canals, whereby some have greater connections with metallic bodies than others.

They are impregnated, 1. With a fossile acid—
2. A saline substance—3. A chalybeate property—
4. A calcareous earth—and, 5. With a prodigious quantity of air.

This

This air, striving for vent, produces fermentation; and it is so penetrating, that it cannot be confined in a tight vessel: Hence it must be drank at the spring, or it will lose its virtue.

The particles of dissolved earth subside as these waters run off, and, combining with the salts and fixed air, concrete, and form the rocks about the springs.

By observation it has been found, 1. That if a young turkey is held within a few inches of the surface of the water, at the lower spring, it will be thrown into convulsions in less than half a minute.

2. That the holding of it in such a situation one minute, will make it become motionless.

3. That it will throw a dog into convulsions in less than a minute.

4. That if a trout is thrown into a vessel of this water, when just taken from the spring, it will go immediately into convulsions, and expire in a few minutes.

5. That if a lighted candle is held near the surface of this water, it will suddenly go out, and the fire in the wick will be extinguished instantaneously.

6. That if a bottle filled with this water is closely corked, and afterwards shaken, the airy matter will expand, force out the cork, or split the bottle.

7. That wheat-flour mixed with this water, and kneaded into dough, and then baked, makes light and spongy bread, without the addition of yeast or leaven.

8. That

8. That when the air is gone off by evaporation, the water loses its transparency, and lets fall a calcareous sediment.

9. That if a piece of the rock that environs the spring is put into the fire, it will calcine into quick-lime, which may be slacked with cold water.—Hence we may conclude, that the waters are impregnated with lime-stone, and that the gas is an aërial acid, which makes the water capable of dissolving and conveying the stones above the surface of the earth.

These waters are emetic, cathartic, and diuretic in general; but they have different effects in different constitutions. They have an agreeable taste whilst the patient is drinking, but soon after they produce one that is disagreeable.

A gentleman of the faculty who lived near these springs, informed me, that a patient may drink a gallon of the waters in a day, with safety; and that they are excellent in scrophulous, rheumatic, and other complaints.

In the upper part of Morris County, in the Jerseys, there is a cold mineral spring, whose waters are used with success in the cure of some diseases.

On a ridge of hills in Hanover, in the same county, there are a number of wells; and although they are about forty miles from the sea, they ebb and flow near six feet, twice every day, as regular as the ocean.

In the county of Cape May, there is a fresh spring that boils up through the bottom of a salt-water creek. The tide rises about four feet above this spring; and if a bottle well corked is let down

through the salt-water into the spring, and the cork pulled out with a cord prepared for that purpose, the bottle may be drawn up full of fine fresh water. There are other springs of the like kind in different parts of the State.—In the county of Hunterdon in the Jerseys, there is a noted mineral spring, whose waters are esteemed excellent. They are of the chalybeate kind.—It is said, that there is a river, called Mill-stone, in the Jerseys, whose waters in some places emit an inflammable vapour, that will take fire, and burn for a short time. This vapour is supposed to be produced by the dissolution of vegetable substances in the river.

At Augusta, in Virginia, there are two springs, one of which is called the warm spring, and the other the hot. The heat of the warm spring rises to 96 degrees by Farenheit's mercurial thermometer. This water is impregnated with sulphureous particles; it is very volatile, and esteemed good in rheumatic complaints and other disorders.—The hot spring is about six miles from the warm spring. It raises the mercury in the aforementioned thermometer to a fever heat, *viz.* 112 degrees. This water is esteemed good in many complaints, and frequently relieves when the water of the other spring fails.

There are hot springs at Kamschatka, which raise the mercury to about 200 degrees, which is within 12 degrees of the boiling point. These springs are much used for medical purposes.

In Botetourt, there are sweet springs, whose waters are cold. They have granted relief when other mineral waters have failed.

In

In the county of Berkeley, there are mineral springs which are much used; but their waters are scarcely warm, and not very powerful.

In the county of Louisa, there are medicinal springs; but their waters are not much used.

In Richmond there is a spring of the chalybeate kind, and some others in various parts of the county.

There is a sulphureous spring at Howard's creek of green briar, and another at Bonborough on Kentucky.

At Great Kanaway, seven miles above the mouth of Elk river, and sixty-seven above that of the Kanaway itself, is a hole in the earth, from which issues a bituminous vapour, with such rapidity that it makes the sand move about its orifice like the sand in a boiling spring. This vapour will take fire if a torch or lighted candle is put within eighteen inches of the hole, and flame up in a column of eighteen inches in diameter, and four or five feet high. Sometimes it goes out in about one-third of an hour; at other times, it will burn three or four days. The density of the flame is like that of burning spirits, and the smell like that of burning pit-coal. Sometimes cold water is collected in the mouth of this hole, and is kept in ebullition by the force of the vapour which issues through it. If the vapour is fixed in that state, the whole of the water is soon evaporated.—There is a similar vapour on Sandy River.

There are five noted salt springs in Kentucky, whose waters are saltier than that of the ocean. The people in that country have been supplied

with salt made from those waters, for three dollars and one-third *per* bushel.

There is a mineral spring in the county of Wilkes, in the State of Georgia, which issues out of a hollow tree about four or five feet above the surface of the earth. The inside of the tree is lined with a coat of nitre about an inch thick; and the leaves above the spring are incrustated with a nitrous coat, which is as white as snow. This water is excellent in gouty and rheumatic complaints, and for scrophulous and scorbutic disorders; also in consumptions, and other maladies. The patient may drink from one to two quarts in a day.

A gentleman informed me, that he had seen a hot spring in the West Indies, whose waters issued, boiling hot, out of a burning mountain; but he did not tell what their virtues are.

I shall conclude this chapter with the following prescriptions for patients going to the medicinal waters at Saratoga; and perhaps they may be beneficial to those who may be inclined to go to other cold springs.

1.

IF, Sister Spleen, you want a *cure*,
At Saratog' a place procure;
With a warm lodging, and a bed,
Where you in peace may rest your head.

2.

There eat and drink, discourse and play,
And drive all anxious thoughts away;
And frequently, when you've a chance
To hear good music, up and dance.

3. Go

3.

Go in the morning to the rock,
And there let nature have a shock,
By plunging whilst the air is cool,
Into the wholesome wat'ry pool.

4.

But at the fountain, mind, and think
Before you plunge, to take a drink :
Bathe not too long—but soon come out,
Put on your cloaths, and walk about.

5.

And when you thus have took the air,
Unto your house again repair ;
Drink coffee, chocolate, or tea,
Or such things as best suiteth thee.

6.

Use gentle exercise—peruse
For a short time the latest news ;
Remark the things that you may find,
Exceeding pleasing to your mind :

7.

Not caring who it is that rules,
Providing no rebellious tools
Deprive the country of its peace,
And make your own therein decrease.

8.

Then if the weather's warm and fair,
Before you dine, walk in the air ;

X 3

Or

Or if you have a prudent guide,
Go to a coach, and take a ride.

9.

Or if a gentle horse you chuse,
To ride him oft do not refuse;
Don't exercise beyond your pow'rs,
But eat and sleep at proper hours.

10.

Go see your friends as you ride round,
Where peace, where mirth, and joy abound;
In good discourse divert your mind
With those who are polite and kind.

11.

In food that's nourishing and light,
No doubt you'll take the most delight;
And whilst you on the stage remain,
From all intemp'rance pray refrain.

12.

High-season'd food you'll not digest;
It will deprive you of your rest:
In wines and sauces don't exceed;
Excess therein distempers breed.

13.

Eat food, then, of the lightest kind,
And undisturbed keep your mind:
Digestion's work is easiest wrought,
By cheerful chat, and little thought.

14. To

14.

To church on Sunday go you may,
To hear the word, to sing and pray ;
And when the exercise is o'er,
Return to where you lodg'd before.

15.

Refresh yourself, and, when you please,
Lie on the bed, and take your ease :
If you be young, or if you're old,
Be careful that ye take no cold.

16.

At night before you go to bed,
If vapours do affect your head,
Go bathe your feet, it may be best
In a warm bath—'twill make you rest.

17.

When men skill'd in the medic art
Their good advice to you impart,
Then see that ye do not neglect
To take the things which they direct.

18.

Go neatly drefs'd, but not too gay ;
Drive restless thoughts and cares away :
Pursue these rules—wait the event,
And with your station be content.

19.

Then I doubt not but soon you'll find
Relief according to your mind ;

X 4

That

That you'll get rid of all your pain,
Your health and strength return again.

20.

I hope you will, with much delight,
Do ev'ry thing that's good and right ;
That when you die, you *will be blest'd*
With *glory, honour, peace, and rest.*

Composed by the *Author*, at Kentish-town,
Feb. 26, 1790.

CHAP.

C H A P. XXXVIII.

The Widow's Address to the Gentlemen—The Author fights with a Swarm of Fleas, who obtain a Victory over him—How to keep a House clear of those disagreeable Animals.

A LADY who had lost her husband, and had refused to marry again, requested that I would favour her with some of my Poetry. I therefore composed the following :

1.

YE *Gentlemen*, pray now attend
To one that's in distress :
To one who wants a loving friend,
In this world's wilderness.

2.

My husband died some time ago ;
His fortune was not small :
I have been courted, but cry'd, *No!*
I'll marry not at all.

3.

But now, behold ! I've *chang'd* my mind,
And *sing* another tone ;
Because it is not *good*, I find,
For me to *live alone*.

4. A man

4.

A man that's very young, or old ;
 A gamester, or a sot ;
 A stingy fool, or fretting scold,
 I know, will suit me not.

5.

I want a man replete with sense,
 Whose manners are refin'd ;
 Whose temper's sweet as innocence,
 And all his actions kind.

6.

With such an one I'd live in peace,
 Make him a prudent wife ;
 Until his time or mine shall cease,
 We'd live a happy life.

7.

Let such a man upon the stage,
 A visit pay to me ;
 And if he likes me, I'll engage
 That married we shall be.

8.

Remember that I've *chang'd* my mind,
 And *sing* another tone ;
 Because it is not *good*, I find,
 For me to *live alone*.

Jan. 19, 1790.

When I was in the city of Quebec, a gentleman invited me to pay him a visit, which I accordingly did. Just after I had got to his house, his wife was violently seized with convulsions ; and at his request, I administered remedies which granted relief.

relief. I tarried with them near two days, and was very well entertained. At his request, I visited him again about two months after; but a swarm of fleas had taken possession of the house, which prevented my getting to sleep till near day. I dreamed I was making poetical lines on the subject, and therefore wrote the following :

ONE evening fair I took a walk,
 To hear some genteel people talk;
 Who in me had so much delight,
 They made me tarry through the night,
 As time roll'd off, we did converse
 On subjects I shall not rehearse,
 Until at length we laid our heads
 To rest upon the downy beds.
 But, lo! an hungry swarm of fleas
 Crawl'd on my legs, and on my knees;
 Nay, some of them did soon arise
 Most rapidly above my eyes:
 So nimbly on me they did creep,
 By no means cou'd I go to sleep:
 They crawl'd, they jump'd, and grew so bold,
 That of my flesh they did take hold;
 Which put me into such a rage,
 That I in war did soon engage.
 I knock'd them all both to and fro,
 But from me far they won'd not go.
 I found my strokes upon the bed
 By no means struck the creatures dead,
 Though I drove them from place to place,
 They boldly jump'd into my face,
 And bit me from my very nose
 Down to the ends of all my toes;
 Which constantly did make me start,
 Like one prick'd with a piercing dart.
 Whilst through the dark and silent night,
 I was oblig'd to lie and fight;

I kick'd,

I kick'd, I scratch'd, I rolled round,
 And often on my foes did pound.
 My labour prov'd so much in vain,
 A vict'ry I could not obtain:
 When it was day, I had to yield,
 And wholly quit the irksome field.
 Though much fatigu'd, I look'd, and found
 My flesh most sorely they did wound:
 On me extended very wide,
 Their venom was on ev'ry side.

When I was up, the Lady said,
 The fleas bit you, I am afraid!
 They are so thick, I'm almost craz'd,
 And honestly like one amaz'd.
 She said, the lads, to keep from harm,
 Had lodg'd that night within the barn.
 By what I heard, I truly found
 The fleas from them had took the ground.

Is it not strange, a nest of fleas
 Shou'd do such mighty things as these!
 Make men of might in battle yield,
 And wholly take from them the field!

Now, to the world, I will point out
 A method that, without all doubt,
 Will make our foes so much decrease,
 That we may live and sleep in peace;
 I therefore will proceed to shew
 How we may kill this dreadful crew:

With boiling water scald the floors;
 Keep clean the ground around the doors;
 And from the house the cats and dogs,
 The goats and cattle, sheep and hogs:
 Then the tormenting jaws of fleas,
 Will not prevent our sleep and ease.

Composed at Quebec, in 1788,

Bed-bugs

Bed-bugs are another disagreeable vermin, which I cannot endure. They are very numerous and troublesome in some old houses in America, that are chiefly made of oak. Some say, that they will not live in a bed-stead that has been painted with verdigrease, and that the spirits or oil of turpentine will keep them off. And some use the *ung. ceruel.* for the same purpose. Cold water, and salt and water, are also used to kill bugs.

Lice and crabs may be destroyed as follows:—Go to the apothecary, and buy Aq. rosar. 4 oz. —Merc. crof. sublimat. 1 scr. m. f. lotio.—Or, ung. simp. 2 oz.—Merc. præcip. alb. 1 scr. *misc.* —But some apply the *ung. ceruel. mit.*—Let a physician, or an apothecary, tell how much you ought to apply at one time.

It has been said that boiling water will not kill lice; and that if a lousy garment is wet, and exposed to the frost, the lice will die.

The stings and bites of hornets, wasps, bees, and bugs, may be cured with oil, honey, and vinegar, applied *pro re nata.*

In some places, the flies, gnats, and moschettoes are very troublesome. Some drive them out of their houses by fumigations, and explosions of gunpowder. Emollient fomentations, and cataplasms with oil mixed with theriaca, are good in all bites and stings. Milk and oil, both internally and externally, are excellent remedies in all poisons that produce inflammations.

C H A P. XXXIX.

Of a Battle between a Toad and a Spider—Of the Death of a Man bit by a Spider—Of a Patient who lost his Senses by swallowing a Spider—Of the Death of a Family by the Poison of a Lizard—Of Poison Fish—And how Two Women were burnt to Death in consequence of their drinking to Excess.

A TOAD was seen to fight with a spider in Rhode-Island; and when the former was bit, it hopped to a plantain leaf, bit off a piece, and then engaged with the spider again. After this had been repeated fundry times, a spectator pulled up the plantain, and put it out of the way. The toad, on being bit again, jumped to where the plantain had stood; and as it was not to be found, she hopped round several times, turned over on her back, swelled up, and died immediately.—This is an evident demonstration that the juice of plantain is an antidote against the bites of those venomous insects.

We have different kinds of spiders in America, all of which have a greater or less degree of poison, though some people have been otherwise minded. The largest sort, which are of a greenish colour, are the most venomous.

At

At the high lands on Hudson's river, in the State of New-York, in the year 1780, a Mr. Thomas Nelson, who belonged to the Continental Army, was bit by a green spider, in a vein just above his fore-finger. The part first itched, then smarted, ached, and swelled to his arm-pit; from thence the swelling ran to the middle of his breast, and, in about twelve hours from the time he was bit, he expired. This I received from a Captain Hubbal, who commanded the company that Nelson belonged to.

A learned physician in the Massachusetts, with whom I was acquainted, visited a patient who was violently seized with a delirium. An emetic was exhibited—a large spider was vomited up, and the patient's senses were soon restored. He recollected, that as he was drinking some water in the dark, on the preceding evening, he swallowed something, which he supposed to be the spider.

A cook-maid in Virginia, accidentally boiled a lizard in the head of a cabbage: the poison proved mortal, for it killed her, and all the rest of the family.

Fish that live upon beds of copper-mines, are poisonous. The way to know whether they are so or not, is to boil a silver spoon with them; and if it comes out bright, the fish is not poison; but if it is coloured, they are by no means fit to be eaten. In the year 1789, a man died at New-York, by eating a piece of a dolphin, said to be impregnated with such *virus*.

A woman who lived in the practice of drinking a quart or more of brandy in a day at New-York,
became

became so impregnated with that inflammable spirit, that she took fire when she was alone in the night, and was found the next morning almost consumed. It was supposed that the fire was communicated from a candle to her breath, and from thence conveyed to her internal parts. The room was covered with a blackish smut; but the floor on which she lay was not burnt. It was suggested, that the fat that ran from her body prevented the floor from taking fire; but perhaps the tightness of the room, and the separation of the watery particles from the inflammable, might be the cause thereof.

Another woman, who lived on Long-Island, near New-York, followed the practice of drinking rum to excess, till she took fire by the flame of a candle, in the presence of her friends. They soon extinguished the flame; but her insides were so much burnt, that she died in a short time. This account was communicated to me by the physician who was called in when the accident happened.

C H A P. XL.

Of the Rattle-snakes, Black Snakes, Vipers, and Mad Dogs—How to cure their Bites.

I. *Of the RATTLE-SNAKE.*

THESE reptiles have been very numerous in some parts of America; but their number has greatly decreased of late, by reason of the rapid increase of the English and other settlements. Their bites are very poisonous, and sometimes prove mortal; but their flesh is supposed to be good in consumptions, though I have not seen any good effects from its use. The oil is the most penetrating and relaxing of all animal oils, and is esteemed excellent for quinseys, stiff joints, corns, &c.

The bite of a rattle-snake may be cured by the juice of the roots and branches of plantain and horehound, forced down the patient's throat, if it cannot be taken otherwise. A large spoonful is a dose. If one dose does not relieve the patient, in an hour, give another, and repeat it as occasion may require. If the herbs are dry, moisten them with a little water before they are bruised in a mortar: a leaf of tobacco, steeped in rum, may be applied to the wound.

Y

Seneka,

Seneka, or rattle-snake root, is said to be a specific against the poison of these reptiles. The powder of the root, or the fresh root, may be applied as a cataplasin to the wound; and the patient may take from a scruple to a drachm of the powder in substance; or three ounces of the root may be boiled in water enough to make a pint of decoction, of which the dose is from two to four spoonfuls, three or four times in a day.

A decoction and poultice of blood-root is also beneficial in the bites of these serpents; but the plantain and horehound is supposed to be the best remedy.

A Captain Hastings informed me, that he provoked a rattle-snake to bite a piece of elm-bark in three different places. From the first place that was bitten, the poison extended itself about 18 inches each way, and was of a deep green colour: from the second place, it ran about 9 inches; and in the third, he could scarcely discern any colour at all. Hence he concluded, that the poison of the serpent was almost entirely exhausted by the two first bites.

II. *Of the* BLACK SNAKE.

BESIDES the rattle-snake, there is one of a black kind in America; but I have not heard of their biting any person. But they are very dangerous; for sometimes they get round people's necks, and sometimes round their waists, and draw themselves tighter and tighter 'till the people expire. It has been said, that an Indian woman,
who

who had killed some young snakes of this kind, lost her life in that manner by an old one.

A very remarkable instance happened in the county of Worcester, in the commonwealth of Massachusetts, since the commencement of the late war.—A boy dreamed several nights running, that he was killed as he was going after the cows, at a certain place, by a black snake; and told his master and mistress of his dreams, and that he was afraid to go after the cattle. At last he grew so timorous, that he actually refused to go at all unless he could have company; but his master flogged him, and sent him off. The next morning the poor boy was found dead at the place he had mentioned, with a large black snake round his waist.

These serpents will climb trees, to get birds eggs; and both they and the rattle-snake often charm birds into their mouths.

When a black snake gets round a person, 'tis best to cut it in two. Hence the necessity of travelling with a pen-knife; for whether they are round a person's neck or waist, they draw themselves tighter and tighter as he fetches his breath, and at last put an end to life.

Cure for the BITE of a VIPER.

WARM common fallad-oil, and rub it well into the part that has been bitten. This is said to complete the cure, if repeated *pro re nata*.

*Names of the different Snakes or Reptiles in the
United States of America.*

- | | |
|------------------------|----------------------------|
| 1 The rattle-snake | 16 Green rattle-snake |
| 2 Small ditto | 17 Wampam ditto |
| 3 Yellow ditto | 18 Glafs ditto |
| 4 Copper-bellied snake | 19 Bead ditto |
| 5 Bluish green ditto | 20 Striped or garter ditto |
| 6 Black ditto | 21 Water ditto |
| 7 Ribbon ditto | 22 Hissing ditto |
| 8 Spotted ribbon ditto | 23 Thorn-tailed ditto |
| 9 Chain ditto | 24 Speckled ditto |
| 10 Joint ditto | 25 Ring ditto |
| 11 Green spotted ditto | 26 Two-headed ditto |
| 12 Coach-whip ditto | 27 Wallor-house adder |
| 13 Corn ditto | 28 Water viper |
| 14 Hog-nose ditto | 29 Black ditto |
| 15 House ditto | 30 Brown ditto. |

The toad is also called a reptile.

The thorn-tail snake is of a middling size, and very venomous. It has a thorn in its tail, with which it sometimes stings those that come near it.

The skin of the joint-snake is as smooth as glass, and so hard that it will break to pieces like the tube of a pipe. It has so few joints, and is so stiff, that it cannot easily bend itself into the form of a hoop.

Two-headed snakes are very scarce, and perhaps of a monstrous kind, though it has not as yet been determined whether they are so or not.

There are more snakes in the southern than in the northern governments, for they love hot climates best.

The remedies I have prescribed, are esteemed good for the bites of all such kinds of reptiles.

Of

Of the Signs of Madness in a Dog.

THE signs of madness in a dog, are,

1. A dull, heavy look ;
2. His trying to hide himself ;
3. His seldom or ever barking ;
4. His being angry with, and snarling at strangers ;
5. His fawning and leaping at his owner ;
6. His refusing to eat or drink ;
7. His drooping, hanging down his head, ears, and tail ;
8. His often lying down as if going to sleep—
This is called the first stage of madness.
9. His breathing quick and heavy ;
10. His running out his tongue, slavering and frothing at the mouth ;
11. His appearing to be half-asleep ;
12. His flying at the by-standers ;
13. His running forward in a curved line ;
14. His not knowing his master ;
15. His eyes watering as they grow thick and dim ;
16. His tongue being of a leaden colour ;
17. His growing faint, weak, falling down, rising up and attempting to fly at something—
This is the last stage of madness, and the dog commonly dies in less than 30 hours.
18. The higher the madness is, the more dangerous are the bites.
19. When a dog is mad, all other dogs, upon smelling him, run off with horror.

Symptoms consequent on the Bite of a Mad Dog.

The symptoms consequent upon the bite of a mad dog, are,

1. A pain in the part bitten ;
2. The gradual approach of wandering pains ;
3. An uneasiness and heaviness, with disturbed sleep and frightful dreams ;
4. A tossing of the body, sudden startings, spasms, &c.
5. A sighing, solitude, and anxiety ;
6. Shooting pains from the wound to the throat ;
7. A straitness, and sensation of choaking ;
8. A horror and dread at the sight of water and other liquors ;
9. A trembling, and loss of appetite ;
10. A starting back when any fluid touches their lips, attended with great agony and fury ;
11. A nausea, and vomiting of bilious matter ;
12. A continual watching, dryness and roughness of the tongue, with a high fever ;
13. A thirstiness and hoarseness, with a lolling of the tongue out of the mouth ;
14. An attempting to spit at the by-standers, and to bite those they can come at ;
15. A raging and foaming at the mouth ;
16. An aversion to the sight of a dog, and to a person dressed in scarlet ;
17. A barking like a dog, sinking of the pulse, failure of breathing, followed by cold clammy sweats, convulsions, and death.

A Hydro-

A *Hydrophobia* is a nervous disorder, attended with inflammatory symptoms. There are two kinds, *viz.* a *hydrophobia rabiosa*, or a desire of biting; and a *hydrophobia simplex*, or no desire of biting. Some patients grow dumb, others rave with madness; and sometimes the madness is periodical.

The smallest quantity of the *saliva* of a mad dog, either fresh or dry, may produce this distemper. The poison generally operates in three or four weeks; but sometimes it lies dormant many months. The infection is communicated to the human race by the *saliva* only; but dogs have received it by going into kennels where mad dogs have been before.

When a patient is bitten by a mad dog, let the wound be immediately dilated, or entirely cut out; and the poison extracted by a cupping-glass, with scarifications, or by drawing cataplasms: perhaps a poultice of onions, often applied, might be of great utility, and also epispastics.

Some cauterize the wound, after it is scarified:—but I cannot see wherein that can be beneficial; for the parts being seared, must become callous in some degree, and obstruct a discharge of the *virus*.

The frequent washing the wound with salt-water and vinegar, and keeping it open by escharotics, has been recommended; but, do not these remedies contract the parts, and shut in the poison?

It is said, that the Americans have poured cold fresh water from a tea-kettle upon the part bit

by a mad dog, and continued it a long time, and that it has been serviceable in carrying off the poison: but it is my opinion, that warm water would do better; because the cold condenses, and the heat relaxes the parts, and may open a way for the *virus* to make its escape.

Hence may we not conclude, that the dilating of the wound, washing frequently in warm water, the application of a cupping-glass with scarifications, and of attractive fomentations and cataplasms, must be of greater utility than those things that cicatrize, contract, and condense the parts, and hinder the poison from escaping at the place where it was imbibed?

The frequent use of the cold bath is esteemed advantageous in the canine madness.

When the poison has extended itself through the whole mass of the fluids, the cure must be attempted by such things as will prevent or destroy the nervous or spasmodic irritation, or, by a specific property, destroy the acrimony that generates the disorder.

Hence, if there is an inflammation, or a *plethora*, bleed, and give *Gm. Opii*. gr. j. *vel*. gr. jfs. every three hours; and also the following bolus, once in six or eight hours:—*Mosch. Optim.* gr. xvj.—*Cinnab. fact. levigat.* ʒss.—*Pil. Sapon.* gr. viij.—*Gum. Camph.* gr. vij. *Bals. Peruv.* q. f. f. *ut bolus.*

The next morning take the following purge:—*Infus. Sennæ*, ʒij.—*Tinct. Sennæ*, ʒss.—*Sal. Cath. Glaub.* ʒij.—*Syr. Solutiv.* ʒij. mix.*

* 3 Signifies a drachm.

The same evening, or the next day, put the patient into the cold bath; rub him dry, and put him to bed; and promote a diaphoresis, by repeating the opiates and musk-bolus, and by half a pound of the infusion of Valerian and Sassafras, with as much white-wine whey as he can drink.

Let these remedies, with the bathing, be repeated for seven nights, if the dog was raving mad; and for three or four nights at the next full and change of the moon.

If the patient is seized with a *hydrophobia*, apply sponges dipped in hot vinegar, constantly to his nose and mouth; and a piece of thin flannel moistened in the following liniment, to his throat, three or four times in a day:

Linimentum Thebaicum.

R. *Tinct. Theb.* ʒij.—*Gum. Camph.* ʒj. m.

Mercurials are esteemed excellent in the bite of a mad dog, both before and after a *hydrophobia*. Some rub the *Ung. Cærul. Fort.* into the wound, and raise a salivation by mercurial unctiōn externally applied. A ptyalism should be continued three or four weeks. Calomel in small doses is beneficial; and the following emetic is called a specific, and will help in bringing forward a salivation:

R. *Merc. Emet. Flav.*—*Gum. Camph.* ʒā gr. iij. *miscæ bene*; and add *Conf. Cynosb.* q. s. ut f. bolus.

A salivation has sometimes worked a radical cure; and although the cold bath has been highly extolled, it is my opinion, that a warm one of fresh water would prove more effectual in expelling the *virus*.

Every

Every dog, on the least appearance of madness, ought to be immediately killed and buried. Is it not strange that such great numbers of those animals are suffered to live, and especially in capital towns and cities, when they so frequently run mad, and their bites are so extremely dangerous? Would it not be better for the community, if nine-tenths of them were killed?

I have lately read a melancholy account of a man who lost his life a few months ago in the State of New-York, by skinning a cow that died by the bite of a mad dog. The poison was communicated to him that way, and he died of a *hydrophobia*.

Wolves, foxes, cats, cocks, hogs, cattle, &c. &c. also run mad, and their bites are dangerous. A gentleman died not long ago by being bit by a cat, in or near London; and a young lady was in the agonies of death at Bristol, in England, when I was in that city, in Jan. 1790, who had been bit by a cat: It was supposed that the cat was bit by a mad dog before it run mad.

People that have been bit by a mad dog, will bark like a dog; and those bit by a cat, will mew like one of those animals.

Let those who may be bit by any mad animal, send immediately for a skilful physician.

Thus have I mentioned the common methods of cure, with my own opinion upon the subject. It is hoped that some better antidotes will be discovered in time, than those hitherto found out.

C H A P. XII.

*Of the Birds, Beasts, Fishes, Insects, and Amphibious
Animals in North-America.*

HAVING mentioned the names of the North-American reptiles in the preceding chapter; perhaps it may not be amiss to mention the names of the birds, beasts, fishes, insects, and amphibious animals in that part of the world.

I shall therefore proceed to mention, 1. The birds; 2. The beasts; 3. The fishes; 4. The Insects; and, 5. The amphibious animals.

I. *Of the* BIRDS.

- | | |
|-----------------------|--------------------------------------|
| 1 THE Black-bird | 15 Bald-coot bird |
| 2 Razor-bellied ditto | 16 Cut-water |
| 3 Baltimore | 17 White curlew |
| 4 Blue | 18 Cat-bird |
| 5 Buzzard | 19 Cuckow |
| 6 Blue jay | 20 Crow |
| 7 Blue grosbeak | 21 Cowpen-bird |
| 8 Brown bittern | 22 Chattering plover, or kil-
dee |
| 9 Crested bittern | 23 Crane, or blue heron |
| 10 Small bittern | 24 Yellow-breasted chat |
| 11 Booby | 25 Cormorant |
| 12 Great booby | 26 Hooping crane |
| 13 Blue peter | 27 Pine-creeper |
| 14 Bull-finch | |

28 Yellow

- | | |
|------------------------------------|--|
| 28 Yellow-throated creeper | 67 Swallow-tailed hawk |
| 29 Dove | 68 Hang-bird |
| 30 Ground dove | 69 Heron |
| 31 Duck | 70 Little white heron |
| 32 Isthra duck | 71 Heath-cock |
| 33 Round-crested duck | 72 Humming bird |
| 34 Sheldrath or canvas duck | 73 Purple jack-daw or crow
black-bird |
| 35 Buffel's-head duck | 74 King-bird |
| 36 Spoonbill duck | 75 King-fisher |
| 37 Summer duck | 76 Loon |
| 38 Black-headed duck | 77 Lark |
| 39 Blue-winged shoveller | 78 Large lark |
| 40 Little brown duck | 79 Blue linnnet |
| 41 Sprigtail | 80 Mock bird |
| 42 White-faced teal | 81 Mow bird |
| 43 Blue-winged teal | 82 Purple martin |
| 44 Pied-bill dobchick | 83 Nightingale |
| 45 Eagle | 84 Noddy |
| 46 Bald eagle | 85 The Nuthatch |
| 47 Flamingo | 86 Oyster-catcher |
| 48 Fieldfare of Carolina, or robin | 87 Owl |
| 49 Purple finch | 88 Screech-owl |
| 50 Bahama finch | 89 American partridge or quail |
| 51 American gold-finch | 90 Pheasant or mountain par-
tridge |
| 52 Crested fly-catcher | 91 Water-pheasant |
| 53 Black-cap ditto | 92 Pelican |
| 54 Little brown ditto | 93 Water ditto |
| 55 Red-eyed ditto | 94 Pigeon of passage |
| 56 Finch-creeper | 95 White-crowned pigeon |
| 57 Storm-finch | 96 Parrot of Paradise |
| 58 Goat-sucker of Carolina | 97 Paroquet of Carolina. |
| 59 Gull | 98 Raven |
| 60 Laughing gull | 99 Rice-bird |
| 61 The goose | 100 Red bird |
| 62 Canada goose | 101 Summer ditto |
| 63 Hawk | 102 Swan |
| 64 Fishing Hawk | 103 Soree |
| 65 Pigeon-hawk | 104 Snipe |
| 66 Night-hawk | |

105 Red start	124 Little thrush
106 Red-winged starling	125 Tropic bird
107 Swallow	126 Turtle of Carolina
108 Chimney-swallow	127 Water-wag-tail
109 Snow-bird	128 Water-hen
110 Little sparrow	129 Water witch
111 Bahama ditto	130 Wakon bird
112 Stork	131 Whetsaw
113 Turkey	132 Large white-bellied wood- pecker
114 Wild turkey	133 Large red-crested ditto
115 Tyrant	134 Gold-winged ditto
116 Crested titmouse	135 Red-bellied do.
117 Yellow ditto	136 Hairy do.
118 Bahama do.	137 Red-headed do.
119 Hooded do.	138 Yellow-bellied do.
120 Yellow rump	139 Smallest spotted do.
121 Towhe bird	140 Wren
122 Red thrush	
123 Fox-coloured thrush	

Unto this catalogue should be added the winter phebe, and the summer phebe; also the red mavis, whip-poor-will, and robin-red-breast.

The Americans raise great numbers of geese, turkeys, peacocks, doves, ducks, dunghill fowls, Guinea hens, &c. so that poultry is very plenty and cheap. In some places, numerous flocks of pigeons come from distant countries, and are caught by the people in nets.

The swan is the biggest of all web-footed water-fowls.

The pelican is also a water-fowl. It lives at the River Mississippi. Its pouch, or crop, will hold eight quarts. They are about five feet from the end of their bills to that of their tails.

The humming bird is the smallest, and the lark ascends the highest of all the winged tribe.

II. *Of the* BEASTS.

- | | |
|----------------------|----------------|
| 1 Mammoth | 25 Black fox |
| 2 Buffalo | 26 Red do. |
| 3 Panther | 27 Grey do. |
| 4 Carcajou | 28 Raccoon |
| 5 Wild cat | 29 Wood-chuck |
| 6 Bear | 30 Skunk |
| 7 Elk | 31 Opossum |
| 8 White bear | 32 Polecat |
| 9 Wolf | 33 Weasel |
| 10 Moose deer | 34 Martin |
| 11 Stag | 35 Minx |
| 12 Carrabou | 36 Beaver |
| 13 Fallow deer | 37 Musquash |
| 14 Greenland deer | 38 Otter |
| 15 Rabbit | 39 Fisher |
| 16 Bahama coney | 40 Water-rat |
| 17 Monax | 41 Musk-rat |
| 18 Grey squirrel | 42 House-mouse |
| 19 Grey fox squirrel | 43 Field-mouse |
| 20 Black squirrel | 44 Moles |
| 21 Red ditto | 45 Quick-hatch |
| 22 Ground ditto | 46 Morsé |
| 23 Flying do. | 47 Porcupine |
| 24 Striped do. | 48 Seal. |

The mammoth is not to be found in the civilized parts of America. It is supposed he lives North of the Great Lakes. They are very large according to their skeletons, which have been found on the Ohio, and in New Jersey.

The opossum is about the bigness of a common cat.

The buffalo is larger than an ox.

The tyger is a very fierce ravenous animal, and will spare neither man nor beast; but it is not apt

to fly at mankind if it can get the flesh of other animals to live upon: its shape is something like that of a lioness.

The wild cat is much like a common cat, but a great deal larger: they are very fierce, but seldom attack people.

The elk resembles a deer, but is much larger than a horse: they have very large horns, which they shed every year, in February; and by August, their horns almost come to their full growth.

The moose is about the bigness of a deer: they have large horns, which they shed annually.

The carrahou resembles a moose, but is not so large.

The carcajou is of a cat kind: I suppose they are what we call catamounts in New-England. They kill elks, carrahou, and other deer, by lying in ambush on the limbs of trees, or in some other place; and when an elk or deer draws near, he jumps upon its neck, seizes the jugular vein, and soon kills his prey; but if the elk can jump immediately into the water, he may save his life, for the carcajou will lose his prey rather than venture into that element.

The skunk, called by the French, *Enfant du Diable*, the child of the devil, is something less than a polecat. When this animal is pursued, it sends forth, in its defence, a small stream of water from a receptacle near its bladder, which has such a subtle, powerful and penetrating smell, that it will taint the air with a horrible stench, to a surprizing distance. Their fat is an emollient,
and

and very beneficial for stiff joints, and for gouty and rheumatic complaints.

The porcupine, or hedge-hog, is about the bigness of a middling dog. It is covered with quills near four inches long. They shoot their quills at their enemy; and if they enter the flesh at all, they will work through, unless extracted by incision; for they cannot be extracted without, any more than a fish-hook.

The wood-chuck is about fifteen inches in length; it digs holes several feet into the ground, in which it burrows.

The racoon is about the bigness of a fox, only it is not so thick; they climb trees. The first I ever saw, I shot from the top of a high tree, when I was young; and could not tell what it was, till an old hunter came along, and told me what I had killed.

The bears sometimes do much damage, by killing sheep, destroying Indian corn, &c. And the wolves are great sheep-killers; and sometimes when they have been very hungry, they have killed people, and eat their flesh: And the bears have also killed people, when they have come near their young cubs; but they do not often meddle with the human race, unless they have been wounded, or are afraid of losing their young.— But the catamounts are the most to be dreaded of all the wild beasts in America; for they are so very fierce, that it is dangerous coming near them.

The Americans raise great numbers of neat cattle, horses, sheep, swine, dogs and cats.

III. Of

III. *Of the* FISHES.

IN the rivers, brooks, ponds, and lakes, we have divers kinds of Fishes, as well as in the salt-waters adjoining the American Continent.

The American Fishes are,

1 The whale	18 Chivens
2 Shark	19 Frost fish
3 Dolphin	20 Eels
4 Flying fish	21 Pouts
5 Sword fish	22 Breams
6 Sturgeon	23 Shiners
7 Haddock	24 Shad
8 Salmon	25 Sheep's-head
9 Salmon-trout	26 Lobsters
10 Common trout	27 Clams
11 Flounders	28 Oysters
12 Cod-fish	29 Succers
13 Pike	30 Black fish
14 Mackarel	31 Porpoise
15 Herring	32 Sea-tortoise
16 Sprats	33 River ditto.
17 Smelts	

The Sharks are very large, and so very greedy that they will kill and swallow a man instantaneously.

IV. *Of* INSECTS.

1 The glow-worm	9 Wall-loufe or bug
2 Earth-worm	10 Sow-bug
3 Leg or Guinea worm	11 Horn-bug
4 Naked snail	12 Bed-bug
5 Shell-snail	13 Flea
6 Tobacco-worm	14 Gnat
7 Wood ditto	15 Sheep-tick
8 Silk do.	16 Wood-loufe

Z

17 Forty

17 Forty legs, or centipes	34 Fly
18 Caterpillar	35 Sand-fly
19 Adder bolt	36 Black fly
20 Cicadia, or locust	37 Horse-fly
21 Man-gazer	38 Musketo
22 Cock-roche	39 Spider
23 Cricket	40 Millar
24 Beetle	41 Head-lice
25 Fire-flying bug	42 Body-lice
26 Butterfly	43 Cattles lice
27 Moth	44 Hogs lice
28 Ant	45 Hessian fly
29 Bee	46 Dore
30 Humble-bee	47 Maggots
31 Black wasp	48 Crabs
32 Yellow wasp	49 Ear-wigs.
33 Hornet	

V. *Of AMPHIBIOUS ANIMALS.*

THESE go sometimes on the land, and sometimes in the water.—The Alligators are often five yards long; they kill hogs, dogs, fish, &c. and live in South-Carolina. When winter draws near, they fill their bellies with pine-wood, and crawl into their dens in the bank of some creek or pond, and lie all winter without any other sustenance.

The guana, green lizard, blue-tailed lizard, and lion lizard, are found in the Southern States.

The beaver is an amphibious animal, about four or five feet in length, and fifteen inches in breadth. They cut down trees, make dams across small rivers and large brooks, and build cabins to live in.

The musquash is also amphibious, and so are frogs, otters, and minxes.

C H A P. XLII.

*Of Burns, Scalds, and Freezes—Of the Growth of Hair, Baldness, &c.*I. *Of Burns and Scalds.*

DRAW the fire out immediately by the application of a poultice of raw onions beat fine in a mortar. Boiled or roasted onions may answer; but they are not so drawing as when raw. Renew the cataplasm twice or thrice in a day; bleed the patient, if he is plethoric; and keep the body open with gentle cathartics:—this will prevent an inflammation.

When the fire is extracted, go to the apothecary, and buy *Ol. Lini.* 6oz. *Spir. Vin. Campb.* 2oz. *mix.* and apply it as occasion requires.—This is said to prevent the rising of blisters.

If blisters have risen, open them, and dress the parts with *ceratum album*, or *ceratum epuloticum*, or *ceratum saturninum*.

If there are signs of a mortification, apply antiseptics, both internally and externally.

Persons burnt with lightning, should take cordials; and if the pain is great, anodynes are necessary.

The oil of olives, and emollient fomentations and cataplasms, are good in burns and scalds.

II. *Of Freezes.*

KEEP the parts in cold water 'till the frost is out. Then use emollient fomentations and cataplasms, with the other remedies used in burns.

When people are exposed to the frost, they ought to drink cold water, instead of spiritous liquors, as it will prevent freezing much longer than inflammable spirits.

Copperas dissolved in warm water, and linen-rags dipped therein, and applied often to a freeze, is said to be excellent.

III. *Of the Growth of Hair, the Cause of Baldness, and how to prevent it.*

A HAIR hath a bulbous root, of an oval shape, which is lodged in the skin. The hair itself is hollow, and is furnished with vessels something like the quills of geese, or feathers of birds. Hairs have joints and branches, like some sorts of grass, and are apt to split at the ends, if worn long without moisture. They will grow as long as any moisture remains at their roots, in a body, even if it is dead and mouldered into dust.

Robust persons have generally strong hair; and those that are feeble, that which is weak.

Malignant and contagious diseases, and the eating of mushrooms, will sometimes destroy the roots of hairs, and occasion baldness. Violent fevers, that dry up the moisture that nourishes the hair, may also cause it to fall off. The meeting
with

with trouble, great surprize, and bad humours, often makes the hair turn white or yellow, or causes baldness, by destroying the nutritious juices.

Hair-dressers ought to be very gentle in the dressing of hair, for pulling of it may weaken the roots, and make it fall off.

I have known baldness prevented by a frequent bathing in salt-water when the hair began to fall off. The salineous particles, and the coldness of the water, contracts, braces up, and strengthens the parts relaxed by some disorder.

The following is esteemed beneficial in baldness :

1. Rub the parts with a fresh-cut onion, till they turn red ; but if no redness appears, it is a bad sign.

2. Wash the head every night, with a warm and very strong fomentation, made by boiling bruised burdock-roots in white-wine.

3. Or, bruise the small spiral branches of grape-vines, and mix them with honey, and apply the mixture twice in a day.

4. Or, *R. Ung. Simpl.* ʒiv.—*Bals. Peru.* ʒj—*Ol. Nuc. Mosch. Gutt.* x. *mix.* and apply it twice in a day.

Hair-powder and pomatums are nourishing to the hair ; but if they are too highly scented with chymical oils, which are of a burning nature, they may prove injurious.

Some are so superstitious, that they suppose it is unlawful to nourish their hair by powder. I

knew a clergyman that preached upon probation, and the people thought he was unfit for a Minister of the Gospel, because he wore powder on his hair ; however, they supposed it was legal for other clergymen to wear powdered wigs. But we may judge it is lawful to powder our hair, in as much as we have had no command from Heaven that forbids that practice.

C H A P.

C H A P. XLIII.

Account of Prescriptions—How regular-bred Physicians are often treated—Physical Receipts for the Cure of Agues, Asthmas, Bruises, Cancers, Coughs, Cholics, Colds, Consumptions, Cramps, Convulsions, Deafness, Diabetes, Diarrhœa, Dropsy, Dysentery, Epilepsy, Fainting, Fevers, Gout, Gravel, Gripes, Head-ach, Heart-burn, Hypochondriac Distempers, Hysteric Complaints, Hoarseness, Hæmorrhoids, Jaundice, Inflammations, Indigestion, Itch, King's Evil, Lethargy, Lowness of Spirits, Madness, Measles, Mortification, Pains, Palsy; Perspiration to check, or to promote; Phlegm, Pleurisy, Quinsy, Rheumatism, Rickets, Rupture, Scurvy, Shingles, Small-pox, Stitches in the Side, Sprains, Sore Throat, Tetters, Thrush, Tumours, Vertigo, Vomiting, Ulcers; Urine suppressed—Heat of—Involuntary—Bloody; Worms, and Wounds; with Directions for Nursing Children.

THE remedies mentioned in the subsequent pages, if properly exhibited, are very efficacious in the cure of distempers; and I hope the prescriptions will be of great utility to people in general, and to those in particular who may be settled in places where physicians cannot be had, which is often the case in many parts of America.

I have mentioned the doses, and given directions concerning the use of the compositions, in order to prevent injury to those who may be under the necessity of taking medicine without the advice of a physician: but all the doses, excepting those prescribed for children, are for persons of an adult age, and must be enlarged, or diminished, according to the age and constitution of the patient.

As the symptoms of diseases are sometimes very subject to mutation, they require different modes of treatment: Hence, the medicines should be changed, or altered, according to the circumstances of those afflicted with bodily weakness and indisposition.

I have often observed, that a medicine that will cure a disease at one time, will not cure it at another. Hence also appears the necessity of altering our practice, by exhibiting some other remedies that will work a radical cure.

Those who attempt to practise physic, ought to know,

1. What disease a patient is seized with;
2. What his constitution is, that is, whether it is strong or weak;
3. What remedies ought to be applied; and,
4. What their strength is, and how they will operate.

But it cannot be expected that those unacquainted with the noble art of physic can know all these things; and therefore, it will be most prudent to send for a skilful Physician where one can be had, and to be guided by his directions. The
sooner

sooner he is called, the better; because a disease is much easier cured when it first begins, than after it is seated.

Some who have called themselves Physicians, have suffered diseases to gain ground, by neglecting to make proper evacuations. A patient who appeared to be almost gone in a consumption, and had been given over by his physicians as incurable, applied to me for advice.—Said I, what have your physicians done for you?—Have they bled you? He answered, No.—Have they given you an emetic? No.—Have they given you a cathartic? No.—Have they given you any medicine? Yes: they have given me simple syrups and decoctions for more than six months past; but they would not bleed me, nor give me an emetic, because they supposed I was so weak that I could not bear either.—I bled him immediately, gave an emetic, ordered the bark, and some other remedies. His cough, night-sweats, and other terrible symptoms, left him, and he soon recovered his former health and strength. It is my opinion, that it is almost as proper to throw medicines into the fire, as it is to give them to patients, without making those evacuations which are necessary to expel the morbid matter.

Much damage has been done by ignorant women, who have rushed into the practice of midwifery, without those qualifications which are requisite for this important business. I have frequently been called to assist them when there has not been the least difficulty, except that which
arose

arose from their ignorance and misconduct. Sometimes I found they had poured down the decoctions of hot herbs, and had raised fevers, &c. Sometimes they had almost affrightened the women into convulsions, by telling frightful stories, and by talking about the doctrine of original sin, election, reprobation, the unpardonable sin, and the torments of hell.—But after I had administered proper remedies, and had, by encouraging them, brought them out of their despair, they have been safely carried through their perils and dangers without any uncommon difficulty. It is dangerous for women to venture their lives in the hands of those who know not the construction of the human frame, nor the nature and operations of medicines, and who, by scare-crows and bug-bears, bring them into a state of discouragement, to the great injury of the child and the mother.

It is thought, that no men are treated much worse than the Physicians have been in some parts of the world; for, let their skill be ever so great, they have frequently been interrupted in their practice, to the great injury of their patients: for, when they have laid a foundation for a cure, other medicators have taken the work out of their hands, and hindered a regular course of physical operations; just as a Divine might be hindered from preaching a sermon, by being turned out of his pulpit, after he had named his text and the heads of his discourse, by some up-start not skilled in divinity.

I have often thought that this illegal practice has been the cause of the death of thousands; for

whilst the quack is administering his *nostrums*, the disease gains ground, and an end is put to the life of the patient.

Regular-bred Physicians are frequently imposed upon in this way, for many people are very fond of those who have raised their fame by quackery: Hence they leave the man of skill, and run after impostors.

Sometimes when a skilful Physician has prescribed proper remedies for a patient, his orders are disobeyed by the nurses; and whilst he is absent, in comes Mother Midnight with her budget of herbs, and makes and administers decoctions destructive to the relief of the distressed, 'till at length death closes the scene.

I have often wondered at the madness and folly of some people, who will venture their lives in the hands of quacks, sooner than they will venture their estates. When they go to law, they will be sure to employ a good lawyer, for fear of losing their money; but when they are taken ill, and their lives are in imminent danger, they will pass by a skilful Physician, and employ an impostor, and thus perhaps lose their lives by their folly.

A Physician must turn out at all times in the night, even in the most violent storms, and take care of both the rich and the poor; and he must wait a long time for his money, as the merchant, baker, butcher, brewer, &c. must have their payment first; and then, if he charges but a very moderate price for his services, he will be cursed, railed at, defamed, and at last censured to the infernal regions, as an extortioner. I do not say that

that this is the practice in every place within the circle of my acquaintance; but it has been too much the practice in some places, and it is now high time there was a reformation.

I own that people have a right to employ what physicians they please, providing they are men of skill; but they have no right to commit self-murder, by employing quacks.—Let all, therefore, who may have any regard for their own lives, and the lives of those under their care,

1. Send for a man of skill—who is very temperate, humane and just; because a drunkard, unmerciful, or inhumane person, is by no means fit for the important work.
2. Be very strict in observing his directions.
3. Let him not be interrupted by impostors.
4. Let him visit the patient as often as may be necessary.
5. If other advice shall be thought needful, give him notice.
6. If another physician is called in, let him that has had the care of the patient first, tell the symptoms of the disease, what remedies have been applied, and how they have operated.
7. After they have prescribed remedies, still employ the first physician. Let the same directions be observed in regard to surgeons and midwives.

This is much safer than to change physicians, or employ quacks, and female impostors, who frequently impede the regular practice of well-bred physicians, and bring destruction on their patients.

Physicians

Physicians ought to visit their patients often when they are smitten with dangerous disorders, and especially if the symptoms vary, because new remedies may be needful.

A constant fire ought to be kept in a room where a patient is ill; and if the disease is of a putrid kind, the fumes of cyder-vinegar, burnt in a hot crucible, is an excellent antiseptic; it is not only good for the patient, but prevents the bystanders from taking the distemper.

These things being premised, I proceed to the Physical Recipes, and shall write in English, for the benefit of those unacquainted with Latin.

Ague.—Boil four ounces of the best Peruvian bark in a gallon of water, till half is consumed; and take two ounces of the decoction thrice in a day, after proper evacuations have been made.

Asthma.—Take twelve ounces of the milk of ammoniacum; of the syrup of squills, four ounces: mix, and take a spoonful when the shortness of breath is troublesome.

Bruises internal.—Take of Lucatellus's balsam, one ounce; conserve of roses, two ounces; syrup of red poppies, a sufficient quantity: mix, and take a drachm three times in a day.

Bruises external.—Take of the spirits of rosemary, one pint; of hard Spanish soap, three ounces; camphor, one ounce: digest the soap in
the

the spirit till it is dissolved, then add the camphor. Rub some of the composition into the parts affected, and repeat it as occasion may require. It may also be taken inwardly, from 30 to 50 drops in a glass of water.

Cancers.—Apply the extract of hemlock as a plaister, for a long time. Some have taken it inwardly, by beginning with two grains in the morning, and as many in the evening; increasing the dose gradually to fifteen grains. But sometimes it will make the patient giddy-headed.

Cough.—Take of spermaceti in powder, three drachms; oil of olive, half an ounce; yolk of egg, a sufficient quantity; of spring-water, six ounces; of strong cinnamon-water, two ounces: mix. The dose is two spoonfuls, to be taken when the cough is troublesome.

Cholic.—Bleed; give an infusion of camomile-flowers; inject anodyne clysters; exhibit gentle cathartics, &c. But send for a Physician.

Colds.—Take of distilled vinegar, two ounces; drop into it, by degrees, the spirits of sal-ammoniac, till the effervescence entirely ceases. The dose is half an ounce twice in a day, in an equal quantity of the syrup of marsh-mallows. It will promote sweat.

Consumptions.—Take ground-ivy, colts-foot, and liquorice-root, of each two ounces; elecampane,
one

one ounce: boil them in nine quarts of water to a gallon. A quarter of a pint may be drank at once, and taken as common drink, or three or four times in a day. It is good for spitting of blood, and inward bruises, as well as the consumption.

Cramp.—Drink a glass of tar-water night and morning. The taking hold of a roll of brimstone, which will soon break, gives relief. The same remedies that are prescribed for bruises, are also excellent.

Convulsions.—Take of native cinnabar, one scruple; of the conserve of red roses, four grains: mix, and form it into a pill. This quantity is to be taken every night and morning. A decoction of the powder of Valerian root may also be taken.

Deafness.—Take of the oil of bitter almonds, three drachms; spirit of sal-ammoniac, one drachm. Drop a few drops into the ear at bedtime, and stop it with black wool.

Diabetes.—Take of the powder of Peruvian bark, one ounce; mix it into an electuary, with simple syrup. Take the quantity of a nutmeg three or four times in a day. Simple syrup is made by dissolving in water, so much of double-refined sugar as will make a syrup.

Diarrhœa.—Take of rhubarb in powder, fifteen grains; scordium electuary, half a drachm; mix.
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This is for one dose, and must be repeated as occasion shall require.

The patient must abstain from malt-liquors, and may take the following, *viz.* Take of burnt hartshorn, two ounces; gum-arabic, two drachms; of water, three pints: boil till one-third is consumed. This is prescribed for common drink.

Dropsy.—Take of the powder of jalap, half a drachm; powder of ginger, six grains; syrup of buckthorn, a sufficient quantity; mix. This may be taken twice a week. Also,

Infuse a handful of camomile-flowers in a quart of boiling water, and add a gill of melasses spirits. Take a quarter of a pint twice in a day. Or,

Take of the roots of zedoary, two drachms; dried squills, rhubarb, and juniper-berries bruised, of each one drachm; the powder of cinnamon, three drachms; salt of wormwood, one drachm and an half: infuse in a pint and an half of old-hock wine. Strain, and take a gill twice or thrice in a day: It is a powerful diuretic.

Dysentery.—Take of the jelly of starch, two ounces; of styptic tincture, one ounce; extract of opium, two grains: mix. For an enema.

Purges of rhubarb are excellent, also the common drink directed in the diarrhœa.

If the patient has a fever, let a drachm of nitre be dissolved in the common drink: a quarter of a pint may be drank four or five times in a day.

Epilepsy.

Epilepsy.—Take two ounces of the powder of Valerian root; of simple syrup, six ounces: mix; and take a quarter of an ounce twice in a day.

Fainting.—Take of simple alexiterial water, half a pint; of treacle water, two ounces; syrup of red poppies, half an ounce; mix. Two or three spoonfuls may be taken at a time.—Or,

Take of wood-foot, two ounces; of asafœtida, one ounce; of proof spirit, a quart: digest and strain. Take two drachms twice in a day. All volatiles are good for fainting.

Fevers, inflammatory.—Take of the salt of tartar, one ounce and an half; of the juice of lemons, eighteen ounces; of spiritous alexiterial water, half a pint; of spring water, a quart; of loaf sugar, three ounces: mix. Take three large spoonfuls thrice in a day.—Or,

Take of sal-nitre, half an ounce; of white sugar, two ounces; cochineal, one scruple; of spring water, two pounds and an half: boil to a quart, and pour off the decoction when it is settled. The dose is four ounces three times in a day.

Vomits and purges may also be needful.

When a fever is too high; it ought to be lowered by evacuations, coolers, &c.: and if it is too low, it ought to be raised by cordials, blisters, &c. I have made a practice of bleeding patients in inflammatory fevers in America, and never perceived that it hurt any person. Nay, I have had 185 patients under my care at one time, that were

ill with fevers, the greatest part of whom I bled; and they all recovered excepting a woman, who was so far gone when I was called to her, that she could not take any medicine.—My practice was,

1. To bleed, if the patient was plethoric, and the fever inflammatory.

2. To exhibit an emetic, when there was too great a quantity of bile.

3. To keep the body open with laxatives and gentle purges.

4. To lower the fever, if it was too high, by nitrous preparations, and an antiphlogistic regimen.

5. To raise it, if it was too low. ¹ / blisters, cordials, &c.

6. To exhibit antiseptics freely, when the patient could bear them.

I have found preparations of the gum myrrh very beneficial, when the bark could not be taken.

I frequently observed, that where physicians had neglected to bleed their patients, and to make other evacuations, that death commonly closed the scene.

I find that bleeding is very much exploded in London, although its effects have been so beneficial in America. But it appears to me, that there is a difference in the climates, which makes bleeding not so requisite here, as it is in the western parts of the world.

Bleeding in general has been neglected in America, in the putrid fore throat; but I have often thought,

thought, that in some cases it may be of great service, and especially when the patient is first taken ill, and the symptoms are inflammatory.

In the year 1783, I visited a patient who had been ill with this disorder about seven days, and could neither speak nor swallow any thing. I at a venture opened a vein, and it gave immediate relief. In less than an hour he could speak very well, and take medicine. He recovered in a few days.

Bleeding, in my opinion, is proper when there is too much *crassamentum* in the vessels, or when the veins and arteries are too much crouded. But the pulse are the best guide; for when they are full, strong, and tense, they indicate that phlebotomy is needful; and if it is neglected, the fluids may stagnate, and bring on putrid disorders. Bleeding when a patient is plethoric, makes way for a free circulation; and those whose blood circulates freely, can endure the cold much better than those whose sanguinary vessels are crouded. But the pulse may be raised by rarefaction; and when that is the case, bleeding may be improper. It ought to be known, before an attempt is made to bleed a patient, whether it is a plethora, or a rarefaction, that raises the pulse.

The fevers are so numerous, that I shall not mention the whole of them in this Oracle; and therefore will conclude by observing, that if they are intermitting, the bark is a sovereign remedy; if nervous, nervines, &c.

Gout.—Take half a dram of gum-guaicum in powder; of conserve of roses, one scruple; of

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simple

simple syrup, a sufficient quantity for a mixture. This is for one dose, to be taken every morning.

—Or,

Take of the spirits of sal-ammoniac, and liquid laudanum, of each half an ounce; of the spirits of wine camphorated, three ounces: mix. This is excellent for external use.

But about 12 drops of camphorated spirits ought to be taken in a little water, to defend the stomach when the external remedy is applied.

Gravel.—Take of the best white soap, half a drachm; of the oil of juniper, five drops; of simple syrup, enough for a bolus. This quantity is to be taken twice in a day.—Or,

Take of hard soap, one ounce; oil of anise-seeds and carraway-seeds, of each half a drachm; of simple syrup, a sufficient quantity: mix. The dose is a drachm thrice in a day.—Gentle purges and anodynes are sometimes needful.

Gripes.—See *Cholic*.

Head-ach.—Bleeding, emetics, cathartics, cephalics, &c. as *Rad. Valerian*. Let the cause of the pain be enquired into before remedies are exhibited.

Heart-burn.—Take two or three drachms of *magnesia alba* every day.

Hypochondria—Take of Virginia snake-root, and *hiera picra*, of each two drachms; extract of gentian,

tian, half an ounce : make them into pills with white syrup. Take half a drachm night and morning.

Hysterica.—Take of the milk of ammoniacum, one pint ; of the tincture of asafœtida, half an ounce ; mix.—The dose is two spoonfuls, as occasion may require.

Hoarseness.—Take of spermaceti, two drachms ; dissolve it in the yolk of an egg : add of alexiterial water, six ounces ; of nutmeg water, one ounce ; of white sugar, a drachm and an half ; mix.—This quantity may be drank, or taken at two or three times.

Hæmorrhoids.—Take of lenitive electuary, and the flour of sulphur, of each equal parts ; of simple syrup, enough for an electuary. A drachm may be taken night and morning.

Jaundice.—Take of white soap, half a drachm ; oil of juniper, five drops ; of simple syrup, enough for a mixture. This quantity may be taken twice in a day.—Sometimes emetics and gentle purges are very beneficial.

Inflammations.—Bleeding, emetics, cathartics, nitrous preparation ointment of marsh-mallows, anodynes, &c.

Indigestion.—After the operation of an emetic, take of the powder of ginger, and long pepper, of each fifteen grains ; conserve of orange peel, ℞ ʒ 3 a scruple ;

a scruple; simple fyrup, enough for a bolus: mix.
A bolus is only one dose.

Itch.—Take of corrosive sublimate, half a drachm; dissolve it in a pint of boiling water; and at bed-time, wash the parts affected. Be very careful of the sublimate, for a few grains taken inwardly before it is dissolved, will soon kill a patient. But the solution applied outwardly, with prudence, will do no harm, and wholly cure the itch. It may be proper to take the bolus prescribed for the hæmorrhoids, several times, whilst the solution is externally applied.

King's Evil.—Take one pound twice in a day of sea-oak calcined. This plant is also called sea-wrack, and is common on rocks that are left dry at ebb-tide. The leaves gathered in July, beat in a mortar, and put into a glass, with the same quantity of sea-water, will, after standing ten or fifteen days, make an excellent liquor for discussing of glandular swellings: it penetrates through the skin, exciting a slight sense of pungency. The parts should be rubbed two or three times in a day with the strained liquor, and be afterwards washed with clean water. Let the calcined powder be taken in the mean time.

Lethargy.—Take of the salt of hartshorn, two drachms; of spring water, a pint; of spiritous alexiterial water, one ounce; of loaf sugar, half an ounce: mix. Take four large spoonfuls thrice in a day.—Bleeding, emetics, blisters, stimulating enemas, volatiles, &c. are often beneficial.

Lowness

Lowness of Spirits.---Take simple alexiterial water, half a pint; of spiritous alexiterial water, two ounces; of cordial confection, two drachms; mix, and take three or four large spoonfuls every six hours.

Madness.---Bleed, vomit, purge, blister, bathe in warm water; use gentle exercise, a slender diet, travelling, &c.; or use those remedies that your Physicians shall think may be best.

Measles.---Bleed, if the patient is phlethoric; vomit, if there is too much bile; and purge, as occasion may require. Let not the patient be kept too warm; and let him have a plenty of boiled water, with a little nitre, if he is feverish.

I had the measles when I was young, and was almost murdered by being kept in a hot bed for five days, without being suffered to get up; by having inflammatory decoctions poured down, and by being kept from drinking water. This raised a high fever, and brought on a delirium; but an hemorrhage at my nose supervened, which gave some relief. The nurses informed me that I fainted away when I was permitted to sit up; but I was not sensible of it. This evil practice of keeping patients too hot, of not letting them have water, a proper air, &c. has been the death of thousands who have had the small-pox and measles; but modern practice teaches better things.

Mortification.---Bleed, if it is needful, and exhibit antiseptics plentifully.

Pain.---The brain is said to be the seat of pain, because it is the seat of sensation ; but most authors have imputed the cause of pains to the stretching of the nerves.

Pain may be caused by a variety of diseases, and by bruises, wounds, dislocated joints, broken bones, &c.

Anodynes, gentle opiates, an infusion of camomile, &c. are proper remedies for patients afflicted with pain.

Palsy.---Take two ounces of the powder of Valerian root, and of simple syrup six ounces; mix, and take two drachms twice in a day.

Perspiration to check.---Elixir vitriol, Peruvian bark, &c.

Perspiration to promote.---Take of alexiterial powder, twenty-four grains; of simple syrup, enough for a mixture. This quantity may be taken once every six hours, and the patient may drink an infusion of camomile.

Phlegm.---Take of the milk of ammoniacum, twelve ounces; of the syrup of squills, four ounces; mix. A large spoonful is a dose.

Pleurisy.---Bleed, and make other evacuations; take of barley, raisins stoned, and figs, of each two ounces; of liquorice root, half an ounce; of water, two quarts. Boil the barley first, then add the raisins, and afterwards the figs and liquorice :
half

half of the water must be boiled away. This may be drank freely.

Quinsey.—Bleed, give warm water-gruel, barley-water, and chicken-broth, as occasion may require.

Take of fenna, one ounce and a half; crystals of tartar, three drachms; of carraway-seeds, two drachms; of water, one pint. Boil the tartar till it is dissolved, and whilst it is boiling, pour it on the other ingredients, and strain when it is cold.

To three ounces of this infusion, add one ounce of the syrup of buckthorn, and half an ounce of carraway water. This may be taken two or three times in a week for a purge.

For a Gargle.—Take of the tincture of roses, one pint; of the honey of roses, two ounces. Mix.

Rheumatism.—There are different kinds of rheumatisms, and hence there must be different modes of treatment.

When there is an inflammation, bleeding is proper, and also nitrous preparations.

Emetics, cathartics, anodynes, diaphoretics, &c. may all be requisite in some cases.

Sometimes, after evacuations, the cold bath has done great service,

Rickets.—Magnesia alba may be taken, and a strengthening plaister applied to the back. Some plunge their children into cold water, rub them with

with a cloth, and afterwards make them sweat between two blankets. The water ought not to be too cold, and the child should be dipped with its face downward, to prevent its being strangled.

Rupture.—The parts should be gently reduced to their former position, and then fomented with the following, *viz.* Take of oak-bark, an ounce and an half; of smiths forge-water, three pints; boil to one quart, then add two drams of roche allum. A strengthening plaister is also good, and corroborants taken inwardly.

Scurvy.—Abstain from liquors boiled in copper vessels; and take freely of the juice of lemons, and other acid vegetables.

Shingles.—Abstain from pork, malt liquors, and cheefe; gentle purges should be exhibited.

Take of gum guaicum, half a scruple; Æthiop's mineral, half a drachm; simple syrup, enough for a bolus; mix, and take this quantity twice in a day.

Small-pox.—If the inflammation and pain is great, bleed; keep the patient cool, and let him exercise as much as his strength will admit. Nitrous decoctions, and a plenty of diluting liquors may be drank cold: nothing ought to be taken that will inflame the blood. Sometimes emetics and cathartics are of service; and calomel is excellent in many cases, and likewise the bark. I observed when I practised inoculation, that when proper

evacuations

evacuations were made in the beginning of the distemper, the patients had it very light.

Stitches in the Side.—Take half a pint of neats-foot oil; of the spirits of wine camphorated, and the spirits of sal-ammoniac, of each two ounces; mix, and rub into the parts affected:—taking in the mean time, about twelve drops of camphorated spirits, to defend the stomach.

Sprains.—Apply opodeldock to the parts injured, and take in the mean time from thirty to sixty drops of the *balsamum traumaticum*.

Sore throat.—Take of Mindererus's spirit, and the syrup of marsh-mallows, of each an ounce; mix, and sweeten with honey. This quantity may be taken at bed-time, or as occasion may require.

Tetters.—Take of quick-silver, one ounce; of strong spirits of nitre, two ounces; digest in a sand-heat till the mercury is dissolved, and add, whilst it is hot, one pound of sweet oil: stir the composition till it is cold, then rub some of it into the parts affected, and repeat it till a cure is completed.

Thrush.—Take of the fresh inner bark of elm, four ounces; of water, three pints; boil till one-third is consumed; strain, and sweeten with honey. A gill or more may be taken at once; it may also be used warm as a gargle.

Tumours.

Tumours.—If they must be brought to a suppuration, take of white-lily roots, onions, and lint-feed flour, of each one ounce: boil in a sufficient quantity of water, till they are soft, and add one ounce of Burgundy pitch. Apply this as a poultice.

If they must be discussed, take of the grounds of stale beer, a pint; of oat-meal, a sufficient quantity: boil to the consistence of a poultice; and add, of the oil of olives, six ounces: then apply it to the parts affected.

Vertigo.—Bleed and purge, with the following, *viz.* Take of the sacred tincture, one ounce; of the compound spirits of lavender, one drachm; mix. The whole may be taken at once, and repeated as occasion may require.

Vomiting.—Take of the dried leaves of spearmint, one ounce; then pour on a pint of boiling simple mint water. Strain, when cold, and take a large spoonful every hour.

Ulcers.—Take half a pound of yellow basilicon; of verdigrease prepared, one drachm; mix: and apply some of it as a plaister.---It deterges, cleanses, and wears away fungous flesh.

Urine suppressed, and heat of.—Take of nitre, half an ounce; white sugar, two ounces; of cochineal, one scruple; of spring water, a quart and half a pint; boil to a quart, and pour off the decoction after it is settled. The dose is two or three ounces, three or four times in a day.

Urine,

Urine, involuntary.—See *Diabetes*.

Urine, bloody.—Take of red rose-buds, half an ounce; oil of vitriol, twenty drops; boiling water, two pints and an half; of loaf sugar, an ounce and an half; when it is cold, strain off the liquor. The dose is three ounces thrice in a day.

Worms.—Take of prepared tin, one pound; conserve of wormwood, two ounces; of simple syrup, enough for an electuary; mix. Half an ounce is a dose, to be taken every morning.

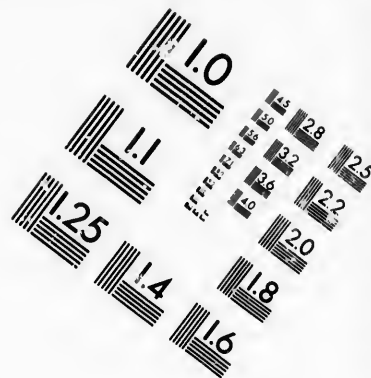
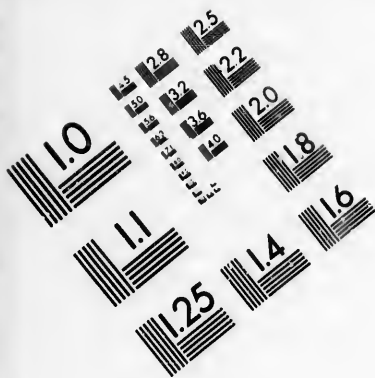
Wounds.—Dress them with dry lint, general balsam, ointment of gum elemi, yellow basilicum, &c.

If the wounds are internal, see *Bruises*.

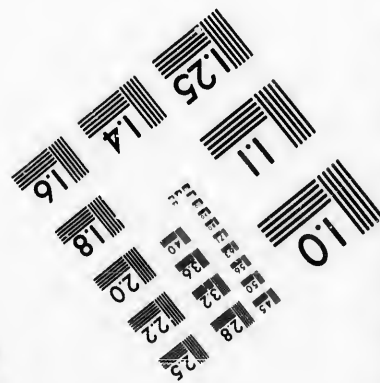
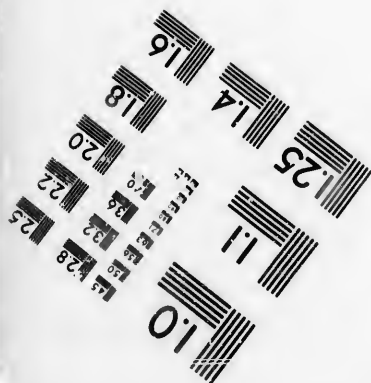
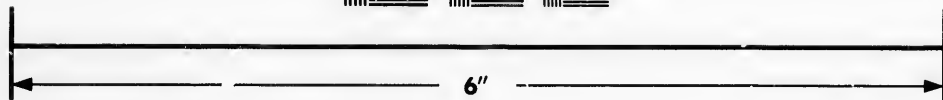
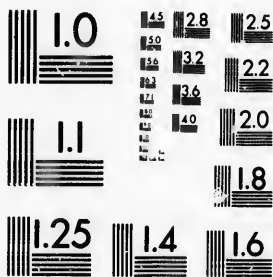
Directions for Nursing Children.

Infants should be kept clean, and their clothing ought to be loose and cool; but not so cool as to make them take cold. It was formerly the practice in America, to wrap a flannel swathe, that was near two yards in length, tight round the waist of every new-born infant, to make it grow straight. This pernicious practice has undoubtedly been the cause of the death of thousands; for it obstructed the circulation of the fluids, hindered digestion, generated crudities, and produced convulsions.—It was also the practice to keep three or four caps on their heads, and to squeeze their heads together, when, according to the vulgar expression, they
appeared





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appeared to be open. But this practice was also very hurtful; for it often injured the brain, and impaired the senses.—The head of the child, as well as the body, ought to be loosely clothed, and its formation left to the action of the *dura mater*; for the open or soft parts will naturally grow hard, without any manual operations.

From an infant's birth, till its mother's milk can be obtained, no other diet will be requisite but milk and water, which may be given luke-warm; some add a little sugar to the composition. Warm milk, however, just taken from an animal, is the best.

If the child is to be nursed without the breast, equal parts of milk and water will be sufficient at first; and as strength increases, a more solid diet will be required.

The milk of the mother may be injured by diseases, frights, weak nerves, anxiety of the mind, &c. any of which may injure its quality, diminish its quantity, or cause it to be wholly dried up. In such cases it is proper to wean the child; but if it will not feed with a spoon, or if it is disordered in its stomach and bowels, it may be proper to seek for another nurse, taking care to procure one that is healthy. She ought to see that the child is not infected with any dangerous complaint; because it may be communicated to her by suckling the infant:—or a disease may be communicated from her to the infant, if she has any disagreeable infection, not only by her milk, but by spoon-food, many having the nasty practice of first putting
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ing the spoon into their own mouth, and then into the child's.

Healthy women, who accustom themselves to exercise, bring forth children more robust than those that are delicate. A child ought to be put to the breast within ten or twelve hours after it is born; this will excite the milk to flow sooner than could be expected, and tend to prevent a fever.

Wet nurses ought to eat one meal of animal food in a day, with a proper quantity of vegetables; broth, or milk, are proper for their suppers and breakfasts: and they should abstain from acids, because they will cause their milk to curdle, and generate griping pains in the stomach and bowels of infants. If a child is afflicted with acidities in the *prime vie*, let it take freely of *magnesia alba*; about eight or ten grains may be given at a time, in a spoonful of milk and water; or, three or four drops of the spirits of hartshorn may be exhibited in the milk, &c. The child may also take fresh broth once in a day, without any fat.

When children are fed, to prevent strangulation, their heads and bodies ought to be raised almost erect, and not suffered to lie in a horizontal posture, as is too often the practice among ignorant nurses.

Gentle exercise is very beneficial to infants; it preserves and restores their health, and makes them vigorous when they grow up.—But let us observe,

1. That this exercise ought to be very gentle.
2. That the hoisting and tossing of an infant up and down with violence, hinders digestion; generates

rates acidities, gripings, convulsions, &c.; may break or bend its tender ribs, and expose it to pain when the cause is not thought of.

3. That children should not be kept too warm in bed, nor be nursed in a small room, because too small or crowded rooms cause a relaxation, and subject them to colds when exposed to the open air.

4. When they are dressed and undressed, their bodies should be gently rubbed before the fire, to promote a free circulation.

5. If an acid in the stomach and intestines produces fits, griping pains, nauseas, vomitings, &c. give from five to ten drops of antimonial wine. If it doth not operate in half an hour, repeat the dose. It commonly proves emetic and cathartic, and does much good to the infant. After the operation, make free use of the *magnesia*.

6. That young children should not be fed after bed-time, nor forced to eat when they seem to have got enough.

7. Do not awake a child when it is asleep, because it will make it sick and peevish: but divert and keep it awake in the day-time, and then it will rest in the night.

8. When teeth begin to appear, give a child a piece of flesh to chew, every now and then; but see that it does not choke itself.

9. Be careful of exposing an infant to the cold air: when it is carried abroad, let it be sufficiently clothed; and let not the nurse sit still with it in the wind, but let it be kept in motion, to preserve it from taking cold.

C H A P. XLIV.

Of PHYSIOLOGY.

A Definition of ANATOMY—Of the Bones, Cartilages, Ligaments, Fibres, Membranes, Muscles, Glands, Tendons, Arteries, Veins, Nerves, Teguments, Teeth, and Nails, which belong to the Human Body.

PHYSIOLOGY is the history of the human frame; and Anatomy consists in an accurate dissection of all its parts, in order to make known their situation, figure, connexion, structure, and mutual relation to each other, for the benefit of Philosophers, Physicians, and Surgeons. I shall therefore treat of the Solids and Fluids, with the vital, natural and animal functions of the body.

The first anatomical production that was printed in English, was published by Mr. Thomas Vicary surgeon in London, about the year 1548; and since his time, a number of ingenious Physicians and Surgeons have made great discoveries and improvements in the art, which have done honour to their profession.

I shall, in this chapter, give a short description of the Solids in the human body, and of the Fluids in the next. And,

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I. Of

I. *Of OSTEOLOGY; or, A Description of the Bones.*

A BONE is a web of solid fibres, which is composed of three substances, called *compact*, *spongy*, and *reticula*. The skin of a bone is called the *periostium*, and that of the skull the *pericranium*.

The bones form and support the whole body; they are destroyed in living animals, by the admission of the air, or by the lodging of blood upon them.

The diseases of the bones are pains, caries, exostoses, rickets, fractures, fissures, *spina ventosa*, and luxations; but fractures and luxations are produced by accidents.

There are 61 bones in the head, 64 in the trunk, 60 in the hands and arms, and 60 in the legs and feet—in the whole 245.—But some Anatomists reckon 248; and others, 249; besides the *ossa sesamoidea*, which are very small bones that are found in the joints of the hands and feet, being in the form of sesamum seeds. They are 48 in number, according to some Anatomists; but others reckon not so many.

The names of the Bones, with their number, are as follows, *viz.*

I. *The Bones of the Head.*

LATIN NAMES.	ENGLISH NAMES.	No.
<i>Os Frontis,</i>	The bone of the forehead,	1
— <i>Occipitis,</i>	In the back of the head,	2
<i>Ossa Parietalia,</i>	Two bones in the upper part of the head,	2
— <i>Temporum,</i>	The temple bones,	2
<i>Ossicula Auditus,</i>	Little bones of the ears,	8
<i>Os Ethmoides,</i>	Bone between the eyes,	1
		Os

LATIN NAMES.	ENGLISH NAMES.	No.
<i>Os Sphenoides,</i>	It runs into the basis of the skull from one temple to the other	1
<i>Offa Mala,</i>	The bones of the cheeks,	2
— <i>Maxillare,</i>	The jaw-bones, -	2
— <i>Unguis,</i>	The inner bones of the eyes,	2
— <i>Nasi,</i>	The bones of the nose,	2
--- <i>Palati,</i>	The bones of the palate,	2
<i>Vomer,</i>	A bone just above the palate,	1
<i>Maxilla Inf.</i>	The bone of the lower jaw,	1
<i>Dentes Incisivi,</i>	The upper and under fore-teeth	8
--- <i>Canini,</i>	The dog teeth, -	4
--- <i>Molares,</i>	The grinders, or large teeth,	20
<i>Os Hyoides,</i>	A bone between the root of the tongue and the top of the wind-pipe, -	1
	Total	61.

2. *The Bones of the Trunk.*

<i>Vertebrae Cervicis,</i>	Bones of the neck,	7
--- <i>Dorsi,</i>	— of the back,	12
--- <i>Lumborum,</i>	— of the loins,	5
<i>Offa Sacri,</i>	The lowest bones in the back but three, -	6
— <i>Coccygis,</i>	The lowest bones in the back	3
--- <i>Scapulæ,</i>	The bones called the shoulder-blades, -	2
--- <i>Claviculæ,</i>	The collar-bones,	2
--- <i>Costæ,</i>	The ribs, -	24
<i>Os Sternum,</i>	The great bone in the fore-part of the breast,	1
<i>Offa Innominata,</i>	Bones just above the hips, called <i>Os Ilium,</i> -	2
	Total	64.

The *Os Pubis* ought to have been added.

3. *The Bones of the Arms and Hands.*

LATIN NAMES.	ENGLISH NAMES.	No.
<i>Os Humerus,</i>	The upper bones of the arms,	2
— <i>Ulna,</i>	The great bones of the arms below the elbow,	2
— <i>Radius,</i>	The smaller bones of the arms below the elbow,	2
— <i>Carpi,</i>	The bones of the wrists,	16
— <i>Metacarpi,</i>	The bones between the wrists and fingers,	8
— <i>Digitorum,</i>	The bones of the thumbs and fingers,	30
	Total	60.

4. *The Bones in the Legs and Feet.*

<i>Offa Femoris,</i>	The upper bones of the thighs,	2
<i>Rotula, vel Patella,</i>	The knee-pans,	2
<i>Tibia,</i>	The largest bones in the legs,	2
<i>Fibula,</i>	The smallest bones in the legs,	2
<i>Offa Tarfi,</i>	Bones between the ancles and those which join the toes,	14
— <i>Metatarfi,</i>	The bones of the feet which run to the toes,	10
— <i>Digitorum,</i>	The bones of the toes,	28
	Total	60.

As the *Os Pubis* contains two bones, our number is augmented to - - 247
 Besides the *Sesamoidea*, which are - - 48
 Bones in the human body, - - 295

Bones, like other things, often receive new names.

The

The teeth are bones, whose use is to chew the food, and make it more nourishing to the body.

Of the Nails.

The nails are whitish, transparent bodies, much like horn. They are supposed to have their origin from the *papillæ* of the skin, or a continuation of the *epidermis*. Their use is to corroborate and defend the ends of the fingers and toes.

Of the Hairs.

The hairs are small round long bodies, which arise from the skin; their roots are hollow, like the roots of birds feathers. Their use is to cover and preserve certain parts from the cold. See p. 340.

Of the Skin.

The skin is an outward covering, which consists of four parts:—the first is composed of membranes and nervous fibres: the second is formed of the capillary threads of the nerves: the third is made of a mucous substance; and the fourth, or outermost part, is composed of a thin transparent sensible membrane. The use of the skin is to defend the nerves and other parts against external injuries.

II. Of SARCOLOGY.

THIS treats of the soft parts of the human body, and is divided into *Myology*, *Splanchnology*, *Angeiology*, *Neurology*, and *Adenology*.

Myology treats of the muscles.

Splanchnology, of the entrails.

Angeiology, of the veins, arteries, and other vessels.

Neurology, of the nerves. And,

Adenology, of the glands.

But before I proceed to describe those parts, I will just premise,

1. That a cartilage is a gristle, whose use is to cover the extremities of the bones, and unite them together at the joints.

2. That a ligament is a white fibrous substance, which is hard to break or extend. It serves to join and preserve the bones and other parts of the body from injuries. Those of the bones are void of sensation; but those of other parts are not.

3. That a fibre is a round oblong vessel, which is said to take its origin from the brain and spinal marrow. Its use is to convey the animal spirits to all parts of the body.

4. That a membrane is a nervous, fibrous, broad, white spreading substance; whose use is to line the principal cavities of the body, and make the veins and arteries.

5. That a tendon is the extremity of a muscle, where its fibres run into a springy strong cord. Their use is, *first*, to confine the flesh, and prevent its obstructing the motion of a limb near the joint—*secondly*, to prevent clumsiness in particular places—*thirdly*, to keep the fleshy part of a muscle near the centre of motion—*fourthly*, for the better admitting of that friction, which, in less compact

compact parts, would have been very injurious, were not the flesh braced and strengthened by the tendons.

I. Of MYOLOGY; or, *A Description of the Muscles.*

A MUSCLE is a mass of fibres covered with a membrane, and being capable of contraction and extension, is the principal instrument of voluntary motion; such as, that of the heart, veins, arteries, nerves, stomach, intestines, bladder, &c.

A muscle has a head, belly, and tail.—The head is the tendinous part, which is fixed on the joint, and is called its *origin*. The belly is the middle, or fleshy part, whose fibres are truly muscular. The tail is the tendinous part inserted into the part which is to be moved by it, and is called the *insertion*.

Let us observe, 1. That the action of a muscle will make it grow harder and shorter, it being capable of contracting till it is shortened one-third.

2. That the diameter of a muscle in action is greatly increased.

3. That if the brain is injured to a certain degree, all the muscles subservient to the will become paralytic.

4. That if the *cerebellum* is injured, all the involuntary motions cease.

5. That if a nerve or an artery joining to a muscle is tied or destroyed, the muscle becomes paralytic.

6. That irritation upon the muscles will produce motion.

7. That some muscles continue to act, after all communication with the nerves and blood-vessels is taken away.

8. That the action of the muscles is instantaneous; and, in most parts of the body, subservient to the will.

This last appearance is contrary to the opinion of some men who have been famous in anatomy; as Keil, Boerhaave, &c.

Some Anatomists make 529 muscles; others, 446; and others, 435. The subsequent Table agrees with the latter.

PARTS.	No.	PARTS.	No.
Forehead,	2	Elbows,	12
<i>Occiput,</i>	2	<i>Radii,</i>	8
Eye-lids,	6	<i>Carpi,</i>	12
Eyes,	12	Fingers,	48
Nose,	7	Respiration,	57
External ear,	8	Loins,	6
Internal ditto,	4	<i>Abdomen,</i>	10
Lips,	13	Testicles,	2
Tongue,	8	Bladder,	1
Palate,	4	<i>Penis,</i>	4
Larynx,	14	<i>Anus,</i>	4
Pharynx,	7	Thighs,	30
Hyoides,	10	Legs,	22
Under-jaw,	12	Feet,	18
Head,	14	Toes,	44
Neck,	8		
The shoulder-blades,	8		
Arms,	18		
		Total	435
			The

The muscles are so numerous, that I have not room to give a complete table of their names in this book.

II. Of SPLANCHNOLOGY; or, *A Description of the Entrails.*

THERE are two kinds of Intestines, viz. the *great* and the *small*. They are between seven and eight times as long as the whole body: those that are small, are about five-eighths of the length of the whole.

The small intestines are called, 1. the *Duodenum*; 2. the *Jejunum*; and, 3. the *Ileum*.

Those that are large, are called, 1. the *Cæcum*; 2. the *Colon*; and 3. the *Rectum*.

The intestines have four coats:—The *first*, or outermost, is a membrane called the *Peritoneum*—the *second*, is of a muscular kind—the *third*, is nervous, or cellular—and the *fourth*, is the villous, or shaggy. This last is the inner coat, in which the arteries terminate, and the veins begin. The glands of the intestines are supposed to be lodged in the third coat.

The use of the intestines is to complete digestion, to strain off the chyle, and carry off the fæces in a regular manner; all of which are performed by the peristaltic motion caused by the muscular coat.

The peristaltic motion is not constant; but takes place when the bowels are stimulated by their contents. The action of the lungs on the diaphragm, and that of the abdominal vessels, causes the stomach and intestines to discharge their contents, by the assistance of the chyle, bile, rarefied air, &c.

Anatomists

Anatomists divide the body into three cavities, called bellies; as, 1. The head, or upper belly; 2. The breast, or middle belly; and, 3. The *abdomen*, or lower belly.

The belly is divided, on the outside, into four regions; as,

1. The *epigastric*—This reaches from the pit of the stomach to the imaginary line above the navel.

2. The *umbelical*—This is the middle external region on the fore part, &c.

3. The *hypogastric*—This is the lower fore part of the belly.

4. The *Lumbaris*—This extends from the lowest ribs on each side, to the last *vertebra* of the back.

The internal regions contain the thorax, wind-pipe, heart, liver, gall-bladder, diaphragm, spleen, veins, arteries, caul, intestines, kidneys, mesentery, pancreas, urinary bladder, feminal vessels, &c.

III. Of ANGIOLOGY; or, A Description of the Veins and Arteries.

THERE are but two Arteries, *viz.* the *Pulmonic*, and *Aorta*, or *Arteria magna*. But from these a number of branches proceed, which have different names, according to their situations in the human frame. Their extremities are so very small, that they cannot be discerned with the naked eye. These extremities end in the veins and lymphatic vessels.

The

The *aorta* proceeds, with a single trunk, from the left ventricle of the heart; and at its beginning, reflects back two branches called the *coronary arteries*, which are distributed into the substance of the heart and its auricles. The *aorta* thence runs a little obliquely to the right, then turns to the left, forming a semi-circle. From the upper part of this, which is called the *aorta ascendens*, arises three branches. The trunk continued from the *aorta*, is called the *aorta descendens*, and descends through the *thorax* and *abdomen*, towards the *os sacrum*.

The three branches of the great *aorta* are called,

1. The right subclavian;—2. Left ditto;—and,
3. The left, caroted.

The pulmonary artery arises from the left ventricle of the heart; divides into two branches, one on each lobe of the lungs; and being subdivided again and again into smaller branches, they are distributed into every part of the lungs.

Some say that the arteries have five coats; as, the *vasculous*, *cellulous*, *tendinous*, *musculous*, and *nervous*. Others suppose they have but three in a human body, though those of an ox actually have five. The names of the numerous branches I shall not mention.

These vessels are subject to inflammations, ulcers, polypuses, aneurisms, ossification, &c.

The use of the arteries is to convey the blood from the heart to all the extremities of the body. They have two motions: the one is called *diastole*, and the other *systole*, that is, a dilation and a contraction.

The

The veins are thin, ramifying, elastic tubes; which arise from the extremity of the body, and terminate in the heart or liver: They begin where the arteries end. Their coats are the same with those of the arteries, only they are thinner.

There are three kinds of veins, *viz.* the *vena cava*, the *pulmonary* veins, and the *vena portæ*.

Their use is to return the blood from the arteries to the heart. In general, they are called by the same names as the arteries they accompany.

IV. Of NEUROLOGY; or, a Description of the Nerves.

IN describing the Nerves, I shall mention,

1. That they are round, white, smooth bodies, like a cord; being the productions of the brain, and the organs of sense and motion.
2. That they are continuations of the medullary substance of the brain; and, like the same, have a great number of blood-vessels dispersed about them.
3. That they receive their strength from the membranes, by which they are surrounded.
4. That they have two coats, one from the *pia mater*, and the other from the *dura mater*.
5. That from the head there proceeds 10 pair of nerves, and from the spinal marrow 24, making 68 in the whole. Some, however, say there are more; but be that as it may, they spread into branches, and are dispersed over the whole body.
6. That

6. That those which subserve the vital functions, arise from the *cerebellum*;—those subservient to the senses, proceed chiefly from the basis of the brain;—and those which produce the voluntary motions, are principally from the spinal marrow.

I saw *Dr. Monro* demonstrate in the College of Edinburgh, in Scotland, that when a nerve is cut, compressed, or destroyed, all motion, sensation, and nutrition in the part where the nerve is situated, is lost. However, if the principal nerves are not destroyed, the parts will recover their health and vigour. But if the *cerebrum*, *cerebellum*, and *medulla spinalis*, are either of them wounded, the patient dies instantaneously. All nerves whose position are below a wound in the *medulla spinalis*, lose their sense and motion.—A limb may lose its motion, and yet retain its sensation; or it may lose its sensation, and not its motion, for sensation will remain some time after a member has been amputated; and pressure will make a part palsy.

The use of the nerves is to convey an exceeding fine fluid from the brain to all the extremities of the body. This fluid is called the Animal Spirits, and is the cause of sense and motion.

V. OF ADENOLOGY; or, A Description of the Glands.

THERE are two kinds of Glands, *viz.* the *simple* and the *compound*. The former is called *conglobate* or *lymphatic*, and the latter *conglomerate*.

The simple consist of elastic, circular fibres, which impel the lymph and chyle into their proper ducts. The compound have each of them a lesser

lesser canal, which being continued, forms a larger; and they have excretory vessels, through which some particular fluid is to pass. Those fluids differ from each other, as they consist of saliva, bile, the nervous fluid, urine, mucus, sweat, milk, &c.

The glands have different names, according to their various situations in the body and limbs; which are as follows:

1. Of the Brain, The pineal and the pituitary.
 2. — Mouth, — parotid, maxillary, sublingual, labial, buccal, palatine, amygdalæ; and externally, the epiglottis and pharynx.
 3. — Eyes, — lachrymal.
 4. — Nose, — pituitary.
 5. — Ears, — ceruminous.
 6. — *Thorax*, — thymus, bronchial, tracheal, arytenoidal, and thyroidæal.
 7. — *Abdomen*, — pancreas, liver, kidneys, stomach, intestines, &c.
 8. — Secrets, — uterine, sebaceous, &c.
- All these are *conglomerate* glands.

The *conglobate* are those of the head, *thorax*, *abdomen*: those of the latter are called gastric, hepatic, cystic, splenic, epiploic, lumbar, mesenteric, iliac, and sacred.

The conglobate glands are also found in the extremities of the body; as the axillary, crural, &c. The use of the glands are to secrete and separate the fluids, just as the kidneys separate the urine from

from the blood; they are of the conglomerate kind: and those of the arm-pits, groins, and myfentery, which perfect the *lymphæ*, are conglobate, &c.

VI. *Of the LYMPHÆDUCTS and LACTEAL VESSELS.*

THE Lymphatic System consists of the lacteals, lymphatic vessels, the conglobate glands, and the thoracic duct.

The Lymphæducts are slender pellucid tubes, which arise from all parts of the body, and permit a thin transparent liquor to pass through them towards the heart, &c.; for the course of the lymph, and that of the chyle, is from the circumference of the body to the centre.

The Lymphatics are commonly situated close to the large veins and arteries in the extremities of the human frame.

The Lacteals are slender pellucid vessels, dispersed in great numbers through the myfentery. They begin at the intestinal tube; and all of them, with most of the lymphatics, open into the thoracic duct, which lies upon the spine, and runs up towards the neck, where it commonly opens into the angle between the jugular and the sub-clavin veins of the left side; and thus both the chyle and the lymph are mixed with the blood.

The Lacteals are the absorbents of the bowels, and the Lymphatics are absorbents in other parts. Hence, as both are absorbents, and terminate in one

one duct, they are alike ; only they are differently situated. The coats of these vessels are thin and transparent, being much crouded with valves.

Any compression upon the thoracic duct, will bring on an atrophy and death.

The *vasa chyli* are called *vena lactæ*, because their valves are disposed as those of the blood-veins are, and because, like them, they convey their contents from the smaller to the larger tubes.

C H A P. XLV.

Of the FLUIDS in the Human Body; viz. The Chyle, Blood, Bile, Saliva, Tears, Urine, Perspiration, Pancreatic Juice, Mucus, Milk, Sebaceous Humour, Cerum, Spiritus Animalis, Amygdalæ, Gastric Fluid, Lympha, Phlegm, &c. The Vital, Natural, and Animal Functions.

I. *Of the CHYLE.*

THE chyle is a milky fluid, extracted from what we eat and drink by means of digestion. In general, it is a juice inspissated to a middle consistence between moist and dry. It seems to consist of oil, mucilage, water, a coagulated part, and fixed air.

When the aliment is converted into a fluid state, the oily part mixes with the *saliva*, and the juices in the stomach and *duodenum*, till it becomes like milk. This mixture is called chyle; and the bile mixing with it in the *duodenum*, assists in separating the nutritious chyle from the excrementitious part, and the former is conveyed by the lacteals into circulation, to be converted into blood, milk, &c.

When the chyle enters the blood, it does not immediately mix with it, but, in some intestines, passes in a separate state through the whole circulation.

lation. I have frequently seen it floating upon the surface of the blood, when I have bled a patient; and in the last stage of a *diabetes*, the chyle may be seen in the urine.

II. *Of the BLOOD.*

IT has been demonstrated by a chymical analysis, that human blood contains,

1. A fine chalky earth.
2. A portion of fixed air.
3. A quantity of elementary fire.
4. A quantity of water.
5. A quantity of sea-salt.
6. A quantity of acidous gas.
7. A number of volatile particles, like those of sal-ammoniac.
8. A small quantity of iron, which the loadstone will attract.

These earthy, airy, igneous, aqueous, salineous, acidous, volatile, and ferruginous particles, are derived from the four elements, and those things which nourish and support the human frame. Dr. William Harvey, of Kent, in England, discovered the circulation of this fluid, in 1657.

The blood is capable of imbining the infections which float in the air, and also the poisons of minerals, vegetables and animals.

This fluid is contained in the veins and arteries; the arteries convey it from the heart to all the extremities of the body; and the veins convey it back again to the heart.—As mentioned before, it circulates,

circulates, at a medium, with a velocity equal to about fifty-two feet in a minute. But the circulation is quicker in young persons, than in those that are old: hence small children will live longer in the cold, than the aged. The arteries have a pulsation, like the heart; and when they are cut, the blood will spirt out with a very unsteady motion; but when a vein is opened, the blood will run with a steady stream: but it runs with a greater velocity in the arteries, than in the veins.

Two great arteries, called the *aorta* and the *pulmonic* artery, distribute the blood to the extremities of the body. The first arises from the left ventricle of the heart, and extends itself in different branches to the most distant parts of the human frame. These branches have divers names, as *aorta ascendens*, *aorta descendens*, &c.

The *pulmonic* artery rises from the left ventricle of the heart, runs upwards to the left *aorta*, and is divided into branches. The blood is returned back to the heart by three sorts of veins, *viz.* the *vena cava*, the pulmonary veins, and the *vena portæ*. Vid. ANGIOLOGY, p. 378.

When the blood is taken from a patient, the volatile particles fly off in the form of a steam; and what remains, congeals into a trembling mass. The greatest part of this mass is called *crassamentum*, which is red, and gives that colour to the other parts of the blood. If the *crassamentum* is separated from the watery part, the remainder becomes inflammable.

The globules of the blood are elastic, and they preserve the heat of the body: a redundancy of them creates acute fevers, inflammations, &c. and their deficiency generates chronic disorders.

The *serum* of the blood is a crust that rises on its surface, after it is taken by phlebotomy, &c. The *serum* generates nutrition; and the secretions that flow from it, moisten the surface of the body, and preserve the flexibility of the solids.

The red colour of the blood is supposed to be produced by an acid it receives from the air, in the lungs; but Dr. Hunter imputed it chiefly to the degree of its condensity.

Obstructions in the circulation of the blood, may be produced by a redundancy or a deficiency in that fluid. Cold water drank when people are hot, a too free use of acids and spiritous liquors; sudden frights, grief, terror, fear; the apoplexy, epilepsy, spasmodic asthma, pleurisy, peripneumony, convulsions, hysterical and hypochondriac complaints, with other acute distempers, and several chronic disorders, will produce obstructions in the sanguinary vessels.

The blood is called the life of all animals; for when it is exhausted, they die immediately. Coagulations and concretions of the blood send off many ramifications to the neighbouring vessels, which lays a foundation for a number of disorders. It is dangerous to have too much blood, and also to have not enough. When the veins and arteries are too full, bleed; when too empty, live upon a nourishing diet.

When the life of a patient is in danger, by a hemorrhage, from a wound or any other cause, apply styptics immediately, and press the parts together with your hand. If it has not the desired effect, let a Surgeon take up the vein, or artery, with an arterial needle. A cooling balsamic regimen, and nitrous preparations, will be beneficial.

Some apply the following styptic to the part from whence the hemorrhage proceeds, *viz.* Take of the powder of burnt allum, half a drachm; of the powder of dragons blood, one drachm; mix: and apply it as occasion may require.

The *volatile flour alkali* has lately been discovered at Naples, to be a fovereign *styptic*.

III. *Of the B I L E.*

THE Bile is a thick, yellow, bitter liquor, composed of aqueous, salineous, rosinous, and sulphurous parts, which are separated from the venal blood by the liver; it is brought thereto by the *vena porta*, from the spleen, stomach, intestines, and epiploon. It is collected into the gall-bladder, and discharged from thence into the lower end of the *duodenum*. Ten parts of the bile, out of twelve, has been found to be water.

It is the least putrescent of any of the animal fluids, and is capable of dissolving almost all kinds of animal and vegetable substances. Hence it mixes with the chyle, rouses the peristaltic motion of the intestines, and completes digestion. An excessive use of acids will produce indigestion, by overcoming the qualities of the bile.

The stones formed in the gall-bladder, are generated by the coagulation of the bile, and are of an unctuous inflammable nature. They undoubtedly rise from the too free use of acids; but the vegetable acids, used with moderation, is a great antidote against the putrefaction of the bilious fluid.

When the bile is vitiated, it produces crudities in the *prime vie*, nausea, jaundice, flatulencies, costiveness, cachexy, fevers, consumptions, dropsies, &c.

The putrescency of the bile increases fevers, and makes them malignant and putrid. Hence it ought to be evacuated by emetics; and antiseptics ought to be exhibited before it is too late, otherwise an end will be put to the life of the patient.

The bilious ducts have different names; as, *Ductus Hepaticus*, *Ductus Cysticus*, &c.

IV. *Of the SALIVA.*

THIS is an aqueous, saline, oily fluid, which is separated from the blood by the salivary glands situated in the mouth. This fluid is almost without taste or smell: It is thin and pellucid, being incapable of being concremented by fire.

By chewing, it flows from the glands, mixes with our food, and promotes digestion. In hungry persons it becomes acrid, penetrating, and resolvent. Too much spitting causes a thirst, loss of appetite, bad digestion, and an atrophy.

V. *Of the TEARS.*

TEARS are an aqueous, subtile, limpid, saline fluid, which is separated from the arterial blood

blood by the lachrymal glands; their use is to moisten and deterge the eyes.

VI. *Of the URINE.*

THIS is a fluid secreted from the blood by the kidneys, is conveyed by the ureters to the bladder, and from thence discharged from the body through the *urethra*. If it is retained too long in the bladder, it turns putrid, and endangers the life of the patient. Sometimes it has passed off through the cutaneous pores, when it could not find vent the natural way.

A suppression of urine often produces spasms, pains, inflammations, jaundice, loss of appetite, faintness, tremors, cold sweats, and putrid disorders.

A total suppression is called an *Ischuria*.

A partial, ————— *Stranguria*.

If the latter is attended with great heat, *Dysuria*.

When there is a total suppression, it ought to be drawn off with a catheter, if the patient cannot be relieved by bleeding, fomentations, anodynes, diuretics, enemas, nitrous preparations, &c. Sometimes, after bleeding, I have observed that emetics and gentle cathartics have been of great service.

Some have pretended, that they could tell, by seeing the urine of a patient, what disorder he was afflicted with, and that they could prescribe proper remedies without any further knowledge; but this is judged by men of learning and skill to be an imposition, because the same kind of urine is not always discharged in the same disorders.

I have been credibly informed, that a foreigner who practised that way in America, had some urine brought to him that had been taken from a swine. After he had viewed it for some time, he cried out, "By God, dis woman is with child!" This is an evident proof that he was an impostor: and I believe it may not be improper to rank such practitioners with the conjurers and fortune-tellers; for, though they may guess right sometimes, yet they may often be deceived, and prescribe remedies that are very improper for those that need relief.

The urine contains,

1. A microcosmic salt, which is found in no other fluid.
2. A marine salt.
3. If distilled, it yields only a volatile salt; and,
4. An empyreumatic oil; and also,
5. A peculiar kind of phosphorus.
6. A quantity of water, &c.

VII. *Of the Perspiration.*

PERSPIRATION is a steaming, or sweating, through the cutaneous pores; and the qualities of this fluid are analogous to those of the urine. Insensible perspiration is the greatest of all evacuations in hot weather; but that of urine exceeds it in winter. The perspiration cleanses the blood, by carrying off its salineous particles, to supple the skin, and preserve the body from various maladies. An obstructed perspiration produces fevers, pleurifies, peripneumonies, arthretic complaints, violent pains, diseases of the head, breast, &c. It increases

the impure humours, and generates corruption and putrefaction.

VIII. *Of the PANCREATIC JUICE.*

This is an aqueous, limpid, viscous fluid, separated from the arterial blood by the pancreas, and conveyed by the pancreatic duct to the *duodenum*. It is discharged with the bile through the *ductus choledocus*. Its use is to moisten and dissolve the aliment, to mix with and soften the bile, and to render the chyle fit for its entrance into the lacteal veins.

IX. *Of the Mucus.*

THIS is a mucilaginous fluid, separated from the blood by the glands that are seated in the pituitary membrane which covers the internal parts of the nose. Its use is to moisten and preserve the inward parts of the nostrils from being injured by the air.

Mucus is also a covering for the surface of all the membranes in the body, such as the skin, internal membrane of the mouth, lungs, intestines, urinary passages, &c. It is a compound of coagulable matter and water, which prevents the membranes from being stimulated by things which touch them.

X. *Of the MILK.*

THIS is a white fluid, separated from the blood by the glands of the breasts: it is nothing but the chyle more highly laboured.

By a chymical analysis it has been demonstrated, that it contains the same substances that are found in the vegetable kingdom. Its use is to nourish infants, &c.

Milk differs in degrees of goodness, in the following order, *viz.* 1. Woman's is the best — 2. Ass's the next best — 3. Mare's — 4. Goat's — 5. Sheep's — 6. Cow's is the worst, because it is the hardest to digest. The milk of animals which feed on green herbs, is more diluting than that of those which feed upon dry.

When milk becomes cold, it loses its excellent qualities, like most other animal fluids, and they cannot be restored by heat. Boiled milk is improper for weakly persons, and those who have weak stomachs.

If milk disagrees with a patient, a tea-spoonful of the spirits of hartshorn may be put into every pint, which will make it agreeable. Milk is not good in fevers, but it is an antidote against poisons.

New milk whey is cooling, diluting, and aperient: it is good for costive patients, and in acute rheumatisms, and for other disorders when the humours are impure, being a general promoter of the natural excretions.

XI. *Of the* SEBACEOUS HUMOUR.

THE Sebaceous Humour is an unctuous, thick, viscous matter, which is filtered by the sebaceous glands, and deposited in small bags, where it appears in black spots, and may be squeezed out in
the

the shape of little worms.—This humour forms the small scales which appear upon the skin.

Its use is to defend the skin from being injured by the action of the salts, and to render it smooth and polished.

XII. *Of the CERUMEN AURIS.*

THIS is called Ear Wax. It is separated from the glands in the ear; is moist at first, but grows harder by lying. It is bitter and viscid, and has qualities much like those of the bile.

Sometimes it causes deafness, by growing hard; but warm water will dissolve it, and often cure the disorder.—This has been found to be a better remedy than any hitherto discovered.

The ear-wax prevents insects from hurting the *membrana tympani*.

XIII. *Of the SPIRITUS ANIMALIS.*

THE *Spiritus Animalis*, or Animal Spirits, have been supposed to consist of a very thin liquor, conveyed from the blood to the external or cortical part of the brain, where it is exalted into spirit; and from thence conducted through the *medullar substance* of the brain, by the *corpus callosum*, and *medulla oblongata*, into the nerves, and in them performs all the actions of sense and motion. But the nerves are conductors which not only carry these spirits from the head, but return them back again.

Any fine volatile substance which exhales from bodies by a given degree of heat, is called *spirit*:
hence,

hence, by a sort of an imaginary analogy, the nervous fluid has been called Spirit, and is generally termed Animal Spirit.

The spirit in the human body is spoken of under different characters; as those of natural, vital, and animal.

The first presides over digestion, the elaboration of the chyle, and all the natural actions—The second, over the motion of the heart and lungs, or the vital actions;—and the third, over the animal actions; as, sensation, voluntary motion, &c.

XIV. *Of the* AMYGDALÆ.

THE *Amygdalæ*, or Almonds, are a glandulous substance, like two kernels, on each side of the *woula*, at the root of the tongue. They are called a thick humour, through which a juice is filtered that moistens the inside of the *asophagus*, and other parts, which facilitates swallowing, creates an appetite, and promotes digestion. This liquor is analogous to that of *saliva*.

XV. *Of the* GASTRIC FLUID.

THIS is the juice of the stomach, being a thin pellucid liquor, which distils from certain glands, for the dilution of food.

XVI. *Of the* LYMPHA.

THIS is a pellucid, insipid, pure liquor; the more subtle parts of which afford the matter of the fluid of the brain, spinal marrow, nerves, and also the feminal fluid.

The

The gelatinous parts of this fluid nourish all the solids; and its finer aqueous parts are, through the lymphatic vessels, by means of the valves and the conglobate glands, again conveyed to the heart, where being again united with the blood, it is with it conveyed to all the parts of the body. When eight ounces of blood have been distilled over a gentle heat, seven ounces of lymph have arose by the distillation.

XVII. *Of the PHLEGM.*

PHLEGM is a slimy excrement of the blood, often raised by taking cold, or too much nitrous air. It is also an inflammation.

XVIII. *Of FAT, or ANIMAL OIL.*

FAT is an animal oil: It is an unctuous sulphureous fluid, contained in that part of the cellular membrane called *membrana adiposa*. But how it is separated from the blood, is not certainly known.

Fat is composed of a little earth, elementary fire, acid salt, volatile alkaline salt, and water. In human fat, and the suet of beasts that chew the cud, there is a large quantity of inflammable oil, and an acid empyreumatic liquor.

By profuse sweating, the fat is melted down, and carried off through the cutaneous pores, which greatly weakens the patient.

The human fat does not become fluid when Fahrenheit's thermometer rises to 90 degrees; but

when

when it begins to putrify, a small degree of warmth will make it run into oil.

The use of this fluid is, 1. to temperate the acrimony of the salts in the blood—2. to fill up the empty spaces between the muscles, which beautifies the formation of the body—3. to render the skin flexible, smooth and soft—4. to moisten and soften the fleshy tendinous parts—and, 5. to nourish the animal at certain times.

Fats and animal oils are good to relax the parts to which they are applied, and to stop perspiration. In the present practice in London, I understand that three kinds are chiefly used, *viz.* That of vipers, hogs-lard, and mutton suet.

Fats are of an emollient quality, and good in divers kinds of ointments, as the *unguentum caruleum mitius*, *ung. caruleum fortius*, *unguentum vulgo*, *linimentum arcei*. *ung. nervinum*, &c.

Animal fats are not soluble in the spirits of wine rectified, nor in water. If they are scented with essential oils, the oils may be totally extracted by digestion in the rectified spirits of wine; and by the same means also, in a lesser degree, by water. By such operations, fats that are old may be freed from their ill smell, and made sweet.

The whale affords more oil than any creature belonging to the animal kingdom. It has been said, that some of them will yield 120 barrels.

Of

Of the Vital, Natural, and Animal Functions.

HAVING given a short description of the greatest part of the Solids and Fluids in the human body; I shall now proceed to say something further concerning their action and re-action on each other, or the vital, natural, and animal functions. These I shall describe in their order. And,

I. *Of the VITAL FUNCTIONS.*

THESE consist of the circulation of the blood, the action of the brain, and the respiration.

On the action and re-action of the solids and fluids, the vital functions depend; for, the circulation of the blood from the heart, through the arteries, to the extremities of the body, and its return to the same again by the veins, produces a motion which is caused chiefly by the dilation and contraction of this organ; and whenever this motion totally ceases, life is come to an end.

The action of the brain separates a very subtile fluid from the blood, called Animal Spirits, which are conveyed by the nerves into all parts of the body. They pass in an instant, at the command of the will, from the brain to the extremities of the body, and back again with the same velocity. The brain is the reservoir of this fluid, by which the soul has a perception of objects, and performs all the bodily actions.

Respiration

Respiration is composed of two motions, called, Inspiration, and Expiration: by the former, the air is received into the lungs; and by the latter, it is returned back again. The air is heated by entering the breast; and if the weather is cold, it will be condensed, and appear in the form of a vapour, as it returns into the surrounding atmosphere.

Respiration is the cause of speaking, laughing, sighing, coughing, sneezing, yawning, sucking, &c.

II. *Of the* NATURAL FUNCTIONS.

THE Natural Functions are, manducation, deglutition, digestion, nutrition, growth, generation, secretion, and evacuation.

Manducation, is the chewing of our food.

Deglutition, is the swallowing of the same.

Digestion, is a change of the aliment into chyle, by its mixing with the bile and the pancreatic juice, and the action of the intestines.

Nutrition, is the repairing of the continual loss which the different parts of the body sustain; for life is destructive of itself, as its very offices cause a constant waste. The motion of the parts of the human frame, the friction of these parts upon one another, and especially the action of the air, would destroy the body entirely, if the loss was not repaired by materials of the same kind of those carried off by evacuations.

Growth, is an increase of the body by the nutritious juices.

Generation,

Generation, is the production of any thing in a natural way, which was not in being before.

Secretion, called Excretion, is the separation of some fluid mixed with the blood, by means of the glands; or, in other words, it may be called the separation of one fluid from another.

Evacuation, is produced by the peristaltic motion of the bowels, emetics, cathartics, diuretics, diaphoretics, &c.

III. *Of the ANIMAL FUNCTIONS.*

THE Animal Functions are the muscular motions and voluntary actions of the body: they constitute the senses of feeling, tasting, smelling, seeing, hearing, perceiving, reasoning, imagining, remembering, judging, with all the affections of the mind.

The muscles are the organs of the voluntary motions: they act chiefly by contracting or shortening the fleshy fibres. This contraction, by drawing the tendons or tails of the muscles, to which the moveable bones are connected, moves the solid parts; and by lessening the cavities of certain hollow muscles, such as the heart, intestines, and other vessels, it causes the motion of the fluids.

The instruments of the involuntary motions, are the nervous and musculous or fleshy tunics, composed of fibres: they consist of all kinds of vessels, through which the fluids circulate.

The involuntary motions are those which are produced without the consent of the mind; such

as, the beating of the heart, pulsation of the arteries, convulsions, &c.

Feeling is produced by the application of bodies to the nervous *papillulae* of the skin; and from hence proceed the sensation of heat, cold, moisture, dryness, softness, hardness, roughness, tickling, pain, &c.

Tasting proceeds from the touching of things to the *papillulae* of our tongues: hence we know whether a thing is bitter, sweet, salt, or sour, &c.

Smelling arises from the entrance of exhalations into our nostrils, and their striking a nervous membrane which covers the internal parts of the nose: hence we distinguish one thing from another by the smell.

Seeing is performed by the expanded membrane of the optic nerve, called the *retina*. The rays of light which proceed from all points of external objects, pass through the transparent part of the eye; and after having undergone various refractions in the *aqueous*, *vitrous* and *crystalline humours*, they fall upon the *retina*, which is the immediate organ of sight, and forms the image of the object.

Hearing proceeds from the different agitations of the air caused by sounding bodies. These agitations pass through the external part of the ear to the *tympanum* or drum, to the air contained in the turnings and windings of this organ, 'till it is communicated to the interior membrane of the auditory nerve.

Perceiving is a clear and distinct apprehension of objects: it is produced by the extension of the nervous membranes.

Reasoning is an arguing upon a subject, in a just, right, and rational manner: this is produced by a perfect understanding arising from the organs of the senses being in good repair.

Imagining is a faculty by which we picture bodily substances in our minds, as though we actually saw them with our eyes; being conceit, fancy, thought, &c. It may be sometimes true, and sometimes false.

Remembering is a calling to mind, or having in one's memory, something past, present, or to come.

Judging is the trying of causes, the making up of a judgment, and the determination of things in one's mind.

As to the *affections* of the mind, they have already been mentioned. Vid. p. 212.

Having thus described the vital, natural, and animal functions, I will just observe, that Anatomists do not agree in some things, and therefore frequently contradict one another, owing no doubt to new discoveries that have been made in these latter days. I have endeavoured to calculate the preceding account of the Solids and Fluids according to the latest discoveries; and hope that what I have written will prove profitable to those who may be inclined to obtain a general idea of the construction of the human frame, which, by the the *Divine Artificer*, is fearfully and wonderfully made!

C H A P. XLVI.

Of AGRICULTURE—Thoughts on Vegetation, and of the Rise of Sap in Trees, Plants, and Herbs—The Farmer and Gardener's Calendar.

AGRICULTURE is the Art of Husbandry, and consists in the improving of lands in the best manner, in order to make them produce large crops of grain, hay, &c.

GARDENING consists in the dressing of ground, and in the raising of a variety of plants and flowers, &c.

The Art of Gardening, according to the Scriptures, is almost as old as the creation; for the LORD GOD, having planted a garden eastward of Eden, did put Adam into it, to dress and keep it. *Vid.* Gen. ii. 8. 15. But, according to Chronology, this Art was invented by Queen Elizabeth, who reigned in England about the year 1559.—It also appears by the Scriptures, that Agriculture is nearly as old as Gardening; for Cain was a tiller of the ground, *Vid.* Gen. iv. 2. But Chronology tells us, that it was invented by Triptolemy, about 1600 years before Christ.

These excellent Arts are very beneficial to mankind, as a great part of our food and raiment is derived from them; and the King himself is served by the field. Were the farms and gardens to lie uncultivated, a great part of the people would perish with famine. Hence nothing can be of greater

greater importance as to our temporal felicity, than the cultivation and improvement of these useful Arts.

I shall treat, in the *first* place, of Vegetation; and *secondly*, give some important directions concerning the management of farms and garden: in the middle governments in North-America; which may be of great service in other States, providing a proper allowance shall be made for the difference of climates. Hence, in those which are colder than the middle governments, directions for March, April, May, &c. must be observed later in the season, but earlier in those which are hotter.

I. Of VEGETATION.

VEGETABLES proceed from seeds of the same species; though some have been otherwise minded, because they have supposed that some plants have no seed. It is true, indeed, that some are male, and others female; as, *felix mas*, male fern; *felix femina*, female fern, &c. The female produces fruit and seeds, but not the male. Some plants bear flowers, which never bear any fruit; and others bear fruit, without flowers.

Plants are distributed into 28 classes, by Ray; as,

1. Funguses, which seem to have neither flowers nor seed.
2. Submarine plants; as, sponges, &c.
3. Mosses.
4. Capillary herbs—These have no main stock or stem, but their leaves arise immediately from their roots; as, harts tongue, &c.

5. Herbs with an imperfect staminous flower ; as, jointed glass-wort, marsh-sapphire, &c.

6. Herbs with a compound flower, full of a milky substance ; such as, the different kinds of wild lettuce, &c.

7. Herbs not milky, with compound flowers, and a downy feed ; as, colts-foot, &c.

8. Herbs with a compound discoride flower, with seeds not downy ; as, corn-marigold, common ox-eye, &c.

9. Herbs with a flower compounded of fistular *fosculi*, or capitated herbs ; as, *carduus*, different thistles, bastard saffron, &c.

10. Herbs with a simple perfect flower, with naked solitary seeds, or single seeds in single flowers ; as, small and wild valerian, corn salad, &c.

11. Umbelliferous herbs, whose flowers grow on the top of their stalks ; after which, grows two naked seeds, which are joined together in each flower ; as, cow parsnips, &c.

12. Stellated herbs, whose leaves encircle their stalks by intervals ; as, cross-wort, wild madder, &c.

13. Rough-leaved herbs—These have their leaves set upon the stalks in no proper order ; as, bugloss, cowslips, great hounds-tongue, &c.

14. *Suffruticos* and verticillated herbs—These have two leaves on the stalk, placed one against the other, and every flower produces four seeds ; as, the common mother thyme.

15. Polyspermous herbs, with naked seeds—These have more than four seeds in a flower ; such as, the lesser celandine, &c.

16. Bacciferous herbs—These are those whose fruit,

fruit, when ripe, are clothed with a thin membrane, containing a soft moist pulp. These fruits are called berries; as, cloud berries, bramble berries, &c.

17. Multifluous or corniculated herbs—Each flower of this kind produces two pods, such as periwinkles, house-leek, &c.

18. Herbs with a single dry fruit, and a monopetalous flower; as, common henbane, marsh gentian, &c.

19. Vasculiferous herbs, with a dipetalous and tritapalous flower; as, the enchanter's night-shade, water-wort, or star, headed water chickweed, &c.

20. The same as the former.

21. Terapetalous, siliquous, and filiculous herbs; as, the great sea stock gilliflower, &c.

22. Vasculiferous herbs, anomalous, with a tetrapetalous flower; as, the wild poppy, red poppy or corn-rose, &c.

23. Leguminous herbs, or with a papilionaceous flower—These flowers resemble the expanded wings of a butterfly; such as, the different kinds of pease, &c.

24. Pentapetalous vasculiferous herbs—These have two leaves set against each other on the stalk; as, maiden pinks, common pinks, Deptford pinks, &c.

25. Hexapetalous, and pentapetalous, vasculiferous herbs; as, the small hedge hyssop, water lily, &c.

26. Herbs with bulbous roots; as, different kinds of garlies, &c.

27. Culmiferous grass-leaved herbs, with an imperfect flower; as, spiked grass, dog grass, &c.

28. Grass-leaved herbs, not culmiferous, with

an imperfect or staminous flower; as, the great vernal cyprus grafs, &c.

Trees and Shrubs are also differently distributed into classes.

Those of an apetalous flower at a distance from the fruit, are,

1. The nuciferous; as, the walnut-tree, &c.
2. The coniferous; the female or yew-leaved fir-tree.
3. The bacciferous; the juniper-tree, &c.
4. The lanigerous; as, the several kinds of poplar trees, &c.
5. The foliaceous vessels; the horn-beam, &c.

Of Trees and Shrubs with the Fruit contiguous to the Petaloid Flower.

THOSE that have the flowers seated upon the top of the fruit, are such as pomiferous and bacciferous trees; as, the apple, pear, and crab trees, &c.; the apple-rose, currants, &c.

Trees whose flowers adhere to the bottom of the fruit, which is moist when ripe, is called *pruniferous*. Of this kind are the common, black, and wild cherry-trees, and the like.

Trees with the flowers growing at the bottom of the fruit, which is dry when ripe, are the bladder nut-tree, the common elm, wych, hazel, &c.

Having given the preceding short description of the different genus's of plants, &c, let us observe,

1. That every vegetable must spring from seeds of the same species, though they may be very small.
2. That seeds may be carried to a great distance from the places where they grew, by the wind,
and

and by the birds and beasts, and thus be planted in an uncultivated wilderness.

3. That some seeds may lie 40 or 50 years in a dry place, and afterwards spring up, if moisture gets to them.

4. That the vegetable productions derive the greatest part of their weight from the moisture of the earth, and the circumambient air, is evident, because the growth of a willow in 200lb. of earth, gained, in five years, 164lb. 3 oz. and only imbibed two ounces of that element. Hence air, fire and water, must make the other part of the bulk.

5. That when a seed is sown, the parts thereof is in *embryo*. It begins to vegetate by the heat of the sun, and the surrounding moisture; every part swells, the external part unfolds and dilates, till at last sprouts come forth out of their native bed: one or more of these sprouts run downward, and are called roots; and one or more of them grow upward, and produce stalks, or a tree, according to the nature of the seed.

6. That the bark of the roots, being spongy, imbibes and sucks up moisture from the earth, which impregnates the vegetable with those principles on which its life and growth depends. This moisture abounds with oil, alkaline salts, alkaline earth, &c.

7. That this moisture is called sap; which being distributed through the roots, supplies their organical parts with those principles of nutrition which every one requires. Hence they grow larger, and more solid, as their age advances.

8. When the roots are thus formed, with their
organs

organs of vegetation, they draw from the earth, through their vessels, proper vegetable juices, which they communicate to the seed plant, and thereby cause it to unfold all its blades, and shoot forth branches, buds, leaves, flowers, and seeds, from the different parts of its stalk or trunk.

9. The sap ascends the first year of the growth of the plant, by the vessels of the pith; after which the pith grows dry, and remains so. Afterwards the sap rises in the wood; and lastly, in the bark.

10. That the sap ascends, in the spring, to all the extremities of a tree or plant, and descends into the roots in the autumn. Though some will not allow that the sap hath any circulation at all; but I am sure they are mistaken, because I have often seen maple-trees tapped, which have yielded a barrel of juice; and how could the juice run out if it had no circulation?

11. Some have supposed, that the sap rises every month in the year; and I have thought, that the moon may have some influence on the vegetable fluids, at the time of the spring tides, as well as upon the waters of the sea, and the atmosphere. But, in cold countries, where the trees are froze hard in the winter, it is not probable, that whilst they are in that condition, the sap can have much circulation when the spring-tides happen.

12. The sap in some vegetables has a slow circulation, which generates and makes it appear like milk, and is of an oily balsamic quality. But when the sap is strained more freely through each organical part, it appears like clear water. All vegetables perspire in a greater or lesser degree; in
warm

warm weather ; the heat and air within them tends to generate a kind of fermentation, which keeps the fluids in motion. Many vegetables emit an effluvia, called *odours*, which consists of very fine invisible particles, that fly off in all directions, and being received into our nostrils, produce the sensation of smell.

Vegetables cannot exist without air and nourishment, any more than animals. Their greenness is attributed to a portion of iron imbibed from the earth, &c.

The Farmer and Gardener's CALENDAR.

JANUARY.

1. CUT your wood in the first quarter of the moon ; improve the sledging, and get a plenty of fuel for the following year.

2. See that the vermin do not destroy your grain and vegetables.

3. Cut timber for building, fencing, &c. in the last quarter of the moon, to prevent its rotting.

4. Let not your horses stand in the cold, when they have been heated with exercise ; and keep your cattle warm and clean, and see that they have water in season.

5. Sweep your chimnies often, to prevent your houses from taking fire.

6. Go to bed in season, and rise early : this will save your candles and fire-wood.

FEBRUARY.

1. PRUNE your orchards and forests.

2. Sow

2. Sow pease, if the weather will permit.
3. Get your tools ready to do your spring work.
4. Look over your garden-seeds, and see that they are not injured by the moisture, or by the frost.
5. Cut timber for building in the old of the moon, if you did not cut enough last month.
6. When the snow is gone, put your sleighs and sleds, with their tackling, into a tight and dry place, to prevent their being damaged by the rain.
7. Take good care of your sheep and lambs.
8. Plow your grass land, if the frost is out of the ground; the clods will rot sooner than at any other time in the year.

MARCH.

1. REPAIR your fences.
2. Graft or inoculate young trees, and set them out for an orchard.
3. Sow tobacco, cabbage, parsnip, carrot, onion seeds, &c.
4. Plow your ground for your flax, wheat, rye, oats, and barley.
5. Plant potatoes, Indian corn, pease, &c. with such other vegetables as may be wanted before fall, early in the spring; those for winter may be planted later.

APRIL.

1. SOW your flax-seed, and spring grain, as early as possible.
2. Dung and plow your ground, for the planting of Indian corn, potatoes, beans, pompkins, melons, cucumbers, &c.

3. Plant more Indian corn, potatoes, &c.
4. Look well to your garden, sow seeds, and transplant roots, &c.

MAY.

1. PLANT corn, potatoes, beans, pease, lettuce, rosemary, lavender, thyme, with all kinds of seeds that were not planted or sowed in February, March, and April.
2. Weed your garden, hoe your corn, fet out your cabbage and tobacco plants, and water your new-grafted trees, if the weather is dry.
3. Wash and shear your sheep, hive your bees when they swarm, and see that your vegetables are not destroyed by the cattle, or by insects.
4. Bleed the cattle you intend to fatten.

JUNE.

1. HOE Indian corn, weed your garden, and kill black flies, worms and spiders, which devour your plants, by the fumes of tobacco, conducted to those vegetables through some proper pipe, or tube.
2. Plant Indian corn, beans, pease, melons, and cucumbers, for use in the fall.
3. Water your plants in the evening, or early in the morning, if the weather is dry. Watch your bees, lest they swarm, and fly away, for the want of a new hive.
4. Begin to mow grass, as soon as it is ripe, or in the bloom; rake and cock your hay every evening before the dew falls, spread it out the next morning, and cart it into your barn as soon as it is fit; but let it not be dried too much. Keep your barn-doors shut tight, to prevent the ingress

of

3. Plant

of the air, for a free admission of that element will cause the hay to generate heat by fermentation, and make it musty, and sometimes cause it to take fire; but if it is kept from the air, it will look green, and have an agreeable flavour the next year.

5. Plow the land you design to sow with winter grain. The grass should be plowed in; and the more there is of it, the more will the ground be enriched.

6. Gather cherries, currants, strawberries, gooseberries, &c.

JULY.

1. CONTINUE to get in your hay; let not your grain stand too long, lest it should waste by the blast, but get it into your barns in season.

2. Hill your Indian corn, and sow pease and turnips for the fall and winter.

3. Turn bulls to store heifers; lay up herbs for winter, when they are in their bloom.

4. Destroy the weeds in your gardens, and water those vegetables that have been transplanted.

5. Gather and lay up all kinds of seeds when they are ripe.

6. Suffer not yourself, or any man or beast under your care, to drink cold liquor when you or they are hot, lest death ensue.

AUGUST.

1. REAP or cradle your oats, get in your barley, and pull your flax.

2. Gather seeds as they ripen, and herbs for distilling and drying.

3. Water your gardens in the evening, if the season is dry.

4. When

4. When the weather is cloudy, re-inoculate those trees, where the scions are dead, that were inoculated in the spring.

5. Make cyder when your apples are ripe, and mow your second crop of grass as soon as it is fit.

6. Cut trees, bushes, briars, and thistles, when the moon is in Leo, or the sign is in the heart; it is said, that it will kill their roots.

SEPTEMBER.

1. CUT the stalks of your Indian corn; bind them in bundles when they are dry, and put them into the barn.

2. Make cyder, pickle cucumbers, gather early apples.

3. Shut up your swine to fatten.

4. Destroy drone bees.

5. Dig potatoes, and rot your flax, but see that it is not rotted too much.

6. Sow winter rye and wheat in the new of the moon; gather your hops.

OCTOBER.

1. GATHER and husk your Indian corn.

2. Prune and plant fruit and forest-trees.

3. Clean out your ditches, drain off all stagnant waters, and destroy vegetable poisons, to prevent the generation of malignant distempers.

4. Make your winter cyder, and gather winter apples in the old of the moon.

5. Stop the growth of weeds in the garden.

6. Thresh out your garden-seeds, and put them in bags, and where they will not be hurt by the frost.

7. Prune

7. Prune and transplant fruit trees. The setting out of young orchards is too much neglected where people settle upon new lands. It has been said, that a young orchard will produce apples enough in seven years, if it is well pruned, for a family, both for cyder and other uses.

8. Gather chefnuts, walnuts, hazel-nuts, &c.

NOVEMBER.

1. BLEED your horses.
2. House your cattle, as the cold weather approaches.
3. Move your bees under a shelter, or into a warm place.
4. Continue to plant timber and fruit-trees.
5. Take up your beets, carrots, parsnips, turnips, cabbages, &c.
6. Secure your cellars against the frost, to prevent your potatoes, &c. from being destroyed by freezing.

DECEMBER.

1. TAKE good care of your cattle.
2. Thresh out your grain.
3. Break and swingle your flax.
4. Grind your tools, and keep them in good order for use.
5. Kill your hogs and fat cattle.
6. Take care of your geese, turkies, and fowls.
7. Feed your bees, if they havenot laid up honey enough to live upon.
8. In long evenings, read Theology, Geography, History, and the *American Oracle*, if you please.—Farewel! May *peace* and *prosperity* crown your labours! Amen.

London, April 25, 1791.

C H A P

CHAP. XLVII.

Of the Revolution of the American Colonies; Declaration of Independence.—Their Alliance with France.—Definitive Treaty of Peace with Great Britain.—Proclamation of Congress.—Treaty with Prussia.—Present Constitution, and Character of Gen. Washington.

HIS Excellency *Benjamin Franklin, Esq.* L. L. D. F. R. S. is said to be the prime conductor of the American Revolution; but be that as it may, it appears that the Foreign Powers were fearful that in process of time Great Britain would be too powerful, if her Colonies remained under her Government, and that from hence they aided and assisted in dismembering those Governments from the Mother Country.

I shall not attempt to give a long history of the war; but only observe, that on the 4th of July, 1776; thirteen colonies, viz. New Hampshire, the Massachusetts, Rhode-Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia, were declared independent of the English Crown, by a Congress of Delegates, convened

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vened at Philadelphia, who had been sent there by the Legislative Assemblies in the different Provinces. A terrible war ensued, not only between Great Britain and the Revolted Colonies; but between England, France, Spain, and Holland. It has been said, that the British lost upwards of 100,000 men, and that the National Debt was augmented more than 100 millions of pounds sterling, by the contest; slaughter and desolation overspread the land, in many parts of America; great numbers fell by the sword; many died of camp diseases, and many towns and villages were laid waste. How many of the Americans were lost by this war is unknown to me, but a clergyman, who was a travelling preacher, in the Southern Governments, whilst the war continued, and not a Loyalist, informed me, that the inhabitants of South Carolina were not so numerous by 100,000 when the war ended, as they were when it began; but it is thought, that the greatest part of them died with sickness. A British Major told me, that more than 50 died in a day, take one day with another, with illness, for a long time, at a place where he was stationed in that Government. This war involved the Americans in debt, to the amount of 65 millions of dollars, according to a late publication which I have seen, as was before observed. Gen. Washington was Commander in Chief of the American armies during the war, and conducted his military operations with such great skill, that at last a peace was established, whereby the Revolted Colonies

Colonies were not only declared independent by some Foreign Powers, but by Great Britain.

For the Benefit of my Readers, I shall conclude this chapter, by adding,

1. The Declaration of the American Independence.
2. The Alliance of the States with France.
3. Their Definitive Treaty of Peace with Great Britain.
4. A Proclamation of Congress.
5. Their Treaty with Prussia.
6. Their present Constitution, and
7. The character of General Washington.

I. IN CONGRESS, *July 4, 1776.*

A DECLARATION by the Representatives of the United States of America, in General Congress assembled.

WHEN, in the course of human events, it becomes necessary for a people to dissolve the political basis which have connected them with another, and to assume among the powers of the earth the separate and equal station, to which the laws of nature, and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident—that all men are created equal; that they are endowed by

their Creator with certain unalienable rights; that among these are life, liberty, and the pursuit of happiness. That to secure those rights governments are instituted among men, deriving their just powers from the consent of the governed; and whenever any form of government becomes destructive of these ends, it is the right of the people to alter and abolish it, and to institute a new government, laying its foundation on such principles, and organizing its powers in such form as to them shall seem most likely to effect their safety and happiness.—Prudence, indeed, will dictate that governments long established, should not be changed for light and transient causes, and accordingly all experience hath shewn, that mankind are more disposed to suffer, while evils are sufferable, than to right themselves, by abolishing the forms to which they are accustomed; but, when a long train of abuses and usurpations, pursuing invariably the same object, evinces the design to reduce them under absolute despotism, it is their right, it is their duty to throw off such government, and to provide new guards for their future security. Such has been the patient sufferance of these Colonies, and such is now the necessity which constrains them to alter their former systems of government. The history of the present ——— of ——— is a history of repeated injuries and usurpations, all having in direct object the establishment of an absolute tyranny over these states. To prove this, let facts be submitted to a candid world.

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He has refused his assent to laws the most wholesome and necessary for the public good.

He has forbidden his governors to pass laws of immediate and pressing importance, unless suspended in their operation till his assent should be obtained; and when so suspended, he has utterly neglected to attend to them.

He has refused to pass other laws for the accommodation of large districts of people, unless those people would relinquish the right of representation in the legislature, a right inestimable to them, and formidable to Tyrants only.

He has called together legislative bodies at places unusual, unconformable and distant from the depository of the public records, for the sole purpose of fatiguing them into compliance with his measures.

He has dissolved representative houses repeatedly, for opposing, with manly firmness, his invasions on the rights of the people.

He has refused a long time after such dissolution to cause others to be erected, whereby the legislative powers, incapable of annihilation, have returned to the people at large for their exercise, the state remaining, in the mean time, exposed to all the dangers of invasion from without, and convulsions within.

He has endeavoured to prevent the population of these states; for that purpose obstructing the laws for naturalization of foreigners, refusing to pass others to encourage their migration hither,

and raising the conditions of new appropriated lands.

He has obstructed the administration of justice, by refusing his assent to laws for establishing judiciary powers.

He has made judges dependent on his will alone for the tenure of their offices, and the amount and payment of their salaries.

He has erected a multitude of new offices, and sent hither swarms of officers to harass our people, and eat out their subsistence.

He has kept amongst us, in times of peace, standing armies, without the consent of our legislature.

He has affected to render the military independent of, and superior to the civil power.

He has combined with others to subject us to a jurisdiction foreign to our constitution, and unacknowledged by our laws, giving his assent to their pretended acts of legislation.

For quartering large bodies of armed troops amongst us.

For protecting them, by a mock trial, from punishment for any murders which they should commit on the inhabitants of these states.

For cutting off our trade with all parts of the world.

For imposing taxes on us without our consent.

For depriving us, in many cases, of the benefit of trial by jury.

For transporting us beyond seas to be tried for pretended offences.

For abolishing the free system of English laws in a neighbouring Province, establishing therein an arbitrary government, and enlarging its boundaries, so as to render it at once an example and a fit instrument for introducing the same absolute rule into these Colonies.

For taking away our charters, abolishing our most valuable laws, and altering fundamentally the forms of our governments.

For suspending our own legislatures, and declaring themselves invested with power to legislate for us in all cases whatsoever.

He has abdicated government here, by declaring us out of his protection, and waging war against us.

He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the lives of our people.

He is at this time transporting large armies of foreign mercenaries to complete the works of death, desolation, and tyranny, already begun with circumstances of cruelty and perfidy scarcely paralleled in the most barbarous ages, and totally unworthy the head of a civilized nation.

He has constrained our fellow citizens, taken captive on the high seas, to bear arms against their country, to become executioners of their friends and brethren, or to fall themselves by their hands.

He has excited domestic insurrections amongst us, and has endeavoured to bring on the inhabitants of our frontiers, the merciless Indian savages,

whose known rule of warfare is an undistinguished destruction of all ages, sexes, and conditions.

In every stage of these oppressions we have petitioned for redress in the most humble terms; our repeated petitions have been answered only by repeated injury. A prince whose character is thus marked by every act which may define a tyrant, is unfit to be the ruler of a free people.

Nor have we been wanting in attention to our British brethren; we have warned them, from time to time, of attempts by their legislature to extend an unwarrantable jurisdiction over us; we have reminded them of the circumstances of our emigration and settlement here; we have appealed to their native justice and magnanimity, and we have conjured them by the ties of our common kindred, to disavow these usurpations, which would inevitably interrupt our connections and correspondence. They too have been deaf to the voice of justice and consanguinity. We must therefore acquiesce in the necessity which denounces our separation, and hold them as we hold the rest of mankind, enemies in war, in peace friends.

We, therefore, the representatives of the United States of America, in General Congress assembled, appealing to the Supreme Justice of the world for the rectitude of our intentions, do, in the name of, and by the authority of the good people of these Colonies, solemnly publish, and declare, that these united Colonies are, and of right, ought to be, FREE and INDEPENDENT STATES, and that they

they are absolved from all allegiance to the British Crown, and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved; and that as free and independent States, they have full power to levy war, conclude peace, contract alliances, establish commerce, and to do all other acts and things, which Independent States may of right do. And for the support of this declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our lives, our fortunes, and our sacred honour.

(Signed by order, and in behalf of the Congress.)

JOHN HANCOCK, President.

(Attest)

CHARLES THOMSON, Sec.

II. ALLIANCE WITH FRANCE.

A Treaty of Amity and Commerce between his MOST CHRISTIAN MAJESTY and the UNITED STATES of AMERICA.

WHEREAS his Most Christian Majesty and the United States of North America, namely, New Hampshire,

Hampshire,

Hampshire, &c. &c. having this day concluded a Treaty of Amity and Commerce, for the mutual advantage of their subjects, think it necessary to take under their most serious consideration the means of establishing those engagements upon a solid basis, and rendering them subservient to the security and peace of both parties; especially in case Great Britain, in detestation of such good correspondence, which is the object of the said treaty, should break with France, either by direct hostilities, or by annoying its commerce and navigation, contrary to the rights of the nations, and to the good understanding subsisting between the two Crowns.

And whereas his Majesty and the United States have come to a resolution, in the aforesaid case, to unite their Councils, and direct their joint efforts against the undertakings of the common enemy; the respective Plenipotentiaries, authorized to agree upon such conditions most likely to answer their intentions, after the most mature deliberation stipulated and agreed upon the following articles:

Art. 1. In case war should break out between France and Great Britain, during the present contest between the latter and the United States, his Most Christian Majesty and the said States will join in one cause, and mutually assist each other with their respective good offices, councils, and forces, as circumstances may require, and as becomes good and faithful Allies.

Art. 2.

Art. 2. The direct and essential meaning of the present defensive alliance is effectually to maintain the freedom, sovereignty, absolute and unbounded independence of the United States both in matters of government and commerce.

Art. 3. The contracting Powers shall each on its part, and in such manner as may be deemed best, direct all their efforts against the common enemy, to the purpose of fulfilling the present engagement.

Art. 4. The contracting Powers covenant, that, in case either of them shall undertake any thing in which the concurrence of the other shall be deemed requisite, the latter shall directly, and *bona fide*, join the former, in order to act in concert, as far as circumstances and situations will permit; and, in such case, they shall by private convention regulate the number and kind of forces to be found, as well as the time and manner of acting, and the advantages which may be granted as a compensation.

Art. 5. If the United States shall think it convenient to attempt the reduction of the remaining Britannic possessions in the Northern parts of America, or in the Islands of Bermuda; such countries in case of success, shall be confederate with, or dependent on, the said States.

Art. 6. His Most Christian Majesty, for ever, gives up all thoughts of possessing himself of the Islands of Bermuda, or any part of the Continent in North-America, which, before the Treaty of

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Paris, 1763, or by virtue thereof, have been acknowledged as belonging to the Crown of Great Britain, or the United States, heretofore denominated British Colonies, or are at present, or hitherto have been, under the power of the King and Crown of Great Britain.

Art. 7. In case his Most Christian Majesty should attack any of the islands situate in or near the Gulf of Mexico, which are at present within the dominions of Great Britain, and should take the same, they shall belong to the Crown of France.

Art. 8. Neither of the contracting Powers shall be at liberty to conclude peace or truce with Great Britain, without the previous and formal consent of the other. And they do mutually engage not to lay down their arms before the independence of the United States shall have been formally or implicitly secured by the treaty or treaties, which shall terminate the war.

Art. 9. The contracting parties do declare, that, being resolved, each on its part, to fulfil the articles and conditions of the present Treaty of Alliance, according to their power and circumstances, there will be no manner of compensation reserved, neither on one part nor the other, whatever may be the issue of the war.

Art. 10. His Most Christian Majesty and the United States do agree to invite or admit any other Power as may have experienced any wrongs from England to join with them, and accede to
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the present alliance, under such conditions as may freely be agreed upon and regulated between all parties.

Art. 11. The two contracting parties guaranty each other, from this instant, and for ever, against all other Powers, viz. The United States to his Most Christian Majesty all the American possessions now belonging to the Court of France, as well as those that may be made over to it by a future treaty of peace; and his Most Christian Majesty guaranties on his part to the United States their freedom, sovereignty, and absolute independence both in matters of government and commerce, as also their possessions and the increase or conquests, as may arise from their confederation during the war, over any of the domains now, or heretofore the property of Great Britain, in North-America, agreeable to the foregoing 5th and 6th Articles; so that the possession shall be fixed and secured to the said States at the conclusion of their present war with England.

Art. 12. That the meaning of the foregoing Articles may be more precisely understood, the contracting parties do declare, that, in case of a rupture between France and England, the guaranty aforesaid shall be in full force, from the instant the war shall be declared; if the case should be otherwise, the mutual obligations of the said guaranty shall only take place from the time that a cessation of hostilities between England and the said States shall have ascertained the latter.

Art. 13.

Art. 12. The present Treaty shall be ratified on both sides, and the ratification interchanged within the space of six months, or sooner if possible.

In witness whereof the respective Plenipotentiaries, viz. on the part of his Most Christian Majesty, the Sieur Conrad Alexandre Gerard, &c. &c. On the part of the States, the Sieur Benjamin Franklin, Deputy to Congress from Pennsylvania, and President of the Convention to the said States, Silas Deane, &c. and Arthur Lee, LL. D. who have hereunto set their hands and seals; declaring meanwhile, that the present Treaty was composed and concluded in the French language.

Done at Paris, Feb. 6, 1778.

(L. S.) C. A. GERARD.

(L. S.) BENJ. FRANKLIN.

(L. S.) SILAS DEANE.

(L. S.) ARTHUR LEE.

III. *The* DEFINITIVE TREATY *between*
 GREAT-BRITAIN *and the* UNITED STATES OF
 AMERICA. *Signed at Paris, the 3d Day of Sep-*
tember, 1783.

In the Name of the Most Holy and Undivided
 Trinity.

IT having pleased the Divine Providence to dispose the hearts of the Most Serene and Most Potent Prince George the Third, by the Grace of God King of Great Britain, France, and Ireland, Defender of the Faith, Duke of Brunswick and Lunenburgh, Arch-Treasurer and Prince Elector of the Holy Roman Empire, &c. and of the United States of America, to forget all past misunderstandings and differences that have unhappily interrupted the good correspondence and friendship which they mutually wish to restore, and to establish such a beneficial and satisfactory intercourse between the two countries, upon the ground of reciprocal advantages and mutual convenience, as may promote and secure to both perpetual peace and harmony; and having for this desirable end already laid the foundation of peace and reconciliation, by the Provisional Articles signed at Paris on the 30th of November, 1782, by the Commissioners empowered on each part, which Articles were agreed to be inserted
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in, and to constitute the Treaty of Peace proposed to be concluded between the Crown of Great Britain and the said United States, but which Treaty was not to be concluded until terms of Peace should be agreed upon between Great Britain and France, and his Britannic Majesty should be ready to conclude such Treaty accordingly; and the Treaty between Great Britain and France, having since been concluded, his Britannic Majesty and the United States of America, in order to carry into full effect the Provisional Articles above-mentioned, according to the tenor thereof, have constituted and appointed, that is to say, his Britannic Majesty on his part, David Hartley, Esq. Member of the Parliament of Great Britain, and the said United States on their part, John Adams, Esq. late a Commissioner of the United States of America at the Court of Versailles, late Delegate in Congress from the State of Massachusetts, and Chief Justice of the said State, and Minister Plenipotentiary of the said United States to their High Mightinesses the States-General of the United Netherlands; Benjamin Franklin, Esq. late Delegate in Congress from the State of Pennsylvania, President of the Convention of the said State, and Minister Plenipotentiary from the United States of America at the Court of Versailles; and John Jay, Esq. late President of Congress, and Chief Justice of the State of New-York, and Minister Plenipotentiary from the said United States at the Court of Madrid,

drid, to be the Plenipotentiaries for the concluding and signing the present Definitive Treaty; who, after having reciprocally communicated their respective full powers, have agreed upon and confirmed the following Articles:

ART. I. His Britannic Majesty acknowledges the said United States, viz. New-Hampshire, Massachusetts-Bay, Rhode-Island and Providence Plantations, Connecticut, New-York, New-Jersey, Pennsylvania, Delaware, Maryland, Virginia, North-Carolina, South-Carolina, and Georgia, to be free, sovereign, and independent States; that he treats with them as such, and for himself, his heirs, and successors, relinquishes all claims to the government, propriety, and territorial rights of the same, and every part thereof.

ART. II. And that all disputes which might arise in future on the subject of the boundaries of the said United States may be prevented, it is hereby agreed and declared, that the following are and shall be their boundaries, viz. From the north-west angle of Nova-Scotia, viz. That angle which is formed by a line drawn due north from the source of St. Croix River to the Highlands, along the said Highlands, which divide those rivers that empty themselves into the river St. Lawrence, from those which fall into the Atlantic Ocean to the North-westernmost head of Connecticut-river; thence down along the middle of that river to the forty-fifth degree of north-latitude; from thence by a line due west on said latitude,

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until it strikes the river Irriquois or Caatraquy ; thence along the middle of the said river into Lake Ontario ; through the middle of said lake, until it strikes the communication by water between that lake and Lake Erie ; thence along the middle of said communication into Lake Erie, through the middle of said lake, until it arrives at the water communication between that lake and Lake Huron ; thence through the middle of said lake to the water communication between that lake and Lake Superior ; thence through Lake Superior northward of the Isles Royal and Phelipeaux to the Long Lake ; thence through the middle of said Long Lake and the water communication between it and the Lake of the Woods, to the said Lake of the Woods ; thence through the said lake to the most north-western point thereof, and from thence on a due west course to the River Mississippi ; thence by a line to be drawn along the middle of the said River Mississippi ; until it shall intersect the northernmost part of the thirty-first degree of north latitude. South, by a line to be drawn due east from the determination of the line last-mentioned in the latitude of thirty-one degrees north of the equator, to the middle of the River Apalachicola or Catahouche ; thence along the middle thereof to its junction with the Flint-river ; thence strait to the head of St. Mary's River ; and thence down along the middle of St. Mary's River to the Atlantic Ocean ; east, by a line to be drawn along the middle of the River
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St. Croix from its mouth in the Bay of Fundy to its source, and from its source directly north to the aforesaid Highlands, which divide the rivers that fall into the Atlantic Ocean from those which fall into the River St. Lawrence, comprehending all Islands within twenty leagues of any part of the shores of the United States, and lying between lines to be drawn due east from the points where the aforesaid boundaries between Nova-Scotia on the one part, and East-Florida on the other, shall respectively touch the Bay of Fundy and the Atlantic Ocean, excepting such Islands as now are or heretofore have been within the limits of the said province of Nova Scotia.

ART. III. It is agreed that the people of the United States shall continue to enjoy unmolested the right to take fish of every kind on the Grand Bank, and on all the other Banks of Newfoundland, also in the Gulph of St. Lawrence, and all other places in the sea, where the inhabitants of both countries used at any time heretofore to fish. And also that the inhabitants of the United States shall have liberty to take fish of every kind on such part of the coast of Newfoundland as British fishermen shall use, (but not to dry or cure the same on that Island) and also on the coasts, bays and creeks of all of his Britannic Majesty's dominions in America; and that the American fishermen shall have liberty to dry and cure fish in any of the unsettled bays, harbours and creeks of Nova-Scotia, Magdalen Islands and Labrador, so

long as the same shall remain unfettled; but fo soon as the same or either of them shall be fettled, it shall not be lawful for the faid fishermen to dry or cure fish at fuch fettlement, without a previous agreement for that purpose with the inhabitants, proprietors or poffeffors of the ground.

ART. IV. It is agreed that the creditors on either fide shall meet with no lawful impediment to the recovery of the full value, in fterling money, of all *bona fide* debts heretofore contracted.

ART. V. It is agreed that Congress shall earnestly recommend to the Legislatures of the refpective States, to provide for the reftitution of all eftates, rights, and properties, which have been confiscated, belonging to real British fubjects; and alfo of the eftates, rights, and properties of perfons refident in diftricts in the poffeffion of his Majefty's arms, and who have not borne arms againft the faid United States; and that perfons of any other difcription shall have free liberty to go to any part or parts of any of the Thirteen United States, and therein to remain twelve months unmolefted in their endeavours to obtain the reftitution of fuch of their eftates, rights, and properties, as may have been confiscated; and that Congress shall alfo earnestly recommend to the feveral States a re-consideration and revision of all Acts or Laws regarding the premises, fo as to render the faid Laws or Acts perfectly confiftent not only with juftice and equity, but with that fpirit of conciliation, which, on the return of the bleffings of
peace,

peace, should univerfally prevail; and that Congreffes fhall alfo earneftly recommend to the feveral States, that the eftates, rights, and properties of fuch laft-mentioned perfons fhall be reftored to them, they refunding to any perfons who may be now in poffeffion the *bona fide* price (where any has been given) which fuch perfons may have paid on purchafing any of the faid lands, rights, or properties fince the confifcation.

And it is agreed, that all perfons who have any intereft in confifcated lands, either by debts, marriage fettlements, or otherwife, fhall meet with no lawful impediment in the profecution of their juft rights.

ART. VI. That there fhall be no future confifcations made, nor any profecutions commenced againft any perfon or perfons for, or by reafon of the part which he or they may have taken in the prefent war; and that no perfon fhall, on that account, fuffer any future lofs or damage, either in his perfon, liberty, or property; and that thofe who may be in confinement on fuch charges, at the time of the ratification of the Treaty in America, fhall be immediately fet at liberty, and the profecutions fo commenced be difcontinued.

ART. VII. There fhall be a firm and perpetual peace between his Britannic Majefty and the faid States, and between the fubjects of the one, and the citizens of the other; wherefore all hoftilities both by fea and land fhall, from henceforth, ceafe; all prifoners on both fides fhall be fet at

liberty, and his Britannic Majesty shall, with all convenient speed, and without causing any destruction, or carrying away any negroes, or other property of the American inhabitants, withdraw all his armies, garrisons, and fleets from the said United States, and from every post, place, and harbour within the same, leaving in all fortifications the American artillery that may be therein; and shall also order and cause all archives, records, deeds, and papers belonging to any of the said States, or their citizens, which in the course of the war may have fallen into the hands of his officers, to be forthwith restored, and delivered to the proper States and persons to whom they belong.

ART. VIII. The navigation of the River Mississippi, from its source to the ocean, shall for ever remain free and open to the subjects of Great Britain, and the citizens of the United States.

ART. IX. In case it should so happen that any place or territory belonging to Great Britain, or to the United States, should have been conquered by the arms of either from the other, before the arrival of the said Provisional Articles in America, it is agreed that the same shall be restored without difficulty, and without requiring any compensation.

ART. X. The solemn ratifications of the present Treaty, expedited in good and due form, shall be exchanged between the the Contracting Parties in the space of six months, or sooner, if possible,

possible, to be computed from the day of the signature of the present Treaty. In witness whereof we the undersigned, their Ministers Plenipotentiary, have in their name, and in virtue of our full powers, signed with our hands the present Definitive Treaty, and caused the Seals of our Arms to be affixed thereto.

Done at Paris, this 3d day of September, in the year of our Lord one thousand seven hundred and eighty-three.

	(L. S.)	JOHN ADAMS.
(L. S.)	DAVID HARTLEY.	
	(L. S.)	B. FRANKLIN.
	(L. S.)	JOHN JAY.

GEORGE R.

George the Third, by the Grace of God, King of Great Britain, France and Ireland, Defender of the Faith, Duke of Brunswick and Lunenburgh, Arch-Treasurer and Prince Elector of the Holy Roman Empire, &c. To all to whom these Presents shall come, Greeting :

Whereas, for the perfecting and establishing the peace, friendship, and good understanding, so happily commenced by the Provisional Articles signed at Paris the thirtieth day of November last, by the Commissioners of us and our good friends the United States of America, viz. New-Hampshire, Massachusetts-Bay, Rhode-Island, Connecticut, New-York, New-Jersey, Pennsylvania, the three Lower Counties on Delaware, Maryland,

Virginia, North-Carolina, South-Carolina and Georgia, in North-America, and for opening, promoting and rendering perpetual the mutual intercourse of trade and commerce between our kingdoms and the dominions of the said United States, we have thought proper to invest some fit person with full powers on our part to meet and confer with the Ministers of the said United States, now residing at Paris, duly authorized for the accomplishing of such laudable and salutary purposes. Now know ye that we, reposing special trust and confidence in the wisdom, loyalty, diligence, and circumspection of our trusty and well-beloved David Hartley, Esq. (on whom we have therefore conferred the rank of our Minister Plenipotentiary) have nominated, constituted, and appointed, and by these presents do nominate, constitute and appoint him our true, certain, and undoubted Commissioner, Procurator, and Plenipotentiary, giving and granting to him all and all manner of faculty, power, and authority, together with general as well as special order (so as the general do not derogate from the special, nor on the contrary) for us and in our name, to meet, confer, treat and conclude with the Minister or Ministers furnished with sufficient powers on the part of our said good friends the United States of America, of and concerning all such matters and things as may be requisite and necessary for accomplishing and completing the several ends and purposes herein before-mentioned; and also for

us and in our name to sign such Treaty or Treaties, Convention or Conventions, or other instruments whatsoever, as may be agreed upon in the premises; and mutually to deliver and receive the same in exchange, and to do and perform all such other acts, matters, and things as may be any ways proper and conducive to the purposes above-mentioned, in as full and ample form and manner, and with the like validity and effect, as we ourself, if we were present, could do and perform the same; engaging and promising on our Royal word, that we will accept, ratify, and confirm, in the most effectual manner, all such acts, matters, and things, as shall be so transacted and concluded by our aforesaid Commissioner, Procurator, and Plenipotentiary, and that we will never suffer any person to violate the same in the whole or in part, or to act contrary thereto. In testimony and confirmation of all which, we have caused our Great Seal of Great Britain to be affixed to these presents, signed with our Royal hand.

Given at our Palace at St. James's, the fourteenth day of May, in the year of our Lord one thousand seven hundred and eighty-three, and in the twenty-third year of our reign.

I David Hartley, the Minister above-named, certify the foregoing to be a true Copy from my original Commission, delivered to the American Ministers this 19th day of May, 1783.

(Signed)

DAVID HARTLEY.

The

The UNITED STATES of AMERICA in CONGRESS
assembled,

To all to whom these Presents shall come, send
Greeting.

WHEREAS these United States, from a sincere desire of putting an end to the hostilities between his Most Christian Majesty and these United States on the one part, and his Britannic Majesty on the other and of terminating the same by a peace founded on such solid and equitable principles as reasonably to promise a permanency of the blessings of tranquillity, did heretofore appoint the Hon. John Adams, late a Commissioner of the United States of America at the Court of Versailles, late Delegate in Congress from the State of Massachusetts, and Chief Justice of the said State, their Minister Plenipotentiary, with full powers general and special to act in that quality, to confer, treat, agree, and conclude with the Ambassadors or Plenipotentiaries of his Most Christian Majesty, and of his Britannic Majesty, and those of any other Princes or States whom it might concern, relating to the re-establishment of peace and friendship; and whereas the flames of war have since that time been extended, and other Nations and States are involved therein: Now know ye, that we still continuing earnestly desirous, as far as depends upon us, to put a stop to the effusion of blood, and to convince the Powers

of

of Europe, that we wish for nothing more ardently than to terminate the war by a safe and honourable peace, have thought proper to renew the powers formerly given to the said John Adams, and to join four other persons in commission with him; and having full confidence in the integrity, prudence, and ability of the Honourable Benjamin Franklin, our Minister Plenipotentiary at the Court of Versailles, and the Honourable John Jay, late President of Congress and Chief-Justice of the State of New-York, and our Minister Plenipotentiary at the Court of Madrid, and the Hon. Henry Laurens, formerly President of Congress, and commissioned and sent as our Agent to the United Provinces of the Low Countries, and the Hon. Thomas Jefferson, Governor of the Commonwealth of Virginia, have nominated, constituted, and appointed, and by these presents do nominate, constitute, and appoint the said Benjamin Franklin, John Jay, Henry Laurens, and Thomas Jefferson, in addition to the said John Adams, giving and granting to them, the said John Adams, Benjamin Franklin, John Jay, Henry Laurens, and Thomas Jefferson, or the majority of them, or of such of them as may assemble, or, in case of the death, absence, indisposition, or other impediment of the others, to any one of them, full power and authority, general and special, conjunctly and separately, and special command to repair to such place as may be fixed upon for opening negotiations for peace, and there, for

and in our name, to confer, treat, agree, and conclude with our Ambassadors, Commissioners Plenipotentiaries of the Princes and States whom it may concern, vested with equal powers relating to the establishment of Peace; and whatsoever shall be agreed and concluded for us and in our name to sign; and thereupon make a Treaty or Treaties and to transact every thing that may be necessary for compleating, securing, and strengthening the great work of pacification, in as ample form, and with the same effect, as if we were personally present and acted therein, hereby promising in good faith that we will accept, ratify, fulfil, and execute whatever shall be agreed, concluded, and signed by our said Ministers Plenipotentiary, or a majority of them, or of such of them as may assemble, or in case of the death, absence, indisposition, or other impediment of the others, by any one of them; and that we will never act nor suffer any person to act contrary to the same in whole or in any part. In witness whereof we have caused these presents to be signed by our President, and sealed with his Seal.

Done at Philadelphia, the fifteenth day of June, in the year of our Lord one thousand seven hundred and eighty-one, and in the fifth year of our Independence. By the United States in Congress assembled.

(Signed)

SAM. HUNTINGTON, President.
CHARLES THOMSON, Sec.

We

We certify the foregoing copies of the respective full powers to be authentic. Paris, Sept. 3, 1783.

(Signed) GEORGE HAMMOND Secretary to the British Commission.

W. T. FRANKLIN, Secretary to the American Commission.

RATIFICATION of PEACE by the AMERICAN CONGRESS.

By the UNITED STATES, in CONGRESS assembled.

A PROCLAMATION.

WHEREAS definitive articles of peace and friendship, between the United States of America and his Britannic Majesty, were concluded and signed at Paris, on the 3d day of September, 1783, by the Plenipotentiaries of the said United States and of his Britannic Majesty, duly and respectively authorized for that purpose; which definitive articles are in the words following:

And we the United States in Congress assembled, having seen and duly considered the definitive articles aforesaid, did by a certain act under the seal of the United States, bearing date this 14th

day

day of Jan. 1784, approve, ratify and confirm the same, and every part and clause thereof, engaging and promising that we would sincerely and faithfully perform and observe the same, and never suffer them to be violated by any one, or transgressed in any manner as far as should be in our power; and being sincerely disposed to carry the said articles into execution truly, honestly, and with good faith, according to the intent and meaning thereof, we have thought proper by these presents, to notify the premises to all good citizens of the United States, hereby requiring and enjoining all bodies of magistracy, legislative, executive and judiciary, all persons bearing office, civil or military, of whatsoever rank, degree, powers, and all others the good citizens of these States of every vocation and condition, that the reverencing those stipulations entered into on their behalf, under the authority of the federal bond by which their existence as an independent people is bound up together, and is known and acknowledged by the nations of the world, and with that good faith which is every man's surest guide within their several offices, jurisdictions, and vocations, they carry into effect the said definitive articles, and every clause and sentiment thereof, sincerely, strictly and completely.

Given under the Seal of the United States. Witness his Excellency THOMAS MIFFLIN, President, at Annapolis, this 14th day of January, in the year of our Lord one thousand

seven hundred and eighty-four, and of the sovereignty and independence of the United States of America the eighth.

CHARLES THOMSON, Sec.

A TREATY of AMITY and COMMERCE between his Majesty the King of PRUSSIA, and the United States of AMERICA.

HIS Majesty the King of Prussia, and the United States of America, desiring to fix in a permanent and equitable manner, the rules to be observed in the intercourse and commerce they desire to establish between their respective countries, have judged, that the said end cannot be better obtained than by taking the most perfect equality and reciprocity for the basis of their agreement.

With this view, his Majesty the King of Prussia has nominated and constituted, as his Plenipotentiary, the Baron Frederic William de Thulemeyer, Envoy Extraordinary with their High Mightinesses the States General of the United Netherlands; and the United States have, on their part, given full powers to John Adams, Esq. now Minister Plenipotentiary of the United States with his Britannic Majesty: Dr. Benjamin Franklin, and Thomas Jefferson, respective Plenipotentiaries

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ries, have concluded articles, of which the following is an abstract, so far as concerns the States of America.

The subjects of his Majesty the King of Prussia may frequent all the coasts and countries of the United States of America, and reside and trade there in all sorts of produce, manufactures, and merchandize, and shall pay within the said United States no other or greater duties, charges, or fees whatsoever, than the most favoured nations are or shall be obliged to pay; and they shall enjoy all the rights, privileges, and exemptions, in navigation and commerce, which the most favoured nation does or shall enjoy; submitting themselves to the laws and usages there established.

In like manner, the citizens of the United States of America may frequent all the coasts and countries of his Majesty the King of Prussia, and reside and trade there in all sorts of produce, manufactures, and merchandize, and shall pay in the dominions of his said Majesty, no other greater duties, charges, or fees whatsoever, than the most favoured nation is or shall be obliged to pay; and they shall enjoy all the rights, privileges and exemptions, in navigation and commerce, which the most favoured nation does or shall enjoy; submitting themselves as aforesaid.

Each party shall have a right to carry their own produce, manufactures and merchandize, in their own or any other vessels, to any parts of the dominions

minions of the other, where it shall be lawful for all the subjects or citizens of that other freely to purchase them; and thence to take the produce, manufactures and merchandize of the other, which all the said citizens or subjects shall in like manner be free to sell them, paying in both cases such duties, charges, and fees only, as are or shall be paid by the most favoured nation.

Each party shall endeavour to protect and defend all vessels, and other effects, belonging to the citizens or subjects of the other, which shall be within the extent of their jurisdiction by sea or land; and shall use all their efforts to recover, and cause to be restored to their right owners, their vessels and effects which shall be taken from them within the extent of their said jurisdiction.

If one of the contracting parties should be engaged in war with other powers, the free intercourse and commerce of the subjects or citizens of the party remaining neuter with the belligerent powers, shall not be interrupted. On the contrary, in that case; as in full peace; the vessels of the neutral party may navigate freely to and from the ports, and on the coasts of the belligerent parties, free vessels making free goods, insomuch, that all things shall be adjudged free which shall be on board any vessel belonging to the neutral party, although such things belong to an enemy of the other; and the same freedom shall be extend-

ed to persons who shall be on board a free vessel, although they should be enemies to the other party, unless they be soldiers in actual service of such enemy.

In the same case of one of the contracting parties being engaged in war with any other power—to prevent all the difficulties and misunderstandings which usually arise respecting the merchandise heretofore called contraband, such as arms, ammunition and military stores of every kind—no such articles carried in the vessels, or by the subjects or citizens of one of the parties to the enemies of the other, shall be deemed contraband, so as to induce confiscation or condemnation, and a loss of property to individuals. But in the case supposed—of a vessel stopped for the articles heretofore deemed contraband, if the master of the vessel stopped will deliver out the goods supposed to be of contraband nature, he shall be admitted to do it, and the vessel shall not in that case be carried into any port, nor further detained, but shall be allowed to proceed on her voyage.

If the contracting parties shall be engaged in war against a common enemy, the following points shall be observed between them.

1st, If a vessel of one of the parties, re-taken by a privateer of the other, shall not have been in possession of the enemy more than 24 hours, she shall be restored to the first owner for one third of the value of the vessel and cargo; but if she shall

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have been more than 24 hours in possession of the enemy, she shall belong wholly to the re-captor. 2d, If in the same case the re-capture were by a public vessel of war of the one party, restitution shall be made to the owner of one thirtieth part of the vessel and cargo, if she shall not have been in the possession of the enemy more than 24 hours; and one tenth of the said value where she shall have been longer; which sums shall be distributed in gratuities to the re-captors. 3d, The restitution in the cases aforesaid shall be after due proof of property, and surety given for the part to which the re-captors are entitled. 4th, The vessels of war, public and private, of the two parties, shall be reciprocally admitted with their prizes into the respective ports of each; but the said prizes shall not be discharged nor sold there, until their legality shall have been decided according to the laws and regulations of the state to which the captors belong, but by the judicators of the place into which the prize shall have been conducted. 5th, It shall be free to each party to make such regulations as they shall judge necessary for the conduct of the respective vessels of war, public or private, relative to the vessels which they shall take and carry into the ports of the two parties.

Where the parties shall have a common enemy, or shall both be neutral, the vessels of war of each shall upon all occasions take under

their protection the vessels of the other going the same course, and shall defend such vessels as long as they hold the same course, against all force and violence, in the same manner as they ought to protect and defend vessels belonging to the party of which they are.

If war should arise between the two contracting parties, the merchants of either country, then residing in the other, shall be allowed to remain nine months to collect their debts and settle their affairs, and may depart freely, carrying off all their effects, without molestation or hinderance.

This treaty shall be in force during the term of ten years from the exchange of ratification

(Signed)

F. G. de THULEMEYER, *à la Haye, le 10
Septembre 1785.*

THO. JEFFERSON, *Paris, July 28, 1785,*

B. FRANKLIN, *Passy, July, 9, 1785.*

JOHN ADAMS, *London, Aug. 5, 1785.*

NOW KNOW YE, That we the said United States in Congress assembled, having considered and approved do hereby ratify and confirm the said Treaty. Witness the Hon. Nathaniel Gotham, our Chairman, in the absence of his Excellency John Hancock, our President, the 7th day of May, in the year of our Lord 1786, and of our Independence and Sovereignty the tenth.

The new Plan of the Constitution of the UNITED STATES of AMERICA, upon which the Convention of all the most distinguished Men in the States have been deliberating for several Months.

New-York, Sept. 21.

In Convention, Sept. 17, 1787.

SIR,

WE have now the honour to submit to the consideration of the United States, in Congress assembled, that Constitution which has appeared to us the most adviseable.

The friends of our country have long seen and desired, that the power of making war, peace, and treaties, that of levying money, and regulating commerce, and the correspondent executive and judicial authorities, should be fully and effectually vested in the general government of the Union: but the impropriety of delegating such extensive trust to one body of men is evident. Hence results the necessity of a different organization.

It is obviously impracticable, in the federal government of these States, to secure all rights of independent sovereignty to each, and yet provide for the interest and safety of all. Individuals, entering into a society, must give up a share of liberty to preserve the rest. The magnitude of the sacrifice must depend as well on situation and circumstance, as on the object to be obtained. It is

at all times difficult to draw with precision the line between those rights which must be surrendered, and those which may be reserved; and, on the present occasion, this difficulty was increased by a difference among the several States, as to their situation, extent, habits, and particular interests.

In all our deliberations on this subject, we kept steadily in our view, that which appears to us the greatest interest of every true American—the consolidation of our Union, in which is involved our prosperity, felicity, safety, perhaps our national existence. This important consideration, seriously and deeply impressed on our minds, led each State in the Convention to be less rigid on points of inferior magnitude than might have been otherwise expected; and thus the Constitution, which we now present, is the result of a spirit of amity, and that mutual deference and concession which the peculiarity of our political situation rendered indispensable.

That it will meet the full and entire approbation of every State is not perhaps to be expected; but each will doubtless consider, that had her interests been alone consulted the consequences might have been particularly disagreeable or injurious to others; that it is liable to as few exceptions as could reasonably have been expected, we hope and believe; that it may promote the lasting welfare of that country so dear to us all, and secure her freedom and happiness, is our most ardent wish.

With

With great respect, we have the honour to be,
 Sir, your Excellency's most obedient and humble
 servants,

GEORGE WASHINGTON, President.

By unanimous order of the Convention.

His Excellency the President of Congress.

WE, the people of the United States, in order
 to form a more perfect union, establish justice,
 insure domestic tranquility, provide for the com-
 mon defence, promote the general welfare, and
 secure the blessings of liberty to ourselves and our
 posterity, do ordain and establish this constitution
 for the United States of America.

ARTICLE I.

1. All legislative powers herein granted shall
 be vested in a Congress of the United States, which
 shall consist of a Senate and House of Represen-
 tatives.

2. The House of Representatives shall be
 composed of Members chosen every second year
 by the people of the several States, and the electors
 in each State shall have the qualifications requi-
 site of electors of the most numerous branch of the
 State Legislature.

No person shall be a Representative, who shall
 not have attained to the age of 25 years, and been
 seven years a citizen of the United States, and
 who shall not when elected be an inhabitant of that
 State in which he shall be chosen.

Representatives and direct taxes shall be apportioned among the several States which may be included within this union, according to their respective numbers, which shall be determined by adding to the whole number of free persons, including those bound to service for a term of years, and excluding Indians not taxed, three-fifths of all other persons. The actual enumeration shall be made within three years after the first meeting of the Congress of the United States, and within every subsequent term of ten years, in such manner as they shall by law direct. The number of Representatives shall not exceed one for every thirty thousand; but each State shall have at least one Representative; and until such enumeration shall be made, the State of New Hampshire shall be entitled to chuse three, Massachusetts eight, Rhode Island and Providence Plantations one, Connecticut five, New York six, New Jersey four, Pennsylvania eight, Delaware one, Maryland six, Virginia ten, North Carolina five, South Carolina five, and Georgia three.

When vacancies happen to the Representation from any State, the executive authority thereof shall issue writs of election to fill such vacancies.

The House of Representatives shall chuse their Speaker and other officers; and shall have the sole power of impeachment,

3. The

3. The Senate of the United States shall be composed of two Senators from each State, chosen by the Legislature thereof for six years; and each Senator shall have one vote.

Immediately after they shall be assembled in consequence of the first election, they shall be divided, as nearly as may be, into three classes. The seats of the Senators of the first class shall be vacated at the expiration of the second year; of the second class at the expiration of the fourth year; and of the third class at the expiration of the sixth year, so that one-third may be chosen every second year; and if vacancies happen by resignation, or otherwise, during the recess of the Legislature of any State, the executive authority thereof may make temporary appointments until the next meeting of the Legislature which shall then fill such vacancies.

No person shall be a Senator who shall not have attained to the age of 30 years, and been nine years a citizen of the United States, and who shall not, when elected, be an inhabitant of that State for which he shall be chosen.

The Vice President of the United States shall be President of the Senate, but shall have no vote unless they be equally divided.

The Senate shall choose their other officers, and also a President *pro tempore*, in the absence of the Vice President, or when he shall exercise the office of President of the United States.

The

The Senate shall have the sole power to try all impeachments. When sitting for that purpose, they shall be on oath or affirmation. When the President of the United States is tried, the Chief Justice shall preside; and no person shall be convicted without the concurrence of two-thirds of the Members present.

Judgment in cases of impeachment shall not extend farther than removal from office, and disqualification to hold and enjoy any office of honour, trust or profit, under the United States; but the party convicted shall nevertheless be liable and subject to indictment, trial, judgment, and punishment according to law.

4. The times, places, and manner of holding elections for Senators and Representatives, shall be prescribed in each State by the Legislature thereof; but the Congress may at any time by law make or alter such regulations, except as to the places of choosing Senators.

The Congress shall assemble at least once in every year, and such meeting shall be on the first Monday in December, unless they shall by law appoint a different day.

4. Each House shall be the judge of the elections, returns, and qualifications of its own Members, and a majority of each shall constitute a quorum to do business; but a smaller number may adjourn from day to day, and may be authorized to compel the attendance of absent Members, in such manner,

manner, and under such penalties, as each house may provide.

Each House may determine the rules of its proceedings, punish its Members for disorderly behaviour, and, with the concurrence of two-thirds, expel a Member.

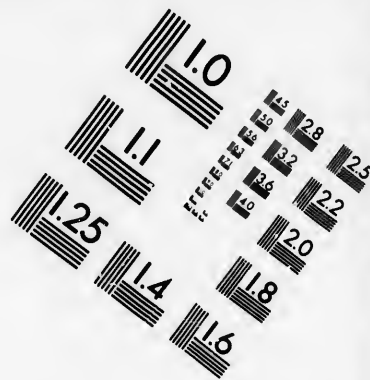
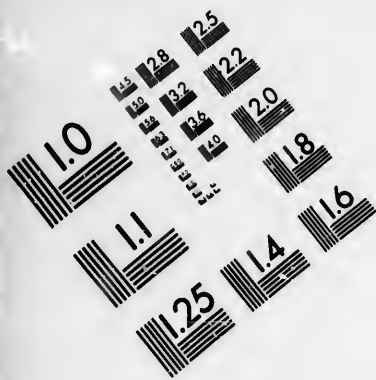
Each House shall keep a journal of its proceedings, and from time to time publish the same, excepting such parts as may in their judgment require secrecy; and the yeas and nays of the Members of either House on any question shall, at the desire of one-fifth of those present, be entered on the journal.

Neither House, during the session of Congress, shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two Houses shall be sitting.

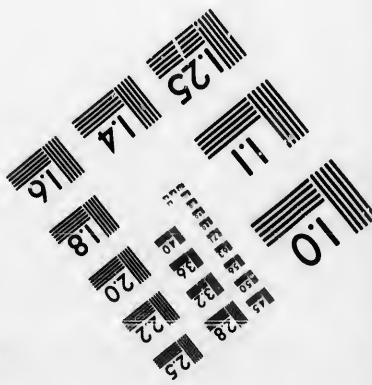
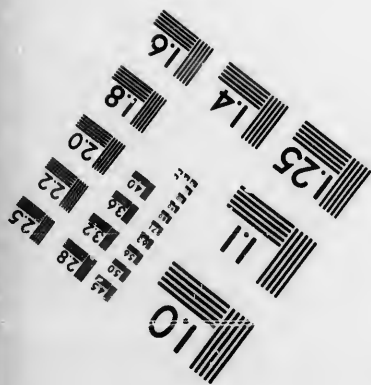
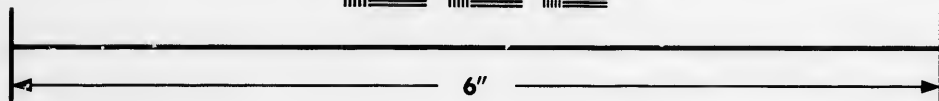
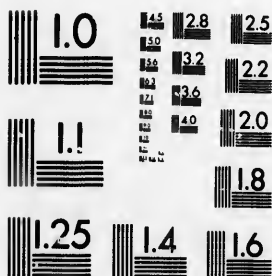
6. The Senators and Representatives shall receive a compensation for their services, to be ascertained by law, and paid out of the Treasury of the United States. They shall in all cases, except treason, felony, and breach of the peace, be privileged from arrest during their attendance at the session of their respective Houses, and in going to and returning from the same; and for any speech or debate in either House, they shall not be questioned in any other place.

No Senator or Representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United State,





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States, which shall have been created, or the emolument whereof shall have been increased, during such time, and no person holding any office under the United States shall be a Member of either House during his continuance in office.

7. All bills for raising revenue shall originate in the House of Representatives; but the Senate may propose or concur with amendments as on other bills.

Every bill, which shall have passed the House of Representatives and the Senate, shall, before it become a law, be presented to the President of the United States; if he approve, he shall sign it, but if not, he shall return it with his objections to that House in which it shall have originated, who shall enter the objections at large on their journal, and proceed to reconsider it. If, after such reconsideration, two-thirds of that House shall agree to pass the bill, it shall be sent, together with the objections, to the other House, by which it shall likewise be re-considered, and if approved by two-thirds of that House, it shall become a law. But in all such cases the votes of both Houses shall be determined by yeas and nays, and the names of the persons voting for and against the bill shall be entered on the journal of each House respectively. If any bill shall not be returned by the President within ten days (Sundays excepted) after it shall have been presented to him, the same shall be a law, in like manner as if

if he had signed it, unless the Congress by their adjournment prevent its return, in which case it shall not be a law.

Every order, resolution, or vote, to which the concurrence of the Senate and House of Representatives may be necessary (except on a question of adjournment) shall be presented to the President of the United States; and, before the same shall take effect, shall be approved by him, or, being disapproved by him, shall be repassed by two-thirds of the Senate and House of Representatives, according to the rules and limitations prescribed in the case of a bill.

8. The Congress shall have power to lay and collect taxes, duties, imposts and excises, to pay the debts and provide for the common defence and general welfare of the United States; but all duties, imposts, and excises, shall be uniform throughout the United States.

To borrow money on the credit of the United States.

To regulate commerce with foreign nations, and among the several States, and with the Indian tribes.

To establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies throughout the United States.

To coin money, regulate the value thereof and of foreign coin, and fix the standards of weights and measures.

To

To provide for the punishment of counterfeiting the securities and current coin of the United States.

To establish post-offices and post-roads.

To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.

To constitute tribunals inferior to the Supreme Court.

To define and punish piracies and felonies committed on the high seas, and offences against the law of nations.

To declare war, grant letters of marque and reprisal, and make rules concerning captures on land and water.

To raise and support armies, but no appropriation of money to that use shall be for a longer term than two years.

To provide and maintain a navy.

To make rules for the government and regulation of the land and naval forces.

To provide for calling forth the militia, to execute the laws of the Union, suppress insurrections, and repel invasions.

To provide for organizing, arming, and disciplining the militia, and for governing such part of them as may be employed in the service of the United States, reserving to the States respectively the appointment of the officers, and the authority of

of training the militia, according to the discipline prescribed by Congress.

To exercise exclusive legislation in all cases whatsoever over such district (not exceeding ten miles square) as may, by cession of particular States, and the acceptance of Congress, become the seat of the government of the United States, and to exercise like authority over all places purchased by the consent of the Legislature of the State, in which the same shall be, for the erection of forts, magazines, arsenals, dock-yards, and other needful buildings. And

To make all laws which shall be necessary and proper for carrying into execution the foregoing powers vested by this Constitution in the Government of the United States, or in any department or office thereof.

9. The migration or importation of such persons as any of the States now existing shall think proper to admit, shall not be prohibited by the Congress, prior to the year of one thousand eight hundred and eight; but a tax or duty may be imposed on such importation, not exceeding ten dollars for each person.

The privilege of the writ of *habeas corpus* shall not be suspended, unless when in cases of rebellion or invasion, the Public safety may require it.

No bill of attainder, or *ex post facto* law shall be passed.

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No capitation, or other direct tax, shall be laid; unless in proportion to the census or enumeration herein before directed to be taken.

No tax or duty shall be laid on articles exported from any State. No preference shall be given, by any regulation of commerce or revenue, to the ports of one State over those of another: nor shall vessels bound to or from one State be obliged to enter, clear, or pay duties in another.

No money shall be drawn from the Treasury, but in consequence of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time.

No title of nobility shall be granted by the United States; and no person holding any office of profit or trust under them shall, without the consent of the Congress, accept of any present, emolument, office, or title, of any kind whatever, from any King, Prince, or foreign State.

10. No State shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make any thing but gold and silver coin a tender in payment of debts; pass any bill of attainder, *ex post facto* law, or law impairing the obligation of contracts, or grant any title of nobility.

No State shall, without the consent of the Congress, lay imposts or duties on imports or exports, except what may be absolutely necessary
for

for executing its inspection laws; and the net produce of all duties and imposts, laid by any State on imports or exports, shall be for the use of the Treasury of the United States; and all such laws shall be subject to the revision and controul of the Congress. No State shall, without the consent of Congress, lay any duty of tonnage, keep troops or ships of war in time of peace, enter into any agreement or compact with another State, or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger, as will not admit of delay.

ARTICLE II.

1. The executive power shall be vested in a President of the United States of America. He shall hold his office during the term of four years; and together with the Vice-President, chosen for the same term, be elected as follows:

Each State shall appoint, in such manner as the Legislature thereof may direct, a number of electors equal to the whole number of Senators and Representatives to which the State may be entitled in the Congress; but no Senator or Representative, or person holding an office of trust or profit under the United States, shall be appointed an Elector:

The Electors shall meet in their respective States, and vote by ballot for two persons, of whom one at least shall not be an inhabitant of

the same State with themselves. And they shall make a list of all the persons voted for, and of the number of votes for each, which list they shall sign and certify, and transmit, sealed, to the seat of the government of the United States, directed to the President of the Senate. The President of the Senate shall, in the presence of the Senate and House of Representatives, open all the certificates, and the votes shall then be counted. The person having the greatest number of votes shall be the President, if such number be a majority of the whole number of electors appointed; and if there be more than one who have such majority, and have an equal number of votes, then the House of Representatives shall immediately choose by ballot one of them for President, and if no person have a majority, then from the five highest on the list the said House shall in like manner choose the President. But in choosing the President, the votes shall be taken by States, the representation from each State having one vote; a quorum for this purpose shall consist of a Member or Members from two-thirds of the States, and a majority of all the States shall be necessary to a choice. In every case, after the choice of the President, the person having the greatest number of voters of the electors shall be the Vice-President. But if there should remain two or more who have equal votes, the Senate shall choose from them by ballot the Vice-President.

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The Congress may determine the time of choosing the electors, and the day on which they shall give their votes; which day shall be the same throughout the United States.

No person, except a natural born citizen, or a citizen of the United States, at the time of the adoption of this Constitution, shall be eligible to the office of President; neither shall any person be eligible to that office, who shall not have attained to the age of 35 years, and been 14 years a resident within the United States.

In case of the removal of President from office, or of his death, resignation, or inability to discharge the powers and duties of the said office, the same shall devolve on the Vice-President, and the Congress may by law provide for the case of removal, death, resignation, or inability, both of the President and Vice-President, declaring what officer shall then act as President, and such officer shall act accordingly, until the disability be removed, or a President shall be elected.

The President shall, at stated times, receive for his services a compensation, which shall neither be increased or diminished during the period for which he shall have been elected, and he shall not receive within that period any other emolument from the United States, or any of them.

Before he enter on the execution of his office, he shall take the following oath or affirmation:

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“I do solemnly swear (or affirm) that I will faithfully execute the office of President of the United States, and will to the best of my ability preserve, protect, and defend, the Constitution of the United States.”

2. The President shall be Commander in Chief of the army and navy of the United States, and of the militia of the several States, when called into the actual service of the United States; he may require the opinion, in writing, of the principal officer in each of the executive departments, upon any subject relating to the duties of their respective offices, and he shall have power to grant reprieves and pardons for offences against the United States, except in cases of impeachment.

He shall have power, by and with the advice and consent of the Senate, to make treaties, provided two-thirds of the Senators present concur; and he shall nominate, and, by and with the advice and consent of the Senate, shall appoint Ambassadors, other public Ministers and Consuls, Judges of the Supreme Court, and all other officers of the United States, whose appointments are not herein otherwise provided for, and which shall be established by law. But the Congress may by law vest the appointment of such inferior officers as they may think proper, in the President alone, in the courts of law, or in the heads of departments.

The President shall have power to fill up all vacancies that may happen during the recess of the Senate, by granting commissions which shall expire at the end of their next session.

3. He shall from time to time give to the Congress information of the state of their Union, and recommend to their consideration such measures as he shall judge necessary and expedient: He may, on extraordinary occasions, convene both houses, or either of them, and in case of disagreement between them, with respect to the time of adjournment, he may adjourn them to such time as he shall think proper; he shall receive Ambassadors and other public Ministers; he shall take care that the laws be faithfully executed, and shall commission all the officers of the United States.

4. The President, Vice-President, and all civil offices of the United States, shall be removed from office on impeachment for, and conviction of, treason, bribery, or other high crimes and misdemeanors.

ARTICLE III.

1. The judicial power of the United States shall be vested in one Supreme Court, and in such inferior Courts as the Congress may from time to time ordain and establish. The Judges, both of the Supreme and Inferior Courts, shall hold their offices during good behaviour, and

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shall, at stated times, receive for their services a compensation, which shall not be diminished during continuance in office.

2. The judicial power shall extend to all cases in law and equity, arising under this Constitution, the laws of the United States, and treaties made, or which shall be made, under their authority; to all cases affecting Ambassadors, other public Ministers and Consuls; to all cases of Admiralty and maritime jurisdiction; to controversies to which the United States shall be a party; to controversies between two or more States, between a State and citizens of another State, between citizens of different States, between citizens of the same State claiming lands under grants of different States, and between a State, or the citizens thereof, and foreign States, citizens or subjects.

In all cases affecting Ambassadors, other public Ministers, and Consuls, and those in which a State shall be party, the Supreme Court shall have original jurisdiction, in all the other cases before-mentioned the Supreme Court shall have appellate jurisdiction, both as to law and fact, with such exceptions, and under such regulations as the Congress shall make.

The trial of all crimes, except in cases of impeachment, shall be by Jury; and such trial shall be held in the State where the said crimes shall have been committed; but when not committed within any State, the trial shall be at such place

or

or places as the Congress may by law have directed.

3. Treason against the United States shall consist only in levying war against them, or in adhering to their enemies, giving them aid and comfort. No person shall be convicted of treason unless on the testimony of two witnesses to the same overt act, or on confession in open court.

The Congress shall have power to declare the punishment of treason, but no attainder of treason shall work corruption of blood or forfeiture, except during the life of the person attainted.

ARTICLE IV.

1. Full faith and credit shall be given in each State to the public acts, records, and judicial proceedings of every other State. And the Congress may by general laws prescribe the manner in which such acts, records and proceedings shall be proved, and the effect thereof.

2. The citizens of each State shall be entitled to all privileges and immunities of citizens in the several States.

A person charged in any State with treason, felony, or other crime, who shall flee from justice, and be found in another State, shall, on demand of the executive authority of the State from which he fled, be delivered up, to be removed to the State having jurisdiction of the crime.

No person held to service or labour in one State, under the laws thereof, escaping into any other, shall, in consequence of any law or regulation therein, be discharged from such service or labour, but shall be delivered up on claim of the party to whom such service or labour may be due.

3. New States may be admitted by the Congress into this Union; but no new State shall be formed or erected within the jurisdiction of any other State; nor any State be formed by the junction of two or more States, or parts of States, without the consent of the Legislatures of the States concerned, as well as of the Congress.

The Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States; and nothing in this Constitution shall be so construed as to prejudice any claims of the United States, or of any particular State.

4. The United States shall guarantee to every State in this Union a Republican form of government, and shall protect each of them against invasion; and on application of the Legislature, or of the executive (when the Legislature cannot be convened) against domestic violence.

ARTICLE V.

The Congress, whenever two-thirds of both Houses shall deem it necessary, shall propose amendments

amendments to this Constitution, or, on the application of the Legislatures of two-thirds of the several States, shall call a Convention for proposing amendments, which, in either case shall be valid to all intents and purposes, as part of this Constitution, when ratified by the Legislatures of three-fourths of the several States, or by Conventions in three-fourths thereof, as the one or the other mode of ratification may be proposed by the Congress: provided that no amendment which may be made prior to the year one thousand eight hundred and eight, shall in any manner affect the first and fourth clauses in the ninth section of the first Article; and that no State, without its consent, shall be deprived of its equal suffrage in the Senate.

ARTICLE VI.

All debts contracted, and engagements entered into, before the adoption of this Constitution, shall be as valid against the United States under this Constitution, as under the Confederation.

This Constitution, and the laws of the United States which shall be made in pursuance thereof; and all treaties made, or which shall be made, under the authority of the United States, shall be the supreme law of the land; and the Judges in every State shall be bound thereby, any thing in
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the Constitution or laws of any State to the contrary notwithstanding.

The Senators and Representatives before mentioned, and the Members of the several State Legislatures, and all executive and judicial officers, both of the United States and of the several States, should be bound by oath or affirmation to support this Constitution; but no religious test shall ever be required as a qualification to any office or public trust under the United States.

ARTICLE VII.

The ratifications of the Conventions of nine States should be sufficient for the establishment of this Constitution between the States so ratifying the same.

Done in Convention, by the unanimous consent of the States present, the seventeenth day of September, in the year of our Lord one thousand seven hundred and eighty-seven, and of the Independence of the United States of America the twelfth. In witness whereof we have hereunto subscribed our names.

GEORGE WASHINGTON, President,
And Deputy from Virginia.

John Langdon, Nicholas Gilman—*New Hampshire.*

Nathaniel Goreham, Rufus King—*Massachusetts.*

William

William Samuel Johnson, Roger Sherman—*Connecticut.*

Alexander Hamilton—*New York.*

William Livingston, David Brearley, William Paterfon, Jonathan Dayton—*New Jersey.*

Benjamin Franklin, Thomas Mifflin, Robert Morris, George Clymer, Thomas Fitzsimons, Jared Ingerfol, James Wilson, Gouverneur Morris—*Pennsylvania.*

George Read, Gunning Bedford, jun. John Dickinson, Richard Bassett, Jacob Broom, *Delaware.*

James M^cHenry, Daniel of St. Thomas Jenifer, Daniel Carroll—*Maryland.*

John Blair, James Madison, jun.—*Virginia.*

William Blount, Richard Dobbs Spaight, Hugh Williamson—*North Carolina.*

John Rutledge, Charles Cotesworth Pinckney, Charles Pinckney, Pierce Butler—*South Carolina.*

William Few, Abraham Baldwin—*Georgia.*

Attest. William Jackson, Secretary.

IN CONVENTION, Monday, Sept. 17, 1787.

P R E S E N T,

The States of New Hampshire, Massachusetts, Connecticut, Mr. Hamilton from New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, North Carolina, South Carolina, and Georgia :

Resolved

Resolved,

THAT the preceding Constitution be laid before the United States in Congress assembled, and that it is the opinion of this Convention, that it should afterwards be submitted to a Convention of Delegates, chosen in each State by the people thereof, under the recommendation of its Legislature, for their assent and ratification; and that each Convention assenting to, and ratifying the same, should give notice thereof to the United States in Congress assembled,

Resolved,

That it is the opinion of this Convention, that as soon as the Conventions of nine States shall have ratified this Constitution, the United States in Congress assembled should fix a day on which Electors should be appointed by the States which shall have ratified the same, and a day on which the Electors should assemble to vote for the President, and the time and place for commencing proceedings under this Constitution. That after such publication the Electors should be appointed, and the Senators and Representatives elected: That the Electors should meet on the day fixed for the Election of the President, and should transmit their votes certified, signed, sealed, and directed, as the Constitution requires, to the Secretary of the United States in Congress assembled, that the Senators and Representatives should convene at
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the time and place assigned; that the Senators should appoint a President of the Senate, for the sole purpose of receiving, opening, and counting the votes for President; and that, after he shall be chosen, the Congress, together with the President, should, without delay, proceed to execute this Constitution.

By the unanimous Order of the Convention,
 GEORGE WASHINGTON, President.
 WILLIAM JACKSON, Secretary.

THE CHARACTER OF

GENERAL WASHINGTON.

GENERAL WASHINGTON was born February 11, O. S. 1732, in the parish of Washington, in Westmoreland County, in Virginia: His ancestors were from England as long ago as 1657: He had his education principally from a private tutor; learnt some Latin, and the art of surveying. When he was fifteen years of age, he entered as a midshipman on board a British vessel of war, that was stationed on the coast of Virginia; but the plan was abandoned, on account of the reluctance his mother had against it.

He was appointed a Major of a regiment before he was twenty years old; and as the French had

made encroachments on the English settlements, he was sent in 1753, by Lieutenant-Governor Dinwiddie, then Commander of the Province, to treat with the French and Indians, and to warn them against making encroachments, &c. He performed the duties of his mission with fidelity.

In 1754 the colony of Virginia raised a regiment for its defence, which was put under the command of Colonel Fry, and Major Wallington was appointed Lieutenant-Colonel of the same; but the Colonel died that Summer, without joining the regiment, and the command fell to the Lieutenant-Colonel.

After forming his regiment, establishing magazines, opening roads, and sundry marches, he built a temporary stockade, at a place called the Great Meadows; and though his forces did not amount to four hundred effective men, he sallied out, and defeated a number of the enemy, who were coming to reconnoitre his post; but on his return was attacked by an army about 1500 strong; and after a gallant defence, in which more than one third of his men were killed and wounded, he was obliged to capitulate. The garrison marched out with the honours of war, but were plundered by the Indians, in violation of the articles of the capitulation. After this the remains of his regiment returned to Alexandria, in Virginia, to be recruited, &c.

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In 1755, "As no officer who did not immediately derive his commission from the King could command one who did," Colonel Washington relinquished his regiment, and went as an *extra Aid-de-Camp* into the family of *General Braddock*, who was sent to drive the French, &c. from the borders of the English settlements.

The General was afterwards killed at the battle of Monongahela, and his army defeated, where Colonel Washington displayed his abilities, in covering a retreat, and saving the remains of the army.

Afterwards the supreme authority of Virginia gave him a new and extensive commission, whereby he was appointed Commander of all the troops raised, and to be raised, in that Colony.

He conducted as a good officer in defending the frontiers against the enemy, and in 1758 he commanded the *van brigade* of *General Forbes's* army, in the capture of *Fort du Quesne*; and by his prudent conduct, the tranquillity of the frontiers of the middle Colonies was restored. But he resigned his military appointment in 1759, by reason of his being ill of a pulmonic complaint.

As his health was afterwards gradually restored, he married a *Mrs. Custis*, who was born the same year that he was: She was a handsome and an amiable young widow, possessed of an ample jointure, and he settled as a planter and a farmer on the estate where he now resides, in *Fairfax county*.

county. After some years, he gave up planting tobacco, and went altogether into the farming business. He has raised 7000 bushels of wheat and 10,000 of Indian corn in one year. His domestic plantation contains about 9,000 acres, and he possesses large quantities of excellent lands in several other counties.

He thus spent his time in cultivating the arts of peace, but was constantly a Member of the Assembly, a Magistrate of his county, and a Judge of the Court. In 1774, he was elected a Delegate to the first Congress, and was chosen again in 1775; the same year he was appointed by Congress Commander in Chief of the Forces of the United Colonies.

His conduct as a General is so well known, that it is needless for me to say much upon the subject. He went through many hardships, perils, and dangers, and conducted his military operations with such great skill, that at last a peace commenced in 1783, whereby thirteen of the American Colonies were established as Sovereign and Independent States.

Afterwards he resigned his commission to Congress, and retired to his plantation in Virginia.

Some time after the peace commenced, he received a *diploma* from the University at Cambridge, in the Commonwealth of Massachusetts, constituting him a *Doctor of Laws*.

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He is very regular, temperate, and industrious; rises in Winter and Summer at the dawn of the day; generally reads or writes some time before breakfast; breakfasts about seven o'clock on three small Indian hoe cakes and as many dishes of tea, and often rides immediately to his different farms, and remains with his labourers till a little after two o'clock, then returns and dresses. At three he dines, commonly on a single dish, and drinks from half a pint to a pint of Madeira wine. This, with one small glass of punch, a draught of beer, and two dishes of tea (which he takes half an hour before the setting of the Sun) constitutes his whole sustenance until the next day. But his table is always furnished with elegance and exuberance; and whether he has company or not, he remains at the table an hour in familiar conversation, then every one present is called upon to give some absent friend as a toast.

His temper is of a serious cast, and his countenance carries the impression of thoughtfulness; yet he perfectly relishes a pleasant story, an unaffected sally of wit, or a burlesque description, which surprizes by its suddenness and incongruity, with the ordinary appearance of the object described. After he has dined he applies himself to business, and about nine retires to rest; but when he has company, he attends politely upon them till they wish to withdraw.

His family consists of eight persons, but he has no children : He keeps a pack of hounds, and in season goes a hunting once in a week, in company with some of the gentlemen of Alexandria.

Agriculture is his favourite employment : He makes observations concerning the produce of his lands, and endeavours to throw light upon the farmer's business.

Linen and woollen cloths are manufactured under his roof, and order and œconomy are established in all his departments, both within and without doors.

In 1787, he was chosen President of the Federal Convention that met at Philadelphia, and framed the new Constitution ; and since that time, he has been chosen President of Congress, and has a salary of twenty-five thousand dollars *per annum*.

Some have pretended that he is a native of England ; but I understand that he never was in Europe.

C H A P. XLVIII.

How Provinces, Counties, Townships, and Highways, ought to be laid out. The Lengths and Breadths of the American Governments. The Longitudes, Latitudes, Bearings, and Distances of the principal Towns from Philadelphia.

I Have observed, that some of the American Governments are too large, and that others are too small; for the Province of Quebec is 300 miles in length, and 200 in breadth; Virginia is 758 miles long, and 224 broad; Rhode-Island is 63 miles in length, and 40 in breadth; and Delaware is 92 miles long, and but 16 broad, according to accounts given of their limits.

Where they are too large, some of the Legislatures must be at a great distance from the seat of Government. Hence, those who live in the westerly parts of Canada must be four or five hundred miles from Quebec, where the Legislators convene, which is very inconvenient, as the fatigue and expence of travelling is very great. Some of the other Governments are also too large, and others too small.

I should admire at the Provinces being laid out in such forms, were it not for the newness of the country,

country, and the various grants of lands that have from time to time been given by former Kings to emigrants who received charters, specifying different limits, and settled in America.

Some counties are also too long, some are too narrow, some too large, and others too small; and the same may be said of townships and parishes.

Would it not be more convenient, if the Provinces were about 100 miles square, the counties 25, and the townships six and a quarter?—A State of this magnitude, divisions, and sub-divisions, would contain 16 counties, and each county 16 townships, making 256 townships in the whole; and if every township was allowed to send a Representative to a General Assembly, there would be 256 Legislators, besides the Governors and Councillors, which would be an Assembly large enough for a Province or State.

It may be most convenient for Legislators to meet in the center of a province, the Judges in the center of a county, and people in the center of a town or parish, for the transaction of business, and the performance of religious worship.

I have observed, that where churches have been built remote from the centers of towns and parishes, it has been the cause of much disturbance amongst the inhabitants, because some have had to travel a great way to get to church.

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The highways in America ought to be at least an hundred feet wide, and especially where the snow falls deep; for where they are too narrow, they will be often filled to the tops of the fences when the snow is not more than eight inches deep upon a level; for the snow that is carried over one fence by the wind lodges against the other, if the road is full, which endangers the lives of travellers, and proves a great hindrance to the transaction of business. Some are so stingy, that they will not allow a highway to be fenced wide enough, because they suppose that they shall lose the profits of their lands; but this is a mistake, for the land in a highway will serve for a pasture for cattle, sheep, &c. whilst the people are freed from the labour and expence of fencing it.

I do not pretend to say, that every government, county, and township, can be laid out exactly in the form that I have mentioned: I know that some places are almost surrounded by the sea, as the peninsula on which the town of Boston, in the Massachusetts, is built, and many other places, where there is not room for a town of the bigness I have recommended; but where there is room, it will be best to lay them out in a regular form, &c.

But the globular form of the globe may, in some measure, interrupt my plan of laying out all the provinces, on a great continent, exactly square; for some allowance ought to be made,

for the variation of the degrees of longitude in the different parallels of latitude.

Hence, if on the lat. of 40 degrees north, we should measure 100 miles south on the meridian of Philadelphia, and set up a boundary for the south-easterly corner of a province, and should measure 100 miles west to the south-west corner, then exactly north 100 miles; and from thence to where we began, we should find that the north line would not be so long as the south by about $\frac{2}{100}$ of a mile, for the degrees of longitude are shorter in the northern than in southern parallels of latitude. Vid. Tab. p. 75.

The kingdom of France is about 662 miles in length, from north to south, and 620 in breadth, from east to west; and since the late Revolution, the National Assembly have divided it into 80 grand divisions, or counties, of 18 leagues in length, and as many in breadth; and each grand division into 9 commonalties, which are 6 leagues square; and also each commonalty into 9 cantons, of 2 leagues in length and 2 in breadth.

Hence there are 80 grand divisions; 720 commonalties, and 6480 cantons. Each commonalty sends one Representative to the National Assembly. Hence also, as a French league is longer than an English, the cantons are about the bigness of the townships which I have recommended.

The following Table exhibits the different forms, &c. of the North-American Governments.

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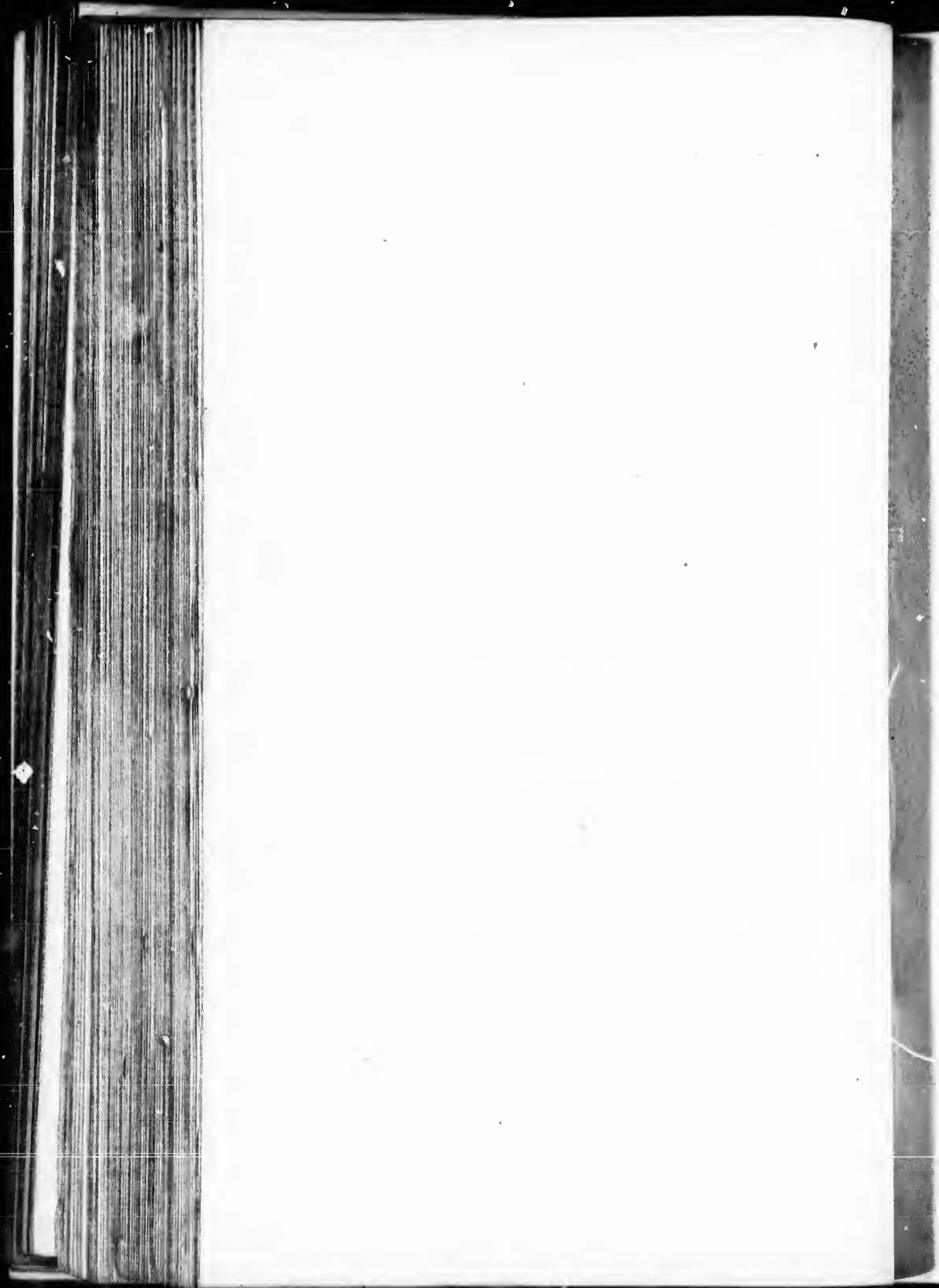
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DIVISIONS OF NORTH-AMERICA.

<i>Names of States and Colonies.</i>	<i>Length. Miles.</i>	<i>Breadth. Miles.</i>	<i>Chief Towns.</i>	<i>Latitude. Deg. Min.</i>	<i>Longitude from Philadelphia. Deg. Min.</i>	<i>Distance and bearing from Philadelphia. Miles. Points.</i>
New Hampshire	180	60	Portsmouth.	43	3	408 N. E.
Massachusetts	450	164	Boston.	42	3	343 N. E.
Rhode-Island	68	40	Newport.	41	3	280 E. N. E.
Connecticut	81	57	Newhaven.	41	1	181 N. E.
New-York	350	300	New-York.	40	1	95 E. N. E.
New-Jersey	160	52	Trenton,	40	0	30 N. E.
Pennsylvania	288	156	Philadelphia.	39	0	0
Delaware	92	16	Dover.	39	0	0
Maryland	134	110	Annapolis.	39	2	72 S. S. W.
Virginia	758	224	Richmond.	37	2	132 S. W.
North-Carolina	758	110	Edenton.	36	4	276 S. W.
South-Carolina	200	125	Charlestown.	32	1	442 S. S. W.
Georgia	600	250	Augusta.	33	3	814 S. S. W.
Vermont	155	60	Bennington.	42	1	934 W. S. W.
Western Territory	1000	450	Adelphi.	39	6	299 N. by E.
Kentucky	800	200	Lexington.	38	25	492 W.
Province of Quebec	300	250	Quebec.	46	55	947 by Water W.
Nova Scotia	600	130	Halifax.	44	50	690 N. N. E.
East and West Floridas	indefinite	indefinite	St. Augustine.	29	6	925 N. E.
Louisiana	indefinite	indefinite	New Orleans.	29	51	1146 S. S. W.
New Mexico	765	212	St. Fee.	36	3	1646 S. W.
California	2700	250	St. Juan.	26	5	2190 W.
Old Mexico			Mexico.	20	26	3396 W. S. W.
						5021 S. W.

The distances of the capital towns from Philadelphia are reckoned as the roads run, and not according to the circles of Latitude and Longitude.



C H A P. XLIX.

Of Architecture.—How Cities, Churches, Houses, &c. ought to be built.—Magnificent Edifices, the Seven Wonders of the World.—The Danger of living in open Houses, and of Sleeping in New Plastered Rooms.—Of the Vanity of Destroying Wood too fast.—Directions concerning the Preservation of Trees, and the Planting of Forests and Orchards.—How Prisons should be Constructed, and Prisoners managed, to prevent the Generation of Malignant Distempers.

ARCHITECTURE was first carried to a tolerable high pitch by the Tyrians, the Greeks took it from them, the Romans from the Greeks, and the English from the Romans. The Romans first introduced the building with brick, and that of stone was brought into England A. D. 670. In 886, the English began to build with brick, but it did not become general in Great Britain till 1600, when the Earl of Arundel promoted it. This art, in many places, is brought to a high degree of perfection in the present age; though in others, the mysteries of it are much hidden

hidden in many respects, and buildings are frequently erected to disadvantage, and the materials almost spoiled. I have observed in the great cities of London, Westminster, Bath, Bristol, Edinburgh, Glasgow, Dublin, Paris, Philadelphia, and other cities in England, Scotland, Ireland, France, and America, that a great number of the houses are almost ruined by reason of their being wrongly constructed. Rooms are frequently made so small that they are very inconvenient, and numbers of the streets are built so narrow, that it is dangerous passing, and especially among teams, coaches, &c. Many of those houses ought to be taken down and rebuilt, with streets 100 feet in breadth, laid out in a regular manner; but the fashion of making such narrow streets seems to be wearing away in Great Britain, and elsewhere; for many houses and other buildings have been taken down of late, the streets made wider, and the buildings rebuilt in a more commodious form, which does honour to the Architects and others concerned in the work.

The wharfs in sea ports, ought to be made wide; hence the buildings should be erected at a distance, to leave room for the laying of lumber and other commodities.

When a city is built, the streets ought to run straight and at right angles with each other, and to be 100 feet wide; the squares betwixt them should be about 40 rods each way: The houses should

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should be built of brick or stone, and be four flo-
 ries high, covered with slate, tyle, or lead, to
 secure them from the fire; and conductors ought
 to be erected to preserve the buildings from being
 injured by the lightening. A dwelling house
 ought to be about 46 feet in length, and 38 in
 breadth, with a passage through the middle about
 10 feet broad. The rooms ought to be at least 18
 feet long, 16 broad, and 9 or 10 feet high. The
 doors and windows, ought to be of a suitable
 length and breadth, and the chimneys should be
 set against the middle of the rooms, and be drawn
 in, till the draught against the mantle piece, is
 very small. If it should be said that a small pas-
 sage would obstruct the ingress of the chimney
 sweepers; I answer, that a back made of sheet, or
 cast iron, might be constructed and placed in such
 a manner, as to answer all the intentions of one
 made of brick; and it might easily be taken out
 and replaced again, as occasion may require.
 Then the draught ought to be made larger and
 larger, which will prevent the smoke from puff-
 ing out into the rooms; the force of the fire send-
 ing it through a narrow passage will prevent its
 returning by the pressure of the atmosphere above;
 but remember, that the top of a chimney must be
 built upon a perpendicular over the fire-place,
 otherwise the smoke will descend into the room;
 for if it is obstructed by turnings and windings, it
 will

will fly the wrong way, as it is as natural for smoke to fly upwards as it is for a stone to fall downwards; hence chimneys should stand erect. Cities ought to be kept clean, and proper canals of water turned under them, to carry off the filth, and prevent the generation of diseases. Churches, palaces, and other buildings, ought to be proportioned in such a manner as to make them convenient, a large room ought not to be square, but in the form of an oblong.

An Architect ought to be well skilled both in the theoretical and practical parts of the business. The theory demonstrates how to plan out the work in proportions requisite to form the fabric, and the practical, how to execute the business in the most expeditious and advantageous manner.

Architecture consists of three different classes, as:

1. Civil; or the building of houses, churches, colleges, temples, palaces, halls, bridges, porticos, &c. for the uses of civil life.
2. Military; as fortifications, ramparts, &c. for defence against an enemy.
3. Naval; as the building of docks, and all kinds of vessels to float on the water, with the works belonging to them.

The laws of nature taught the ancients to build houses to screen themselves and families from the inclemency of the weather. It is said, that before the Romans invaded England, the natives had no better lodgings than thickets, dens, and caves.

Some of those caves were for winter habitations, and places of retreat in time of war. The Savages in America have followed much the same example, having lodged in dens and caves, among the rocks and mountains, like the wild beasts, for the want of knowledge in Architecture.

We have an account in history, of many wonderful superstructures, as: 1. The tower of Babel, which was 40 years in building. 2. The walls of Babylon, which were 60 miles in circumference, 587 feet thick, and 1350 feet high; through the walls were 100 gates.

3. The Pyramids of Egypt, the largest of which covers 11 acres and a quarter of land, and is near 500 feet high.—4. Solomon's temple, which was adorned with gold and many splendid ornaments.

5. The wall of China, which is 1500 miles in length, and 30 feet high; and of many other noble structures, edifices, and temples, which denote that Architecture shone forth with great lustre and perfection among the ancients, though perhaps, not with that splendor it does in the present age.

Authors disagree so much in the accounts of the measures of antiquity, that it is difficult to determine what the dimensions of some ancient buildings were, as some have taken one measure and some another, without telling us what measure they meant, whether it was English, Romish, &c. The following table shews the different feet that have

Some

have been made use of among the nations, equivalent to 12 inches, English measure, being divided into 1000 equal parts.

English	—	—	1000
Romish	—	—	967
French	—	—	1068
Spanish	—	—	920
Venetian	—	—	1032
Rhinland	—	—	1033
Florentine	—	—	1913
Naples	—	—	2190
Cairo	—	—	1824
Turkish	—	—	2200

Hence it appears that a Turkish foot, is more than as long again as an English, and that the Romish and Spanish feet are shorter; but would it not be best to have the measures and weights alike through the world, if the nations would agree to it, as was before observed.

Every part of a building made of timber ought to be painted to prevent it from rotting, and to keep the doors and windows from swelling in wet weather. Wooden houses well painted once in three years, will last a long time; but if they stand without paint, they will soon rot, and waste away.

Some are at a great expence in adorning their buildings with splendid ornaments, such as blank doors and windows, tablets, medallions, with bas
and

and alto relievos, statues, bufts, niches, vases, enriched ceilings, mouldings, foliage, rustics, pilasters, columns, arches, intercolumnations, balustrades, &c.

It is very dangerous to live in open houses, or to sleep in new plastered rooms, for our bodies require a sufficient degree of heat to keep their fluids in circulation. I was taught when I was young, that open rooms are the most healthy; but I found by my own observation, that that opinion is absurd; for I have frequently observed, that where people have been obliged as it were to roast one side, whilst the other was almost freezing, that they were often afflicted with colds, coughs, catarrhs, consumptions, quinseys, pleurisies, peripneumonies, and other disorders, whilst others, who had lived in warm rooms, have been free from those complaints.

Many of the houses in Canada are built of stone: their walls are about two feet thick; the rooms are large and are kept warm in winter with stoves, situated in such a manner, as to warm every part of the rooms, and make the people comfortable in the remotest corner; but a small quantity of fuel is expended, and the people were so remarkably healthy, that I could scarcely hear a person cough in a large congregation, whilst the stoves were kept up; but when they were taken down, which happened in May or June, the rooms grew too damp and cold, and the inhabitants were afflicted

afflicted with colds, coughs, and other disorders of the lungs. Some who have ventured to sleep in new plaistered rooms, have been found dead the next morning, owing to the coldness and dampness of the walls.

It is dangerous to stand still, sit, or sleep, with the doors, or windows open; or where there are holes that let in the air, because it will make people take cold; where they follow this practice in the shops and public houses in London, I have heard the inhabitants complain of head aches, coughs, &c. whereas, if they would only keep their rooms tight and warm, they might be freed of those complaints. But some have imbibed an opinion, that they draw more customers by keeping open doors, &c.

Some people have stoops or piazzas by the sides of their houses, where they frequently sit in the open air and take cold, by having their perspiration obstructed by the cool breezes of the wind; but I disapprove of this practice, unless the weather is very warm, calm, and pleasant.

There are several orders of Architecture, all of which have their proportions as :

I. The Tuscan, which is void of ornaments, and the most solid, and capable of bearing the heaviest burthen.

II. The Doric, the next in strength to the Tuscan, which is the most ancient order in the world.

III. The

III. The Ionic; this is more splendid than the Doric, and has but few ornaments.

IV. The Corinthian, this has elegant proportions, adorned with splendid ornaments.

V. The Composite; this is only a species of the Corinthian order.

As it is not my design to be prolix upon any subject in the *American Oracle*, I shall not branch out largely upon Architecture, but conclude by observing, that an Architect ought to have so much geometrical and philosophical knowledge; as to know how to choose the best materials, and construct a building in the best manner. He should see that the foundation he builds upon is good, the materials he builds with are sound, and that the work is carried on with regularity in the building of towers, castles, houses, temples, palaces, markets, theatres, amphitheatres, villages, towns, cities, streets, wharfs, lanes, courts, &c.

The wars that have frequently broke out amongst the nations, have been a great hindrance to the flourishing of Architecture, as well as to that of other arts and sciences. Hence men of great learning and ingenuity have been slain, famous libraries burnt, elegant towns and cities laid waste; and some arts wholly lost; amongst others, that of making cement, which is said to be stronger than brick or stone. Had there not been any bloodshed and devastation, and had the nations been

united in doing one another good instead of evil; and had the armies been employed in cultivating the land, in digging down mountains, filling up vallies, the building of bridges, towns, cities, &c. would it not have been much better for the inhabitants of the world? Would not the arts and sciences have been brought to a higher degree of perfection, and the globe adorned and beautified with much more riches, splendor, and magnificence, collected and deposited for the promotion of the happiness of mankind, than at the present day?

I will just mention the seven wonders of the world, but had there been no wars, it is probable there would have been more than a thousand wonders before this time. I will set them in their proper order, though some of them are already mentioned in this chapter.

1. The Pyramids of Egypt.
2. The Mausoleum, or tomb built for Mausolus, King of Caria, by Artemisia his Queen.
3. The temple of Diana at Ephesus.
4. The walls and hanging gardens of Babylon.
5. The brazen image of the sun at Rhodes, called the Colossus. It stood with one foot on one island, and the other on another, so high that a ship with its masts and sails up could sail between its legs. It was shaken down by an earthquake 224 years before Christ.
6. The rich statue of Jupiter Olympius.

7. The

7. The watch tower, built by Ptolemy Philadelphus, King of Egypt.

It is too much the practice in New England, and in some other places in America, to build houses, barns, &c. of timber; but it would be much better to build with brick or stone, and to cover them with slate or tile, instead of shingles, as they would be warmer, more durable, and more secure from taking fire, which, though commonly a good servant, is sometimes a bad master.

A room may be kept too warm, but this I also disapprove, because it may make people sweat, melt the fluids, relax the solids, and lay a foundation for some dangerous malady. Those who have fat in a warm room ought to put on a cloak or great coat when they go into the open air, and especially if the weather is very cold, or stormy.

There is a vanity which prevails in many parts of America that will make the future generations groan:—It is the rapid destruction of the wood, which is almost totally cut off in some new places, as well as in those which have been settled a long time. In some places which have not been settled more than twenty or thirty years, scarce any thing is left either for fuel or timber. Hence future generations will be greatly pinched with the cold, and especially in towns remote from pits of coal, which are very scarce in this part of the world, as

none have been discovered, excepting in Newfoundland, Louisbourg, Nova Scotia, or New Brunswick, and North Carolina, if I mistake not. How distressing then must the condition of those who may live two or three hundred miles from any sea port, or place where coal can be procured, when the trees are cut off and nothing can be had for fuel, or timber? they must of course be pinched with the cold, and put to great difficulty in carrying on their cookery, &c.

People have been so greatly distressed already in some places in America, that they have been obliged to burn their barns, fences, and even their household furniture, to keep from perishing with the cold; and wood has been sometimes so very scarce and dear at New-York, that it has been sold for forty dollars, or nine pounds sterling, per cord.

Therefore, for the prevention of such calamities as much as possible, I will recommend,

1. The building of warm, tight houses, with brick or stone.
2. The use of stoves, and the consumption of a small quantity of fuel.
3. The preservation of trees already grown.
4. The planting and pruning of forests in places where they are wanted.
5. The raising of orchards, consisting of apple trees, pear-trees, peach-trees, plumb-trees, cherry trees, &c. which are beneficial both for fruit and fuel.

fuel. But perhaps large quantities of coal mines may be discovered in some future time in places where fuel may be wanted. Coals are very cheap and plenty in Scotland, and I believe it is as cheap keeping a fire there, as it is in America, where wood is plenty. They are also very plenty in London, but they are dear by reason of a duty which is laid upon them.

Farmers ought to have wood lots near their houses, to keep their fuel housed, and a good stock by them; and especially in the Northern climates, where the snow sometimes falls so deep, that the teams cannot travel to the forests.

Different kinds of stoves have been used in America. They are chiefly tight in the Northern Governments, that is, the fire is shut up so that it cannot be seen, unless a door is opened; they are chiefly made of sheet or cast iron. But I have seen an open kind of stoves at Philadelphia, which were invented by some body about sixty miles westerly of that city. They have been called Franklin's stoves, because Dr. Franklin wrote upon their utility.

It has been said, that one cord of wood will do as much good, and go as far in a stove, as four would in a chimney. Hence, stoves must be of great service where ever they are used.

When the surrounding atmosphere is colder than the rarified air in a room, it will rush in if the doors or windows are opened, and continue

so to do until an equilibrium is restored, and chill those who have been warmed by the heat of a fire. But if the air in a room is colder than the atmosphere, and the doors, &c. are opened, the cold air will expand itself into the warm until an equilibrium is restored that way.

I shall conclude this chapter by making some observations on Prisons, and the management of prisoners.

Prisons ought to be situated in places where the air is good; and streams of water ought to be conveyed under them to keep them clean.

Various plans have lately been invented for the construction of prisons, but it is not much matter how they are built, provided the apartments are convenient. The rooms ought to be large, and those confined ought not to be too much crowded, because it may breed distempers, which cut down not only the prisoners, but spread to a great distance and almost depopulate the country. By chronology we are informed, that 300 persons, at the assizes at Oxford, caught a gaol distemper, and died in 1577, and that many took the same distemper at the Old Bailey, in London, and died in 1750, &c.

Now we may reasonably suppose, that this distemper was generated by the want of a proper air, a proper regimen, cloathing, and exercise, and by the prisoners being too much crowded, and that by their being thus, infected by a contagion, it was

was communicated to others when the prisoners were brought to trial before the the Courts of Justice.

The treatment that prisoners have met with in many parts of Christendom in time past would disgrace the most barbarous nations. Some have perished by being kept in pits and dungeons, some have lost their lives by being pent up in narrow places, where they could not lie down, and by being crowded to death by the company. Some have been smothered till they have lost their lives for the want of air, and some have perished with the cold, hunger, nakedness, and the like. Prisons about 100 feet in length, 50 in breadth, and three or four stories high, with entries, or passages about 10 feet wide, through the middle of each story from end to end, would be very convenient, in my opinion. The apartments might then be made large, and the Prison-keeper might easily convey to a considerable number of prisoners, those things they daily need for their sustenance. If a prisoner is taken ill, he ought to be kept in some apartment by himself to prevent the spreading of malignant disorders; they ought to be kept clean and warm, and to use gentle exercise, and also to have a good and wholesome diet.

Let men, or women, who may be confin'd,
Unto their mortal bodies be so kind,
As to take care that they *shun* ev'ry thing
Which may amongst them bad *disorders* bring

If they desire in good health to abide,
Whilst they're oblig'd in prison to reside,
Let this thing always in their mind remain,
That from intemp'rance they must all refrain:
Abstain from drunk'ness, anger, rage and strife,
And aim to live an upright, steady life.
Read and discourse with pleasure and delight,
Both in the day, and in the silent night.
Go to bed early, see that ye arise
Nigh to the time the sun does in the skies;
Wash clean your face, comb out your matted hair,
And if need be, see that your nails ye pare:
Keep up your spirits, often talk and laugh,
And walk around, with, or without a staff:
Tell pleafant stories, make the air to ring,
With a loud voice, when ye attempt to sing;
And often times, if you can get a chance,
Divert yourselves with music, and a dance.
If you wou'd rest and not live in a teafe,
Destroy the bed bugs, kill off all the fleas;
From other vermin always mind and see
That ye at all times keep exceeding free.
Sweep oft your room, don't spit upon the floor,
And keep no dirt within the prison door.
From all bad scents pray keep exceeding clear,
Lest some destructive thing shou'd soon appear.
When noxious vapours float within the air,
And bad distempers spread both here and there,
Amongst you let tobacco fumes arise,
Whose virtues are extoll'd unto the skies:

And

And vinegar burnt often in the day,
 Is good to drive all noxious things away.
 By what I've seen, I'm sure I can resist,
 That putrefaction it will much resist.
 Another thing I also do desire,
 That in your room you'll keep a constant fire ;
 For it is good, *Philosophers* declare,
 To cleanse and purify the stagnant air.
 Of wholesome things let all your food be made,
 Go cleanly dressed, and mind what I have said ;
 Lest whilst in prison ye have to remain,
Diseases spread 'till you by them are slain.
 My best advice I freely thus do give,
 And wish mankind in happiness may live ;
 That honest prisoners always may be free
 From illness, and be set at liberty :
 And that at last they may come to the *shore*
 Where *loathsome Prisons* shall *afflict* no more.

LONDON, *May 14, 1791.*

C H A P. L.

A Short History of the RISE, SUFFERINGS, DOCTRINES, and DISCIPLINE of the FRIENDS, commonly called QUAKERS.

IN the beginning of the 17th century there were great dissensions in Great Britain respecting Religion; many who had been dissatisfied with the settlement of the Church of England in the reign of Queen Elizabeth, dissented, and formed themselves into various societies, some of whom evinced their sincerity by grievous sufferings, under the intolerance of those who governed church affairs.

In those times George Fox began to travel, and to preach the principles and doctrines which the Friends adhere to; as he travelled he met with divers who readily received his testimony, and several of them became preachers of the same doctrine; multitudes were afterwards converted, and many meetings were settled.

But many of these people were persecuted on account of their religious sentiments, by stripes, imprisonments, and other inhumanities.

George

George Fox, was one of the first of the Friends who was imprisoned. He was confined at Nottingham, in the year 1649. The next year he was brought before two Magistrates in Derbyshire, where one of them scoffing at George Fox, for having bidden him and those about him to tremble at the word of the Lord, gave those people the name of *Quakers*, which appellation is retained to this day: But they have always called themselves *Friends*.

The Friends suffered persecution in England, in the days of Oliver Cromwell, and in the reign of King Charles II. but it does not appear that either Cromwell, or the King, was very severe against them. The persecution was chiefly carried on by the Magistrates, and other barbarous and inhuman persons of an inferior rank.

The first Friends that went to Boston, in New-England, were women; at that place they were imprisoned and cruelly treated, this happened in 1656. The following year the scourge was employed, and a law was made for cutting off their ears, which was executed. They were afterwards subjected to banishment on pain of death, and three men and one woman were actually hanged. The Friends were also persecuted in some of the other American Governments, but I believe not with such severity.

In 1661 Samuel Shattock, a banished *Friend* from Boston, obtained a mandamus from the King to
return

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return to Boston as a Deputy, and put a stop to the severities in New-England, which was accordingly done.

In 1664 sixty of the Friends were transported from England to America, by an order of Council.

In 1672 King Charles II. released about four hundred of the Friends from confinement. But after his death, as they were not protected by law, about fifteen hundred were imprisoned, by reason of the implacable malice of their old persecutors.

About the year 1675 Robert Barclay wrote an apology in vindication of the principles and doctrines of the Friends, and presented it to King Charles II.

In the reign of King James II. the operation of the penal laws against Dissenters were suspended, and the Friends were sharers in the benefit. But it was not until the reign of King William that they obtained some degree of legal protection. In the reign of William and Mary, about the year 1696, an act was passed, which with a few exceptions, allowed to their affirmation the legal force of an oath, and provided a less oppressive mode of recovering tithes, under a certain amount: Those provisions were made perpetual in the reign of George I. and thus the Friends, in common with other Dissenters, received the advantage of the act of toleration which had been passed in the year 1689. The Friends in Ireland also suffered persecution, as well

well as those in England, but when the act of toleration took place, they were relieved by law.

But though the friends have thus in a great measure been freed from persecution, yet it is said, that it is not wholly removed in Great Britain and Ireland, for they are still liable to suffer in the Exchequer, and in the Ecclesiastical Court, in consequence of their being required to help support the national ministry. But the Friends in America are free from that burthen, as the people at present are not bound to support such a ministry. It appears by history, that the Friends were often greatly persecuted, because it was against their consciences to kill their fellow mortals, and to take oaths before a magistrate, and that some of the priests have been very busy in carrying on those persecutions.

About the year 1682, Pennsylvania was sold by the Duke of York to the Penn family, and William Penn obtained a charter from the King for the settlement of that Government, into which many of the Friends were induced to remove. It soon became, and still continues to be, the largest settlement of Friends in America; but many settled in other provinces and colonies.

In 1737, whilst Jonathan Belcher, Esq. was Governor of the Massachusetts, an act of the Assembly was passed, which exempted the Friends in that province from contributing to the support of the public ministry; and they enjoyed a great

share of tranquillity in this and the other Governments, until the war commenced, which terminated in the separation of the United States from the dominion of Great-Britain.

During those commotions, they were involved in great trouble, by refusing to join in the military services which were required of them; many were imprisoned in divers Governments, and several suffered death at Philadelphia by reason of the war. Great numbers were reduced from circumstances of ease, if not of affluence, to the verge of want, by the excessive seizures which were frequently made of their property, to recover the fines imposed on them, for refusing to serve personally, or to substitute others, to join the continental armies.

I have extracted the greatest part of this short account from various authors, but principally from a pamphlet lately published in London. I have, however, added a few things that I knew myself, and several which I received from persons of good repute. Those who may be desirous of further information, are directed to read Sewell's History, Edmondson's Journal, and Rutt's History, concerning the persecutions the Friends have endured by reason of their religious sentiments.

DOCTRINE.

DOCTRINE.

The Friends believe in one eternal God, the Creator, and Preserver of the Universe: and in Jesus Christ, his Son, the Messiah, and Mediator of the New Covenant. Vid. Heb. xii. 24.

When they speak of the gracious display of the love of God to mankind, in the miraculous conception, birth, life, miracles, death, resurrection, and ascension of Christ, they prefer the use of such terms as they find in the Scriptures, and are contented with that knowledge which Divine wisdom hath seen meet to reveal; and though they do not attempt to explain those mysteries which remain under the VEIL; yet they acknowledge and assert the divinity of Christ, who is the wisdom and power of God unto salvation. Vid. 1 Cor. i. 24.

To Christ alone they give the title of the word of God. Vid. John i. 1. and not to the Scriptures, although they highly esteem those Sacred Writings, in subordination to the Spirit. 2 Pet. i. 21. from which they were given forth; and they hold with the Apostle Paul, that they are able to make wise unto salvation, through faith, which is in Christ Jesus. Vid. 2 Tim. iii. 15.

They reverence those most excellent precepts which are recorded in Scripture, and believe they were delivered by our Great Lord; that they are practicable, and binding on every Christian; and that

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DOCTRINE.

that in the life to come, every man will be rewarded according to his works. Vid. Matt. xvi. 27.

Of Universal and Saving Light.

That in order to enable mankind to put in practice those sacred precepts, many of which are contradictory to the unregenerate will of man, Vid. John i. 9, Every man coming into the world is endued with a measure of the light, and grace, or good spirit of Christ; by which he is enabled to distinguish good from evil, and to correct the disorderly passions and corrupt propensities of his nature, which mere reason is altogether insufficient to overcome. For all that belongs to man is fallible and within the reach of temptation; but this divine grace, which comes by him who hath overcome the world, John xvi. 33, is, to those who humbly and sincerely seek it, an all sufficient and present help in time of need. By this the snares of the enemy are detected, his allurements avoided, and deliverance is experienced though faith in its effectual operation, whereby the soul is translated out of the kingdom of darkness, and from under the power of Satan, into the marvellous light and kingdom of the son of God.

Of Worship.

The Friends being thus persuaded that man, without the spirit of Christ inwardly revealed, can do nothing to the glory of God, or to effect his own salvation, they think this influence especially necessary to the performance of the highest act of which the human mind is capable, even the worship of the Father of lights and of spirits, in spirit and in truth; therefore, they consider as obstructions to the pure worship, all forms which divert the attention of the mind from the secret influence of this unction from the Holy One. Vid. 1 John ii. 20, 22. Yet, although the true worship is not confined to time and place, they think it incumbent on Christians to meet often together, (vid. Heb. x. 25,) in testimony of their dependence on the Heavenly Father, and for a renewal of their spiritual strength; nevertheless, in the performance of worship, they dare not depend, for their acceptance with him, on a formal repetition of words and experiences of others; but they believe it to be their duty to cease from the activity of the imagination, and to wait in silence, to have a true sight of their condition bestowed upon them; believing even a single sigh, (vid. Rom. viii.) 26, arising from such a sense of their infirmities, and of the need they have of Divine help, to be more acceptable

to God, than any performances, however specious, which originated in the will of man.

Of the Ministry.

From the opinion the Friends are of concerning worship, it follows, that the ministry which they approve must have its origin from the same source; for that which is needful for a man's own direction, and for his acceptance with God, (vid. Jer. xxiii, 30, to 32,) must be eminently so to enable him to be helpful to others. Accordingly they believe the renewed assistance of the light and power of Christ, to be indispensably necessary for all true ministry; and that their holy influence is not at their command, or to be procured by study, but is the free gift of God to his chosen and devoted servants. From hence arises their testimony against preaching for hire, and in contradiction to Christ's positive command, "Freely ye have received, freely give." Vid. Matt. x. 8, And hence also arises their conscientious refusal of supporting such a ministry by tithes, &c.

Of the Preaching of Women.

As the Friends dare not encourage any ministry, but that which they believe to spring from the influence of the Holy Spirit, so neither dare they attempt to restrain this influence to persons of any condition

condition in life, or to the male sex alone ; but, as the male and female are one in Christ, they allow such of the female sex as they believe to be endued with a right qualification for the ministry, to exercise their gifts for the general edification of the church ; and this liberty they esteem to be a peculiar mark of the Gospel dispensation, as foretold by the Prophet Joel. Vid. Joel ii. 28, 29, and noticed by the Apostle Peter. Acts ii. 16, 17.

Of Baptism and the Supper.

There are two ceremonies in use amongst most professors of the Christian name, viz. water Baptism, and what is termed the Lord's Supper; the first of these being generally esteemed the essential means of an initiation into the church of Christ; and the latter of maintaining communion with him. But as the Friends have been convinced, that nothing short of his redeeming power, inwardly revealed, can set the soul free from the thralldom of sin, it is by this power alone that they believe salvation can be effected. And they hold that as there is one Lord and one Faith, (vid. Eph. iv. 5,) so Baptism is one in nature and operation; that nothing short of it can make us living members of his mystical body; and that the Baptism with water, administered by his forerunner John, belonged, as the latter confessed, to

an inferior and decreasing dispensation. Vid. John iii. 30.

With respect to the other rite, they believe that communion between Christ and his church is not maintained by that, nor any other external performance, but only by a real participation of his Divine nature through faith, vid. 2. Pet. i. 4; that this supper is alluded to in Revelation. Vid. Rev. iii. 20. "Behold I stand at the door and knock, "if any man hear my voice, and open the door, "I will come in to him, and will sup with him, "and he with me." And that where the substance is obtained, it is unnecessary to attend to the shadow, which doth not confer grace, concerning which different opinions and violent animosities have arisen amongst other professors of the Christian religion.

Of Universal Grace and Perfection.

As they thus believe that the grace of God, which comes by Jesus Christ, is alone sufficient for salvation, they can neither admit that it is conferred on a few only, whilst others are left without it; nor, thus asserting its universality, can they limit its operation to a partial cleansing of the soul from sin, even in this life. They entertain worthier notions both of the power and goodness of our Heavenly Father, and believe that he doth

doth vouchsafe to assist the obedient to experience a total surrender of the natural will to the guidance of his pure unerring spirit, through whose renewed assistance they are enabled to bring forth fruits unto holiness, and to stand perfect in their present rank. Vid. Matt. v. 48. Eph. iv. 13. Col. iv. 12.

Of Oaths and War.

There are not many of their tenets more generally known than their testimony against oaths and war. With respect to the former of these, they abide literally by Christ's positive injunction, delivered in his sermon on the Mount, viz. "Swear not at all." Vid. Matt. v. 34. From the same sacred collection of the most excellent precepts of moral and religious duty from the example of our Lord himself, (Matt. xxxix. 44, &c. Chap. xxvi. 52, 53. Luke xxii. 51. John xviii. 11.) and from the correspondent conviction of his spirit in their hearts, they are confirmed in the belief that wars and fightings are, in their origin and effects, utterly repugnant to the Gospel, which still breathes peace and good will to men. They are also clearly of the judgment, that if the benevolence of the Gospel was generally prevalent in the minds of men, it would effectually prevent them from oppressing, much more from enslaving, their brethren, (of whatsoever colour or complexion)

plexion) for whom as for themselves, Christ died; and would even influence their conduct in their treatment of the brute creation, which would no longer groan the victims of their avarice, and of their false ideas of pleasure.

Of Government.

Some of the tenets which the Friends professed, subjected their friends in former times to much suffering from Government, though as to the salutary purposes of Government, their principles are a security. They inculcate submission to the laws in all cases where in conscience is not violated; but they hold that as Christ's kingdom is not of this world, it is not the business of the Civil Magistrate to interfere in matters of religion, but to maintain the external peace and good order of the community. They therefore think persecution even in the smallest degree, unwarrantable. Hence they are careful in requiring their members not to be concerned in illicit trade, nor in any manner to defraud the revenue.

Of their Deportment.

Their society from their first appearance has disused those names of the months and days, which having been given in honour of the heroes or false gods of the Heathens, originated in their flattery and
and

and superstition; and the custom of speaking to a single person in the plural number, as having arisen also from motives of adulation. Compliments, superfluity of apparel and furniture, outward shews of rejoicing and mourning, and observation of days and times, they esteem to be incompatible with the simplicity and sincerity of a Christian life; and public diversions, gaming, and other vain amusements of the world, they cannot but condemn; they are a waste of that time which is given to us for nobler purposes, and divert the attention of the mind from the sober duties of life, and from the reproofs of instruction, by which we are guided to an everlasting inheritance.

Thus have I given a general description of the tenets which the Friends adhere to. They believe however that a true and living faith is not produced in the mind of man by his own effort, but that it is the free gift of God, (vid. Eph. ii. 8.) in Christ Jesus, nourished and increased by the progressive operation of the Holy Spirit in his heart, and his proportionate obedience. Vid. John vii. 17. Therefore, although, for the preservation of the testimonies given them to bear, and for the peace and good order of their society, they deem it necessary that those who are admitted into membership with them, should be previously convinced of those doctrines which are esteemed essential; but they require no formal subscription to any articles,

either as a condition of membership, or as a qualification for the service of their church.— They prefer the judging of men by their fruits, in a dependance on the aid of him who, by his Prophet, hath promised to be “a spirit of judgment to him that sitteth in judgment.” Vid. Isai. xxviii. 6; that without this, there is danger of receiving numbers into the outward communion, without any addition to the spiritual sheepfold, whereof Christ declared himself to be both the door and shepherd. Vid. John x. 7, 11. that is, such as know his voice, and follow him in the paths of obedience.

Of their Discipline.

Their discipline consists chiefly in relieving the poor, the maintenance of good order, the support of the testimonies which they believe is their duty to bear to the world, and the help and recovery of such as are overtaken in faults.

In the practice of their discipline, they think it is indispensibly necessary that the order recommended by Christ himself be invariably observed: Vid. Matt. xviii. 15, 17. “If thy brother shall trespass against thee, go and tell him his fault between thee and him alone: if he shall hear thee, thou hast gained thy brother; but if he will not hear thee, then take with thee one or two more, that in the mouth of two or three witnesses, every
“ word

“ word may be established ; and if he shall neglect
 “ to hear them, tell it unto the church.”

Of their Meetings for Discipline.

To effect the salutary purposes of discipline, meetings were appointed at an early period of the society, which from the times of their being held were called quarterly meetings. It was afterwards found expedient to divide the districts of those meetings, and to meet more often ; from hence arose their monthly meetings, subordinate to those held quarterly. At length, in 1669, a yearly meeting was established, to superintend, assist, and provide rules for the whole ; previous to which, generally meetings had been occasionally held.

Of their Monthly Meetings, Poor, convinced Persons, Certificates of Removal, Overseers, and Mode of dealing with Offenders.

A monthly meeting is commonly composed of several particular congregations, situated within a convenient distance of each other, and where this is the case, it is usual for the members of each congregation to form what is called a preparative meeting, because its business is to prepare whatever may occur among themselves to be laid before the monthly meeting. Their business at the monthly meeting is to provide for the subsistence of the poor, and for the education of their children ; to judge of the sincerity and fitness of persons

sons appearing to be convinced of the truth of the religious principles of the society, and desiring to be admitted into membership; to excite due attention to the discharge of religious and moral duties, and to deal with disorderly members.

When any have made application to become members of the society; a small committee is appointed to visit the party, and make a report to the monthly meeting; which is directed not to admit any into membership, without allowing a seasonable time to consider of their conduct.

At the monthly meetings the Friends also grant to such of their members as remove into other monthly meetings, certificates of their membership and conduct, without which they cannot gain membership in such meetings.

Each monthly meeting is required to appoint certain persons, under the name of *Overseers*, who are to take care that the rules of their discipline is put in practice; and when any account of disorderly conduct comes to their knowledge, they are to see that private admonition, agreeable to the Gospel rule before-mentioned, is given, previously to its being laid before the monthly meeting.

When a case is introduced, it is usual for a small committee to be appointed to visit the offender, in order to endeavour to convince him of his error, and induce him to forsake and condemn it if they succeed, the transgressor generally signs
a written

a written acknowledgment, and he is by a minute declared to have made satisfaction for the offence; if not, he is disowned as a member of the society. This is done by what is termed a testimony of denial, which is a paper reciting the offence, and sometimes the steps which have led to it; next, the means unavailingly used to reclaim the offender; after that, a clause disowning him; to which is usually added, an expression of desire for his repentance, and for his being restored to membership.

It has long been the decided judgment of the society that its members shall not sue each other at law; hence whence disputes arise between individuals, they are settled by arbitrators; and if any refuse to adopt this mode, or, having adopted it, to submit to the award, it is the direction at the yearly meeting, that such shall be disowned.

Of Marriages, Births and Burials.

The allowance of marriages also belongs to the Friends monthly meetings; for their society has always scrupled to acknowledge the exclusive authority of the priests in the solemnization of marriage. Those who intend to marry appear together, and propose their intention to the monthly meeting, and if not attended by their parents or guardians, produce a written certificate of their consent, signed in the presence of witnesses. The meeting

meeting then appoints a committee to inquire whether they are clear of other engagements respecting marriage; and if at a subsequent meeting, to which the parties also come and declare the continuance of their intention, and no objections are reported, they have the meeting's consent to solemnize their intended marriage. This is done in a public meeting for worship, towards the close whereof the parties stand up, and solemnly take each other for husband and wife. I was once present at one of their weddings, in America, where the man took the woman by her right hand, and uttered the following words before the meeting, as near as I can remember.

“ Friends, bear witness; I Thomas H——d, take this my friend, Nancy R——d, to be my kind and loving wife; and I promise, through the assistance of Divine Grace, to conduct towards her like a kind and loving husband, till by death we are separated.”

She then took him by the right hand, and cried, “ Friends, bear witness, I Nancy R——d, do take this my friend Thomas H——d, to be my kind and loving husband, and I promise, through the assistance of Divine Grace, to conduct towards him, like a kind and loving wife, till by death we are separated.”

A certificate of the proceedings was then publicly read by the clerk of the meeting, and signed by the parties, and afterwards by the relations, and others as witnesses. Of such certificates the monthly meeting keeps a record; as also of the births

births and burials of its members. A certificate of the date, of the name of an infant, and of its parents, signed by those present at the birth, is the subject of one of these last mentioned records; and an order for interment, countersigned by the grave-maker, of the other. The naming of children is without ceremony. Burials are also conducted in a simple manner. The body, followed by the relations and friends, is sometimes previous to interment carried to a meeting, and at the grave, a pause is generally made; on both which occasions it frequently falls out, that one or more of the Friends present have somewhat to express for the edification of those who attend: but no religious rite is considered as an essential of a burial.

Of Quarterly Meetings, Queries, and Appeals.

Several monthly meetings compose a quarterly meeting. At the latter are produced written answers from the monthly meetings, to certain queries concerning the conduct of their members, and the meeting's care over them. The accounts thus received, are digested into one, which is sent also in the form of answers to queries, by representatives, to the yearly meeting.—Appeals from the judgment of monthly meetings are brought to the quarterly meetings; whose business also it is to assist in any difficult case, or where remissness appears

appears in the care of the monthly meetings over the individuals who compose them.

Of Yearly Meetings.

The annual meeting has a general superintendance of the society in the country in which it is established; and therefore as the accounts which it receives discover the state of inferior meetings, as particular exigencies require, or as the meeting is impressed with a sense of duty, it gives forth its advice, makes such regulations as appear to be requisite, or excites to the observance of those already made; and sometimes appoints committees to visit those quarterly meetings which appear to be in need of immediate help. Appeals from the judgment of the quarterly meetings are here finally determined; and brotherly correspondence, by epistles, is maintained with other quarterly meetings.

According to an account I have lately received in London, there are seven yearly meetings, which are held at the following places, viz.

1. London.
2. New England.
3. New York.
4. New Jersey, and Pennsylvania.
5. Maryland.
6. Virginia.
7. The Carolinas, and Georgia.

Hence

Hence, according to this account, the four New England governments compose one meeting; New York another; New Jersey, and Pennsylvania another, &c.

The annual meeting is held at London, in the fifth month of this present year, 1791. To this meeting representatives come from Ireland, and from other parts of the world. Annual meetings have been held in almost every government of the United States of America, but as the times of their sitting are often altered, I shall not say any thing further on the subject.

Of Women's Meeting.

As the Friends believe that women may be rightly called to the work of the ministry, they also think, that to them belongs a share in the support of their Christian discipline; and that some parts of it, wherein their own sex is concerned, devolve on them with peculiar propriety. Accordingly they have monthly, quarterly, and yearly meetings of their own sex, held at the same time and in the same place with those of the men; but separately, and without the power of making rules: and it may be remarked, that during the persecutions, which in the last century occasioned the imprisonment of so many of the men, the care of the poor often fell on the women, and relief was by them satisfactorily administered.

Of

Of the Meeting of Ministers and Elders.

Those who believe themselves required to speak in the meetings for worship, are not immediately acknowledged as ministers by their monthly meetings; but time is taken for judgment, that the meeting may be satisfied of their call and qualifications. It will also sometimes happen, that such as are not approved, will obtrude themselves as ministers to the grief of their brethren; but much forbearance is used towards these, before the disapprobation of the meeting is publicly testified. But in order that those who are in the situation of approved ministers, may have the tender sympathy and counsel of either sex, who by their experience in the work of religion, are qualified for that service, the monthly meetings are advised to select such, under the denomination of elders. These, and ministers approved by their monthly meeting, have meetings peculiar to themselves, called meetings of ministers and elders, in which they have an opportunity of exciting each other to a discharge of their several duties; of extending their advice to those who may appear weak, without any needless exposure. These meetings are generally held in the compass of each month'y, quarterly, and yearly meeting. They are conducted by rules prescribed by the yearly meeting, and have no authority to make any

any alteration or addition to them. These members unite with their brethren in the meetings for discipline, and are accountable to the latter for their conduct.

Of the Second Day, Morning Meeting.

It is to a meeting of this kind held in London, that the revival of manuscripts intended for publication concerning their principles, is intrusted by the yearly meeting held in the same place, and also the granting, on the intervals of the yearly meeting, certificates of approbation to such ministers as are inclined to travel in the work of the ministry in foreign parts. When a visit of this kind does not extend beyond Great Britain, a certificate from the monthly meeting, of which the minister is a member is sufficient; if to Ireland, the concurrence of the quarterly meeting is also required. Regulations of a similar tendency obtain in other yearly meetings.

Meetings for Sufferings.

The yearly meeting held in London, in the year 1675, appointed a meeting to be held in that city, for the purpose of advising and assisting, in cases of suffering for conscience sake, which hath continued with great use to the society to this day. It is composed of Friends, under the name of cor-

M m respondents,

respondents, chosen by the several quarterly meetings, and who reside in, or near the city. The same meetings also appoint members of their own in the country as correspondents, who are to join their brethren in London on emergency. The names of some of the correspondents, previous to their being recorded as such, are submitted to the approbation of the yearly meeting. Those of the men, who are approved ministers, are also members of this meeting, which is called the meeting for sufferings; a name arising from its original purpose, which is not yet become entirely obsolete.

The yearly meeting has intrusted the meeting for sufferings with the care of printing and the distribution of books, and with the management of its stock, which is collected by an occasional voluntary contribution, and expended in printing books, house-rent for a clerk, and his wages for keeping records, the passage of ministers who visit their brethren beyond the sea, and some small incidental charges.

The Committee that has the care of this stock, &c. is considered as a standing Committee for the yearly meeting; and hath a general care of whatever may arise, during the intervals of that meeting, which affect the society, and require immediate attention; particularly of those circumstances which may occasion an application to government.

There is not any President in any of their meetings, as they believe that Divine wisdom alone ought to preside; nor has any member a right to claim pre-eminence over the rest. The office of Clerk, with a few exceptions, is undertaken voluntarily by some member, as is also the keeping of records. Where these are very voluminous, and require a house for their deposit, (as is the case in London, where the general records of the society in Great Britain are kept) a clerk is hired to have the care of them; but except a few clerks of this kind, and persons who have had the care of meeting houses, none receive any stipend or gratuity for their services in a religious society.

Conclusion.

Thus have I given a short account of the rise, sufferings, doctrines, and discipline of the Friends, the greatest part of which I have extracted from their own publications. They are a very civil, industrious, and honest people; and as they do not harass one another with law suits, are very temperate, avoid superfluities, and those vanities and follies, which are too much followed by many others who are called Christians, they commonly grow rich, or, at least, get a comfortable subsistence. They are hospitable to strangers, kind to the poor, promoters of brotherly love, and of the

public tranquillity; and they augment the national revenue, as they pay their taxes, and refuse to run goods, or to buy any that have been run. Would not the world be almost a *paradise*, if all the people would follow the example of the Friends, in walking *honestly*, and in living *peaceably*?

C H A P. LI.

An Account of the Moravians.

THE Moravians are a sect of Protestants called *Unitas Fratrum*; or the United Brethren. They appeared in Bohemia, in the year 1457; and have been settled a long time at Hernhuth, in Germany. In 1737, there were some in England, but of late years they have spread themselves over many parts of America. They possess the utmost veneration for our Blessed Saviour, whom they consider as their immediate head and director; they also enjoin the most implicit obedience to the rules of their church, and are said to practise much brotherly love amongst one another. The substance of the constitution of their church, dated in the year 1733, at Hernhuth, in Upper Saxony, in Germany, is as follows, viz.

1. They have a *Senior*, or *Eldest*, who is to assist the church by his counsel and prayers, and to determine what shall be done in matters of importance. Of him is required, that he be well experienced in the things of God, and witnessed by all for holiness of conversation.

2. They have *Deacons*, or *Helpers*, who are in private assemblies to instruct : To take care that outward things are done decently and in order : and to see that every member of the church grows in grace, and walks suitable to his holy calling.

3. The *Pastor*, or *Teacher*, is to be an overseer of the whole flock, and every person therein ; to baptize the children ; diligently to form their minds, and bring them up *in the nurture and admonition of the Lord* : When he finds in them a sincere love of the cross, then to receive them into the church : to administer the supper of the Lord : To join in marriage those who are already married to Christ : To reprove, admonish, quicken, and comfort, as need requires : To declare the whole counsel of God : Taking heed at all times to speak as the oracles of God, and agreeably to the analogy of faith : To bury those who have died in the Lord, and to keep that safe which is committed to his charge, even the pure doctrine and apostolical discipline which they have received from their forefathers.

4. They have also another sort of *Deacons* who take care that nothing be wanting to the *orphan-house*, to the poor, the sick, and the strangers. Others again there are, who are peculiarly to take care of the sick ; and others, of the poor. And two of these are intrusted with the public stock, and keep accounts of all that is received or expended.

5. There

5. There are women who perform each of the above-mentioned offices, among those of their own sex: For none of the men converse with them, beside the eldest, the teacher, and one, or sometimes two of the Deacons.

6. Towards magistrates, whether of a superior or inferior rank, they bear the greatest reverence, and cheerfully submit to their laws; and even when many of them have been spoiled of their goods, driven out of their houses, and every way oppressed by them, yet they resisted them not, neither opened their mouths, nor lifted up a hand against them. In all things which do not immediately concern the inward spiritual kingdom of Christ, they simply, and without contradicting, obey the higher powers. But with regard to conscience, the liberty of this they cannot suffer to be any way limited or infringed. And to this head they refer whatever directly and in itself tends to hinder the salvation of souls: Or, whatsoever things Christ and his holy apostles (who meddled not with outward worldly things) took charge of, and performed, as necessary for the constituting and well-ordering of his church. In these things they acknowledge no head but Christ; and are determined, God being their helper, to give up not only their goods but life itself, rather than the liberty which God hath given them.

7. As it behoves Christians not to be *slithful in business*, but diligently to attend to the works of

their calling, there are persons chosen by the church, to superintend all those who are employed in outward business. And by this means also, many things are prevented which might otherwise be an occasion of offence.

8. They have also *Censors* and *Monitors*; of those experience and perspicacity, wisdom and modesty are chiefly required. The *Censors* signify what they observe (and they observe the smallest things) either to the *Deacons* or *Monitors*. Some *Monitors* there are, whom all know to be such; others who are secretly appointed; and who, if need require may freely admonish in the love of Christ, even the rulers of the church.

9. The church is so divided, that first the husbands, then the wives, then the widows, then the maids, then the young men, then the boys, then the girls, and lastly the little children, are in so many distinct classes: each of which is daily visited, the married men by a married man, the wives by a wife, and so of the rest.* The larger are also divided into smaller classes, or bands, over each of which one presides who is of the greatest experience. All these leaders meet the senior every week, and lay open to him and to the Lord, whatsoever hinders or furthers the work of God, in the souls committed to their charge.

* This work all the married brethren and sisters, as well as all the unmarried, perform in their turns.

10. In the year 1727, four and twenty men and as many women agreed, that each of them would spend an hour in every day, in praying to God for his blessing on his people; and for this purpose both the men and women chose a place, where any of their own sex who were in distress, might be present with them. The same number of unmarried women, of unmarried men, of boys, and of girls, were afterwards, at their desire, added to them, who pour out their souls before God, not only for their own brethren, but also for other churches and persons, that have desired to be mentioned in their prayers. And this perpetual intercession has never ceased, day or night, since its first beginning.

11. And as the members of the church are divided, according to their respective states and sexes: so they are also, with regard to their proficiency in the knowledge of God. Some are dead, some are quickened by the spirit of God: Of these, some again are untractable, some diligent, some zealous, burning with their first love; some babes, and some young men. Those who are still dead, are visited every day. And of the babes in Christ especial care is taken also, that they may be daily inspected and assisted to grow in grace, and in the knowledge of our Lord Jesus.

12. In the *orphan-house*, a number of children are brought up, separate according to their sex. Beside which, several experienced persons, appointed

pointed to consult with the parents, touching the education of the other children. In teaching them Christianity, they make use of Luther's Catechism, and study the amending of their wills as well as their understanding; finding by experience, that when their will is moved, they often learn more in a few hours, than otherwise in many months. Their little children they instruct chiefly by hymns; whereby they find the most important truths most successfully insinuated into their minds.

13. They highly reverence marriage, as greatly conducive to the kingdom of Christ. But neither their young men nor women enter into it till they assuredly know, they are married to Christ. When any know it is the will of God, that they should change their state, both the man and woman are placed for a time, with some married persons, who instruct them how to behave, so that their married life may be pleasing to God. Then their designs are laid before the whole church, and after about fourteen days, they are solemnly joined, tho' not otherwise habited, than they are at other times. If they make any entertainment (which is not always) they invite only a few intimate friends, by whose faithful admonitions they may be the better prepared to bear their cross, and fight the good fight of faith. If any woman is with child, mention is made of her condition in the public prayers, and she is also exhorted in private, wholly to give herself up into the hands of her faithful

faithful Creator. As soon as a child is born, prayer is made for it, and if it may be, it is baptised in the presence of the whole church. Before it is weaned, it is brought into the assembly on the Lord's Day.

14. Whoever either of the male or female children seek God with their whole heart, know their sins are forgiven, and obey the truth, are not used to be much incited to come to the Lord's supper; neither are they forbidden so to do, if they desire it. They think it enough to teach their children just conceptions of it, and the difference between this food of the soul, and that milk which they every day receive of Christ. They then publicly declare the sentiments of their hearts concerning it. They are afterwards examined both in private by the pastor, and also in public: And then after an exhortation by the *Senior*, are by him, thro' laying on of hands, added to the church and *confirmed*. The same method is used with those who renounce the Papal superstitions, or who are turned from the service of Satan to God; and that, if they desire it, altho' they are not young; yea, though they are well stricken in years.

15. Once or twice in a month all the church receives the Lord's Supper, and the power of God being present amongst them, a general confession of sins is made by one of the brethren in the name of all. Then a few solid questions are asked; which when they have answered, the absolution

lution or remission of sins is either pronounced to all in general, or confirmed to every particular person, by the laying on of hands. The Seniors first receive; then the rest in order, without any regard had to worldly dignity, in this, any more than in any other of the solemn offices of religion. After receiving, all the men (and so the women) meet together, to renew their covenant with God, to seek his face, and to exhort one another to the patience of hope and the labour of love.

16. They have a peculiar esteem for lots, and accordingly use them both in public and private, to decide points of importance, when the reasons brought, on each side appear to be of equal weight. And they believe this to be then the only way of wholly setting aside their own will, of acquitting themselves of all blame, and clearly knowing what is the will of God.

17. At eight in the morning, and in the evening, they meet to pray and to praise God, and to read and hear the Holy Scriptures: The time they usually spend in sleep, is from eleven at night till four in the morning. So that allowing three hours in a day for taking the food both of their bodies and souls, there remains sixteen for work. And this space those who are in health spend with all diligence and faithfulness.

18. Two men keep watch every night in the streets, as do two women, in the women's apartment: They may pour out their souls for those
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that sleep; and by their hymns raise the hearts of any who are awake to God.

19. For the further stirring up of the gift which is in them, sometimes they have public, and sometimes private Love-feasts: At which they take a moderate refreshment, with gladness and singleness of heart, and the voice of praise and thanksgiving.

20. If any man amongst them having been often admonished, and long forborn, persists in walking unworthy of his holy calling, he is no longer admitted to the Lord's Supper. If he still continues in his fault, hating to be reformed, the last step is, publicly, and often in the midst of many prayers and tears, to cast him out of their congregation. But great is their joy, if he then sees the error of his ways, so that they may receive him amongst them again.

21. Most of their brethren and sisters have, in some part of their life, experienced holy mourning and sorrow of heart; and have afterwards been assured, that *there was no more condemnation for them, being passed from death unto life.* They are therefore far from fearing to die, or desiring to live on earth; knowing that to them *to die is gain*, and being confident that they are the care of him, whose are the *issues of life and death.* Wherefore they depart as out of one chamber into another, and after the soul has left its habitation, the remains are deposited in the earth, appointed for
that

that purpose, and the survivors are greatly comforted, and rejoice over them, with a *joy the world knoweth not of.*

It appears from history, that the Moravians suffered a most horrible persecution in Moravia and Bohemia, about the year 1458: for the King having promised by his coronation oath, to extirpate the Heretics, was under a necessity to persecute the United Brethren: Hence they were declared unworthy of the common rights of subjects, and in the depth of Winter, turned out of the cities and villages, with the forfeiture of all their effects. The sick were cast out in the open fields, where many perished with hunger and cold; and having been accused by the Romish priests, and some others, of being secret fowers of sedition, many were thrown into prisons, with a view of extorting from them by hunger, cold, racks, and other tortures, a confession of having been guilty of seditious designs; but as they were innocent, nothing could be extorted from them that way. Hence numbers were inhumanly dragged at the tails of horses, or carts, and quartered, or burnt alive. Many died in the prisons, and such as survived were, at last, when no crime could be proved against them, discharged in a most pitiful condition.

It also appears, that the various persecutions that these people met with from time to time, was the cause of their emigrating from their own country,

country, and settling in different parts of the world.

Thus have I related the substance of their constitution as it stood in 1733; and whether they have added any thing to it, or diminished any thing from it since that time, I have not learnt. I was once at their meeting in London, where they read the service and made use of both vocal and instrumental music, but their prayers are different from those of the church of England.

C H A P. LII.

An account of the METHODISTS.

METHODISM took its rise in 1734; the Rev. George Whitfield, B. A. a Divine of the Church of England, who was born, 1714, and died 1770, and the Rev. John Wesley, M. A. a minister of the same church, who was born 1703, and died, 1791, are said to be the founders of this institution. But Mr. Whitefield's followers and Mr. Wesley's disagree in sentiment, in that the former believe that salvation is obtained by faith alone in Christ Jesus, and that the love of God to his elect cannot be broken off; the latter believe that men are justified by works and grace, and that it is possible for them to go on in degrees of holiness, till they arrive at last even to a state of perfection in this life. Mr. Wesley's converts are so very numerous, that one of his preachers informed me there are about 70,000 in Great Britain, and Ireland; and, according to a publication which I have lately seen, there are upwards of 43,000 in America. Some of Mr. Whitefield's

field's followers are said to be rigid observers of the 39 articles of the Church of England, whilst others call themselves Calvinists.

The places appointed for assembling together are called Tabernacles by Mr. Whitefield's people, and preaching houses by Mr. Wesley's adherents. Both sometimes pray according to the forms in the Common Prayer book, and sometimes extempore. They are very serious in their devotions, observe the Eucharist, water baptism, and a love feast, the latter being only bread and water. When people enter into their church, they confess their sins, tell what experiences they have had of the new birth, own a covenant, and receive a ticket, denoting that they belong to the Methodistical society, and are entitled to all the privileges of the same. These tickets are exchanged once in six months for new ones. But if any brother or sister has walked disorderly, they are excommunicated, by being debarred from the benefit of receiving a new ticket, unless repentance and reformation takes place.

Many of those people within the circle of my acquaintance have pretended to very remarkable convictions and conversions; that their minds have been instantaneously illuminated by the rays of Divine grace; that they have thus been turned from darkness to light, and enabled to walk in newness of life; and some have pretended that they have seen visions, &c. These things have been imput-

ed to the powers of imagination only by some people, and others have imputed them to a supernatural power, but let them be as they may, I have seen a visible change in some who have pretended they have been thus converted; as they have appeared to be more honest in their dealings and more exemplary in their lives and conversations than they were before.

Mr. Whitefield travelled through and preached in many parts of America; and Mr. Wesley, was about a year and nine months in Georgia and South Carolina: he also travelled and preached in Great Britain and Ireland, and has been several times in Holland and Germany. Mr. Whitefield was also a great traveller and preacher in England; and both of these Ministers often preached in the fields, to ten, fifteen and sometimes to twenty thousand people.

It appears that these preachers have done much good, by uniting the people, and by promoting brotherly love, acts of kindness, charity and humanity amongst mankind; for their followers are very kind to the poor, to strangers, &c. as I have found by my own experience and observations.

Mr. Whitefield, died in New-England, in America, in the year 1770, and Mr. Wesley at London, March the 2d, 1791.

I shall conclude this chapter by adding the following, which I composed and published just after his death, viz.

An

A N E L E G Y

On the Death of the late Reverend JOHN WESLEY, A. M.

GREAT *Wesley's* gone, he's landed on the shore,
 Where grief and trouble shall afflict no more;
 A pious life he liv'd upon the stage,
 Until he was nigh eighty-eight of age.
 In Lincolnshire it truly has been found
 This man was born, upon Great-Britain's ground.
 When he was young, it often has been said,
 His father's house was all in ashes laid:
 The room in flames! behold, the child did wake,
 Sprang to the window, which he up did take;
 There, all alone, he loudly rais'd his cry
 Unto some neighbours, that were drawing nigh
 To him they ran, on hearing the loud call,
 And took him out just as the house did fall:
 Thus they the *lad* from *burning flames* did *pluck*,
 And thank'd the *Lord* that they had such good *luck*.
 His mind on learning very much was bent,
 Hence to a college he in time was sent;
 Studies profound the *pupil* follow'd till
 He was a man of scientific skill.
 As time roll'd on, with pleasure and with ease,
 He did receive the requisite degrees;
 After his learning he had thus obtain'd,
 To preach the word, he truly was ordain'd:
 From place to place, as godly teachers shou'd,
 He often went, and daily did do good.

I understand that he, in former times,
Did cross the ocean to the Western climes :
He preached at Georgia, as some people say,
But left the place, and came again this way.
Has spent much time upon Old England's ground,
In writing books, and preaching all around.
Sometimes he landed on the Irish shore,
And many people preached the word before :
To Scotland too he frequently did go,
And twice to Holland, with his friends also ;
A famous man he was to preach and pray,
When he was old, and in his younger day.
Both great and good, we truly may relate ;
Exceeding useful both in church and state ;
Kind to the poor ; he often gave relief
To men and women overwhelmed with grief ;
Who taught the people always to suppress
Those things, indeed, which lead to wickedness.
He loyal was, impress'd the blessed thing
Of fearing God, and honouring the King ;
Exhorted men to let contention cease,
To live in love, in harmony, and peace.
But he's been struck a *fatal stroke* by death ;
His body *fell*, and off did fly his *breath*.
The sprightly *actions*, which he once possess'd,
Are wholly gone, and all is still at *rest* :
Can't see, nor hear, nor any way converse,
Nor move one finger in the universe.
This is the *fate*, I plainly do relate,
Of ev'ry creature in this mortal *state* !

The high, the low, the rich, the poor, the small,
 By the great *King* of *Terrors* down must fall.
 Though some live long when they pass through
 this world,

Yet some by death soon from the stage are hurl'd :
 The tender infants in their lovely bloom
 Are often hurried to the silent tomb.
 Adults grown up, nay, some of ev'ry age,
 By cruel Death are taken from the stage.

When *Wesley* died, his spirit then did fly
 To him that rais'd the arches of the sky ;
 To realms above, where Saints and Angels sing,
 Loud Hallelujahs to their Heav'nly King.
 Thus whilst his body stays behind at rest,
 His pious soul with happiness is blest.

O, happy state, in which this man is cast !
 His pains are gone, and all his trouble's past !
 Needs no physician to give him relief,
 Is free from pain, from sorrow, and from grief ;
 And from the rage of all the sons of strife,
 And the vexations of a mortal life.
 The sland'ring tongue, and the backbiting knave
 Can't hurt him now, he's in the silent grave :
 Neither the thief that robs both night and day,
 Nor any murd'rer who kills on the way ;
 By no means can the tyrant him oppress,
 Nor wicked mortals lead him to distress.

When roaring winds bring up the thicken'd
 cloud,

When the grum thunder rumbles out aloud,

When the earth quakes, when lofty mountains fall,
When cities sink, and can't be found at all ;
When inundations o'er the land arise ;
When burning mountains burst towards the skies :
When famine and the pestilence doth rage ;
When wicked nations in a war engage ;
When blood and carnage greatly do expand,
When desolation overspreads the land ;
And boist'rous tempests rage upon the sea,
Great Wesley then from danger must be free :
Can't be afraid of being hurt or slain,
Like wretched mortals who alive remain.
Let not his *bearers* then at death repine ;
Since it was made by God an *act divine*,
To raise the *Just*, the *Husband*, *Child*, and *Wife*,
From scenes of trouble to a better *life*.

But let them all whilst in the present state,
His good *example* mind to *imitate* ;
That when they *die*, like *him*, they may be *blest*
With *glory*, *honour*, *happiness*, and *rest*.

London, March 7, 1791.

C H A P. LIII.

An Account of the Swedenborhgers, called the New Church.

THE Hon. Emanuel Swedenborg, son of Jasper Swedborg, a Swedish Bishop, was born at Stockholm, in Upland, in Sweden, January 29, 1688, is said to be the founder of this New Church. He was related to some illustrious families in that kingdom, and when young, made a great progress in the mathematics, natural history, physic, chymistry, anatomy, &c. which soon recommended him to the patronage of Charles XII. who made him Extraordinary Assessor to the Royal College of the Mines, which office he quitted, that he might apply himself to the new function to which he had been called: but he retained his salary, though he declined accepting a place of higher dignity in the State, lest it should be a snare to him.

He was ennobled by Queen Ulrica Eleonora, and named Swedenborg (his name before was

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Swedborg) and took a seat with the Nobles of the Equestrian Order, in the triennial assemblies of the States, and was chosen a Fellow of the Royal Academy of Sciences at Stockholm.

He pretended that he belonged to a society of angels, in which things spiritual and heavenly were the only subjects of discourse and entertainment; that he conversed frequently with them, and the souls of those who had departed this life, and that he had a call to teach the doctrines of the *New Church*. That in 1743, the Lord appeared to him personally, and opened in him a sight of the spiritual world, and enabled him to converse with spirits and angels.

He published a number of books in the Latin language, containing an account of the things he had seen, and those revealed, concerning Heaven and Hell; the state of men after death, the worship of God, the spiritual sense of the Scriptures, and many other important truths, tending to salvation and true wisdom.

After he had made eight voyages to England, he settled in the study of theology, was much esteemed by the bishops and nobles of his own country, and corresponded with many distinguished characters in various parts of Europe; he died at the house where he resided when in London, in Cold-bath-street, Cold-bath-Fields, March 29, 1772, aged 84 years. Some of his works have been translated and printed in English.

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The principles and doctrines of his followers, as communicated to me by a *Divine* of the Church of England, as are follow :

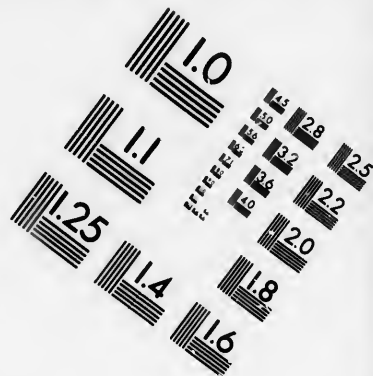
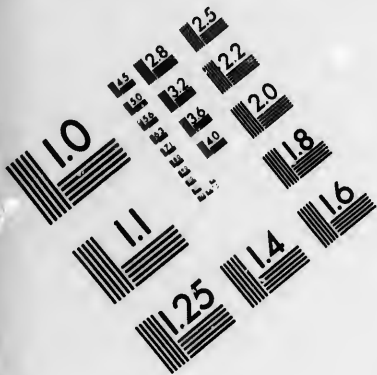
1. That there is a Divine Trinity in the person of Jesus Christ, consisting of Father, Son, and Holy Ghost, just like the human trinity in every individual man, of soul, body, and operation; and that as the latter trinity constitutes one man, so the former trinity constitutes one Jehovah God, who is at once the Creator, Redeemer, and Regenerator.

2. That Jehovah God himself came down from Heaven, and assumed human nature for the purpose of removing Hell from man, of restoring the Heavens to order, and of preparing the way for a *New Church* upon earth; and that herein consists the true nature of redemption, which was effected solely by the omnipotence of the Lord's divine humanity.

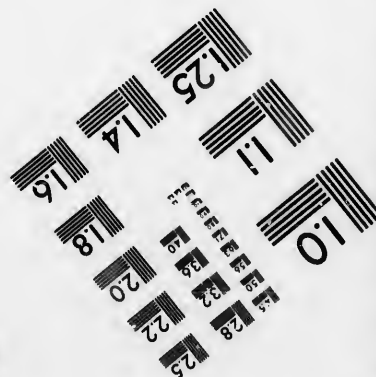
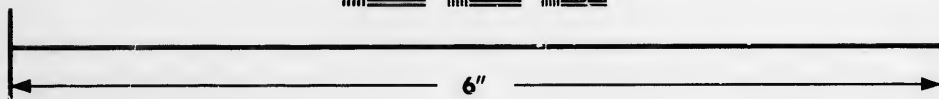
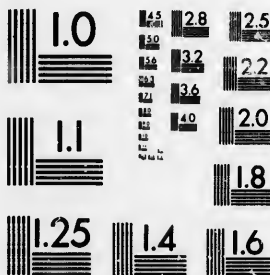
3. That the notion of obtaining pardon by a vicarious sacrifice, or atonement, is a fundamental and fatal error. But that repentance is the foundation of the *Church* in man, and consists in his abstaining from all evils, because they are sins against God, &c. That it is productive of regeneration, which is not an instantaneous, but a gradual work, effected by the Lord alone, through charity and faith, during man's co-operation.

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4. That man has free-will in spiritual things, whereby he may join himself by reciprocation with the Lord.

5. That the imputation of the merits and righteousness of Christ is a thing as absurd and impossible, as it would be to impute to any man the work of creation; for the merits and righteousness of Christ consist in redemption, which is as much the work of a Divine and Omnipotent Being as creation itself. That the imputation which really takes place, is an imputation of good and evil, and that this is according to a man's life.

6. That the doctrine of predestination and justification by faith alone, is a mere human invention, and not to be found in the word of God.

7. That the two Sacraments of Baptism and the Holy Supper are essential institutions in the *New Church*, the genuine and rational uses of which are now discovered, together with the spiritual sense of the Holy Word.

8. That there is not a single genuine truth remaining in the *Old Church* but what is falsified, and therefore the *Old* and the *New Church* cannot possibly be reconciled together.

9. That the Holy Word, or Sacred Scripture, contains a threefold sense; namely, celestial, spiritual, and natural, which are united by correspondencies; and that in each sense it is Divine truth, accommodated respectively to the angels of the three Heavens, and also to men on earth.

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10. That the books of the word (or Scriptures) are those which have the internal sense, and are the five books of Moses, and those of Joshua, Judges, Samuel, Kings, the Psalms, and all the Prophets; also, the four Evangelists, and the Revelation; and that the books of Ruth, Chronicles, Ezra, Nehemiah, Esther, Job, Proverbs, Ecclesiastes, Song of Solomon, the Acts and Epistles of the Apostles, not having the internal sense, are not the word, or Divine Revelation.

11. That in the spiritual world there is a Sun distinct from that of the natural world, the essence of which is the pure love of Jehovah God, who is in the midst thereof; that the heat also proceeding from that of that Sun is in its essence love, and the light thence proceeding is in its essence wisdom; and by the instrumentality of that Sun all things were created, and continue to subsist, both in the spiritual and in the natural world.

12. That there is not in the universal Heaven, a single angel that was created so at first, nor a single devil in the infernal regions, that ever was created an angel of light, and was afterwards cast out of Heaven; but that all, both in Heaven and Hell, are of the human race; that those in Heaven are such as had lived in heavenly love and faith in this world; and those in Hell are such as had lived in hellish love and faith on earth.

13. That

13. That the material body never rises again; but that man, immediately on his departure from this life, rises again, as to his spiritual and substantial body, (which was inclosed in his material body, and formed from his predominant love, whether it be good or evil) wherein he continues to live as a man, in a perfect human form, in all respects as before, save only the gross material body, which he puts off by death, and which is of no further use.

14. That the state and condition of man after death is according to his past life in this world; and that the predominant love which he takes with him into the spiritual world, continues with him for ever, and can never be changed to all eternity; and; consequently, if it be good, he abides in Heaven to all eternity; but if evil, he abides in Hell to all eternity.

15. That true conjugal love, which can only subsist between one husband and one wife, is a primary characteristic of the *New Church*, being grounded in the marriage of goodness and truth, and corresponding with the marriage of the Lord and his *Church*; and therefore it is more celestial, spiritual, holy, pure, and clean, than any other love in angels, or men.

16. That the science of correspondencies (which has been lost for some thousands of years, but is now revived in the theological works of the Hon. Emanuel Swedenborg) is the only key to
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the spiritual and internal sense of the Holy Word, every page of which is written by correspondencies, that is, by such things, in the natural world, as correspond unto, and signify things in the spiritual world.

17. That all those passages in the Scripture, generally supposed to signify the destruction of the world by fire, &c. commonly called the last judgment, must be understood, according to the above science, which teaches, that by the end of the world, or consummation of the age, is not signified the destruction of the world, but the destruction or end of the present Christian Church, both among Roman Catholics and Protestants of every description; and that this last judgment actually took place in the spiritual world in the year 1757.

18. That the second Advent of the Lord, which is a coming not in person, but in the spiritual or internal sense of his Holy Word, has already commenced; that it is effected by means of his servant Emanuel Swedenborg, before whom he hath manifested himself in person, and whom he hath filled with his spirit, to teach the doctrines of the *New Church* by the word from him; and that this is what is meant in the Revelation by the New Heaven and the New Earth, and the New Jerusalem thence descending.

These people hold to the *Doctrine* or *Science* of *Correspondencies*, which Mr. Swedenborg sets forth

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to be the most exalted of all sciences, and as the fountain from whence the ancients derived all their understanding and wisdom, being the only key whereby the Holy Scriptures can be properly understood.

This science consists in a correspondence between the natural and spiritual world, and seems to include every thing that hath an existence, because this globe, with all its furniture, exists and subsists from the spiritual world, and both from the Almighty; and were the correspondence to cease, every thing in the natural world would perish and be annihilated. For further information concerning this science, I refer the Reader to Mr. Swedenborg's publications. A considerable number of people have embraced these principles in England; there is a society in London, and one in Birmingham; and I understand that a Society has lately sprung up in New-York, and another in Virginia, in America.

Such are the general outlines of the doctrines of the *New Church*, which I have taken some pains to collect from the best authority, and on the merits of which I shall leave to the judgment of my Readers to decide.

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C H A P. LIV.

*Of the MOSAIC, EVANGELIC, and CIVIL LAWS.
What Punishments have been ordered to be inflicted
on Criminals.*

THE Mosaical laws are those contained in the five books of Moses, viz. Genesis, Exodus, Leviticus, Numbers, and Deuteronomy; they were given by the Almighty to Moses, and were by him communicated to the children of Israel.

Those guilty of idolatry, blasphemy, murder, adultery, sodomy, bestiality, rape, man-stealing, house-breaking, cursing or smiting of parents, witchcraft, &c. were to suffer death. Those who were guilty of fornication were to pay a fine; and those who had stolen any thing were to restore four-fold. Those who perjured themselves were to be punished with death, if the judges thought they deserved it, but the punishment by scourging was not to exceed forty stripes.

The Evangelical laws are those contained in the Gospels of Matthew, Mark, Luke, and John; and also in the Writings and Epistles of the Apostles, who were sent by Christ to preach the glad tidings of peace and salvation to the inhabitants
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of the world; and, in a word, these laws contain a complete system of the principles and doctrines of the Christian Religion.

No punishments are ordered to be inflicted under the Gospel dispensation, only an excommunication from the church. Hence it is said, if any man love not the Lord Jesus Christ, let him be *Anathema Maran-atba*. (Vid. 1 Cor. xvi. 22.) But the workers of iniquity who die in their sins, are to be punished in the world to come. Hence, indignation and wrath, tribulation and anguish, upon every soul of man that doth evil, &c. Vid. Rom. ii. 8, 9.

The civil laws are those composed out of the best of the Roman and Grecian laws. They were observed throughout the Roman dominions for more than twelve hundred years. They are also those laws which have been made by other legislators, for the government of empires, kingdoms, states, provinces, counties, and cities.

Different kinds of punishments have been ordered to be inflicted on criminals in different kingdoms and countries.

In Great Britain it is death, by the laws, to commit murder, highway robbery, theft, burglary, forgery, to coin money, become a traitor, commit a rape, sodomy, &c. Those found guilty of blasphemy are to have their tongues bored through with a hot iron, and various fines are imposed for offences less capital. Not more than
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forty stripes can be put upon a criminal for one offence according to the Civil law.

The Martial laws are very severe, not less than a thousand stripes may be inflicted on a criminal in an army at one time, if the officers see fit, as I have been informed; but only forty can be inflicted in a navy. It is death to desert from an army, and I believe it is sometimes to desert from a fleet.

Various punishments have been inflicted among different nations, such as fines, imprisonments, confiscation of property, banishment, scourging, standing in the pillory, cutting off of the ears, lying in the stocks, burning, hanging, drawing in quarters, racking on a wheel, cutting to pieces by inches, sawing asunder, drowning, the dashing of criminals to atoms by throwing them down from high places upon rocks, stoning to death, &c. and many have lost their lives by hunger, cold and nakedness, in dungeons, and prisons, and by being driven from their habitations into the open fields. Some have supposed that no punishments ought to be inflicted but such as are mentioned in the law of Moses.

I have often thought that children ought to be taught the laws of their country when they are young, as well as the Mosaical and Evangelical laws, for it might tend to deter them from committing crimes they may commit, if they are trained up in ignorance.

C H A P. LV.

Of the Laws of Nature, Motion, and Rest. Attraction, Repulsion, and Compression. The Velocity of the Rays of Light, and different Colours in the Universe. The Cause of Sound, and the Rapidity of its Motion.

THE laws of Nature are those by which natural bodies are governed in all their actions upon one another.

Laws of motion are a continual and successive mutation of place, or a moving from one place to another.

Laws of rest are those which cause bodies to remain in their different positions without motion.

Attraction is a drawing unto, or the tendency which bodies have towards one another.

Repulsion is a beating or driving back, and where attraction ends repulsion begins. But there are no bodies which repel only at certain distances. Hence a loadstone will not repel a needle only at a certain distance.

Compression is a squeezing or pressing together, by the weight of the atmosphere, or any other thing.

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There are certain laws by which the motions of all natural bodies are constantly governed, and rules by which every thing relating to motion may be explained.

Sir Isaac Newton described three kinds of the laws of Nature, viz.

1. That all bodies continue in their state of rest, or motion, uniformly in a right line, excepting they are obliged to change that state by forces impressed.

Hence all bodies are incapable of moving themselves, and, unless moved by some external or agent, must remain at rest.

They will therefore lie still, unless it is moved by an outward or an inward force. The former may be produced various ways, and the latter by an explosion of gun-powder, after the powder has been put into its center, by means of a drill, &c. and other bodies may be moved in like manner, or from some other cause.

When a rock is put in motion, it will continue to move in a right-lined direction, until the resistance of the air, the power of its own gravity, or some other external cause, turns it from that direction, diminishes its velocity, and brings it at last to a state of rest.

But the regions through which the planets and comets move make but a small resistance to their bodies, which are vastly large: hence their motions are continued the longer. If it was other-

wife, they would soon fall into the Sun, and be at rest.

2. That all change of motion is proportional to the power of the generating force, and is always made according to a right line in which that force is impressed. Hence, if we strike a musket-ball in a horizontal direction, with hammer, or any other thing, it will fly off with a velocity in proportion to the violence of the blow, and in the same direction; hence also there can be no perpetual motion, because all motion produced by any means is always in proportion to the generation force.

3. That repulsion, or re-action, is always equal, and in a contrary direction, to impulse, or action, that is, the actions of two bodies upon each other, are always equal, and in contrary directions.

Hence if we press a stone with our fingers downward, the stone equally presses them again upwards. An anvil strikes a hammer with the same force that the hammer strikes the anvil. If a mill-stone should be cast from the top of a steeple to the ground, the ground would strike the stone with the same velocity that the stone would strike the earth. If a horse draws a cart, the cart draws the horse with the same force, for the harness is equally distended both ways. When a boat is pulled to the shore by a rope, the shore pulls the boat as much as the boatsman pulls the shore, &c. &c.

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Of the Effects of Non-elastic Bodies striking each other.

1. If one body strikes against another at rest, they will both move in the same direction of the first motion, providing the latter was moveable.

2. If one body strikes another moving the same way, but slower, they will both continue their motion in the same direction as before; and the quantity of motion in both will still be the same.

3. When two bodies with equal quantities of motion tend both directly towards, and strike each other, the whole motion will be destroyed by their meeting, and both will fall to the ground, and be at rest.

4. Two bodies moving directly towards each other with different velocities, will, after the stroke, both continue their motion in the direction of that motion which had the greatest velocity; and the quantity of motion after the stroke will be equal to the difference of their motions before it.

Of the Striking of Bodies which are Elastic.

Suppose two such bodies as A and B; A has three parts of matter and eight degrees of velocity, and B has nine parts of matter and two degrees of velocity; then the quantity of motion in A will be 24, and that of B 18. Now, supposing these bodies to impinge on each other, the velo-

city of each after impact, and the direction of their motions may be known as follows :

1. Let the body of A impinge on B at rest ; then from A take B, and multiply the remainder by the velocity of A ; divide this product by the sum of the bodies A and B, the quotient will express the velocity of A after the stroke. As the body A is less, equal to, or greater than B, so it will be retrograde, or direct in motion after impact. Thus in the present case the difference of A and B is 6, which multiply by A's velocity 8, the product is 48 ; this divided by the sum of the bodies 12, quotes 4, the degrees of velocity with which A will return back after impact.

2. Again, divide twice A's motion by the sum of the bodies, the quotient will be the velocity of B after impact ; thus 48 divided by 12, quotes 4, the velocity of B after the stroke ; so that though the velocity be the same, the motion in both bodies is double to what it was at first in A.

3. Let the bodies both tend one way, and A follow B ; then to the motion of A add twice the motion of B ; from that sum subtract the product of A's velocity multiplied into the matter in B ; divide the remainder by the sum of the bodies, the quotient will be the velocity of A after the impact. As the product is lesser, equal to, or greater than the sum above-mentioned, so the motion of A will be direct, none at all, or backward, after the stroke.

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4. Again, to twice the motion of A add the motion of B, from that sum subtract the product of B's velocity into A; divide the remainder by the sum of the bodies, the quotient will be the velocity of B after the impact.

5. An example of each, in our present case, is as follows: To 24 add 36, the sum is 60, which I take from 72, (as being the greatest) the remainder is 12, which divided by 12, the quotient is 1; so that A returns back with one degree of velocity, having lost *seven*.

6. Again, to 48 add 18, the sum is 66, from which I take 6, and the remainder 60 I divide by 12; the quotient is 5 for the velocity of B's motion.

7. If the bodies tend the contrary way, or meet, then from the sum of twice B's motion, and the product of A's velocity into B, take the motion of A, and divide the remainder by the sum of the bodies, the quotient is A's velocity after meeting; and as the sum is greater, equal to, or less than the said motion of A, the motion of A will be backward, none at all, or forward.

8. Again, to the difference of B's motion and twice A's add the product of B's velocity into A, divide the sum by the sum of the bodies, the quotient will be the velocity of B after reflection.

9. To illustrate both of these cases by our present example. The sum 72 and 36 is 108, from which I take 24, the remainder 84 I divide by

12, which quotes 7 for A's velocity backward. Again, to the difference of 48 and 18, which is 30, add 6, and divide the sum 36 by 12, the quotient is 3 for B's velocity the contrary way.

These rules are applicable to all bodies and celerities, as may be easily demonstrated by a great variety of examples.

Thus much for the laws of nature, motion, and rest. It may be proper, however, to add, that rest is produced either by the weight of bodies and the attraction of the earth beneath, or by their weight and the pressure of the atmosphere above.

All bodies thrown into the air descend in right lines towards the earth's center, unless they are turned out of that course by the force of some agent; but whether they descend in a right, or an oblique course, they draw towards the center, when they come to rest. But the question is, what makes them draw towards the center, is it attraction, or compression?

Many of the philosophers have imputed it to the former, and they have supposed that the earth has such an attraction, that she sometimes draws the moon towards her center, as well as other bodies; that each globe attracts in proportion to its magnitude; hence the moon attracts the earth, but with a less power, than the earth attracts the moon, and that this is the case with all other primary and secondary planets.

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This attracting power is called attraction by philosophers; and the motion of bodies towards the earth's center, &c. is called gravitation. By this power the earth is formed into a dense ball, and things animate and inanimate are confined to its surface. A body left to the power of this agent falls about a rood in the first second of time, three roods in the second second, five in the third, seven in the fourth, &c. agreeable to the following odd numbers, 1, 3, 5, 7, 9, 11, 13, &c. for the *vis inertia* of the falling body, added to the power of gravity, accelerates its motion, and the nearer it approaches to the earth, the swifter will its motion be till it comes to rest.

Hence we may conclude, that if it is the power of the attraction of the earth that draws this body to it, the attraction is greater near the earth's surface, than it is at a distance, because the rapidity of the motion of the falling body increases as it draws nearer and nearer to the earth; but if it is the compression of the atmosphere on the body that drives it towards the earth's center, may we not conclude, that the air is heavier at, and near the circumference of the globe than it is in the upper regions, and that from hence the weight becomes greater and greater as the body subsides which accelerates its motion. But perhaps attraction and compression may both operate together.

A Mr. Pope, whom I mentioned page 45, has imputed the cause of gravity, to the pressure of the
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the atmosphere above, and not to the attraction of the earth beneath; and whether he is right or wrong, I will not undertake to determine at present, but it seems as probable to me that it is from compression, as attraction, for we are told by philosophers, that the air which encompasses the globe hath weight or gravity. That the atmosphere compresseth the earth, with a force nearly equal to that of five thousand millions of tuns. That this pressure on every superficial square foot, is more than 2000 pound weight, that the air is heavier on the surface of the globe than it is at a distance. Now if the earth and waters are compressed with such an amazing weight, will it not tend to drive things towards the center of the globe? Vid. page 283.

Of the Velocity of the Rays of Light.

Light is supposed to arise from a very fine ætherial matter, that is vastly finer than the air, which is the medium by which the rays of those luminous particles are transmitted to our eyes from the sun, moon, stars, and other resplendent bodies.

The rays of light are said to fly 180,000 miles in a second of time; which is one million five hundred and thirty thousand times faster than the motion of a cannon ball, which flies a mile in about eight seconds and a half, hence such a ball would

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would be about $32\frac{1}{2}$ years, in flying to the sun. But rays of light are supposed to be $7\frac{1}{2}$ minutes in descending from the sun to this globe.

Of the different Colours in the Universe.

The colours are seven in number, viz. 1. Red. 2. Orange. 3. Yellow. 4. Green. 5. Blue. 6. Indigo. 7. Violet. (vid. page 166.) But black and white are not reckoned among the primary colours of light, for white is only a mixture of the seven original colours, and black only a hue of those bodies which absorb all the rays of light; and therefore as it absorbeth all the rays, and reflects none back it is properly no colour at all. Hence black clothes attract more heat than those which are white, because they absorb it; but the white reflects it back. Hence also if we put a white glove on one hand, and a black one on the other, and hold them at an equal distance from the fire, the black glove will absorb the heat, and the white will reflect it back, and the difference of the degrees of heat, will be sensibly felt.

Of the Cause of Sound, and the Rapidity of its Motion.

Sound is produced by a stroke, explosion, and some other causes which puts the air in motion like the waves of the sea; which pulsations, striking on the *tympanum*, or drum of our ears,

ears, convey by the nerves the sensation of hearing to our minds.

Some sounds have been heard to a great distance. It has been said, that the explosions of great guns, have been heard 200 miles, but some can hear, as well as see, much further than others.

As to the rapidity of the motion of sound, it depends very much upon the density of the air, or the rarification of the same, for the latter weakens, but the former operates *vice versa*. The velocity of sound at a medium, is about 1142 feet in a second of time. Hence by this rule we may tell nearly, how far an enemy is from us, supposing it is 10 seconds after we see the flash of a cannon, before we hear the report, we may conclude that it is ten times 1142 feet from us, which is equal to 11420 feet; hence also by the same rule we may know the distance of thunder and lightning.

CHAP.

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C H A P. LVI.

How to raise Grapes, Silk, Hemp, and Flax.

IT is said that the art of making wine was discovered by Noah; that it was brought into India by Bacchus, and that none was produced in France in the time of the Romans. It was sold by the apothecaries as a cordial in England, in 1300; and licences were established for vending of it in 1661. But grapes were introduced in England in 1550, and cherries and pears the same year.

I have drank very good wine made of grapes that were raised on Long-Island, in the State of New-York, in America, and have also seen a silk gown that was raised and manufactured in the same Government. As to hemp and flax, a plenty of both is raised in many places on the American continent.

Many excellent wines are produced in France, as the Champagne, Burgundy, Bourdeaux, Gascony, Hermitage, Frontiniac, and Pontacke; and I have often thought that America may produce as good wine, if vines were properly cultivated.

vated. Such a cultivation, as well as that of raising silk, would be a great saving to the community.

We do not want either for heat or cold in America, for both are very extreme in some parts at particular seasons. Hence if cold climates were the most agreeable for the raising of grapes and silk, Canada, Nova-Scotia, and New-England, would be suitable; or if hot climates are the best, then the Carolinas and Georgia may be most convenient. I understand that grapes have thrived very well in South-Carolina, where attempts have been made to cultivate them; and although Paris, the capital of France, is situated in the latitude of 48 degrees and 50 minutes north, which is more than eight degrees further to the northward than Philadelphia; yet they raise a plenty of grapes. It is true, indeed, that the cold is not so extreme there, as it is in the same parallel of latitude in America; but it is much colder in Winter at Paris than it is in England, because it is situated on a continent.

I had the pleasure of viewing the vineyards in France when I was there in 1790. The vines were planted near two feet apart, and were hoed much like the Indian corn in America; they ran upon poles that were about four or five feet high; the grapes hung in clusters almost from the tops to the bottoms of the vines. The time for gathering and making wine is in the Fall. Towards Winter the vines are cut down close to

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the ground, and from their roots another set arise, which bear grapes the next year.

If the tree or vine is wounded in the Spring, it yields a clear, limpid, watery juice, which has been esteemed good for sore eyes, malignant fevers, and a suppression of urine. The flowers have a pleasant smell, and, being distilled in water, yield an essential oil, possessing the fragrance of the flowers. The unripe fruit is very harsh, rough, and sour. The expressed juice, called verjuice, is said to be cooling and astringent; the ripe fruit dried are the raisins and currants of the shops. The juice affords, by fermentation, wine, vinegar, and tartar.

There are about twenty species of vines, according to accounts given by botanical writers; and as to wines, there are a great variety; but those used in the shops of London for medical purposes are the following, viz.

1. *Vinum album Hispanicum*—Spanish white wine, or mountain.
2. *Vinum album Gallicum*—French white wine.
3. *Vinum Canarium*—Canary, or sack.
4. *Vinum Rhenanum*—Rhenish.
5. *Vinum rubrum*—Red Port.

Good wine, drank with moderation, cheers the spirits, warms the habits, promotes perspiration, renders the vessels full and turgid, raises the pulse, and quickens the circulation; it helps digestion, and strengthens the solids. But if it is
drank

drank to excess it hardens the fibres; affects the nerves, diminishes the secretions, destroys the appetite, and generates chronic distempers.

Many of the wines; as well as other liquors, are adulterated, which makes them very prejudicial to health.

Sweet wines abound with a glutinous nutritious substance; they heat the constitution more, and are not so diuretic as other wines. Red wines have an astringent quality; hence they strengthen the tone of the stomach and intestines, and restrain immoderate secretions. Those that are acid are said to loosen the belly and promote urine; but they occasion gouty and calculous complaints, which is the effect of all new wines.

Of the Raising of Silk.

According to chronology, raw silk was made in China 150 years before Christ, and was first brought from India, A. D. 274; silk worms eggs brought into Europe 527; the manufactory of it was introduced in Europe 551, first worn in dress 1455; first manufactured in France 1521, first worn by the Clergy in England 1534, broad silk manufactured from raw silk in England 1620, brought to perfection by the French refugees in London 1687, a silk throwing mill invented at Derby 1719. Vid. p. 11.

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Silk is produced by a curious insect, called a silk-worm, which multiply very fast, as a female will sometimes lay 500 eggs. When a worm is first hatched, it is about the bigness of the head of a common pin. It feeds upon mulberry leaves, and grows to the size of a caterpillar; after which it no longer eats, but prepares for its dissolution. It wraps itself in a kind of silken ball, spun from its own bowels, its head separates from its body, and in every respect changes from its original form, and appears to be destitute of life and motion. However, after it has remained in this condition some time, it awakes, and becomes another kind of insect, resembling a large moth or butterfly. In this last stage the female lays a prodigious number of eggs, after which she dies.

These insects are at first black, then of an ash grey, afterwards they shed their coats, and grow whitish, or rather of a bluish cast; they again shed their skins, and in a few days become yellow, feed a little longer, and wrap themselves in their silken balls, and go through the changes already mentioned.

On the day they begin their balls, they make a kind of flue or down; the next day they begin to form the out-sides in the midst of the loose silk made the day before; on the third day it is entirely obscured, and in a week the buildings are completed. They are of a conic figure, like the eggs of pigeons.

The Chinese have two methods of bringing up their silk-works; they either let them range on the mulberry-trees, or keep them in rooms; the latter produce the finest silk; but if they are not suffered to go abroad, they must be fed with mulberry leaves.

As to the manufacturing of silk, I am not acquainted with the different modes. There are nankins, damasks, sattins, taffeties, brocades, gauzes, &c. which I believe are manufactured different ways. What I have attempted to exhibit is how it may be raised.

Of the Raising of Hemp.

The ground ought to be well manured, and ploughed and harrowed several times. Moist land is esteemed the best, and ashes are the best manure; the seed should be sown early in the Spring, and harrowed in. When the hemp is ripe, it must be pulled; and when dry, the seed may be threshed out. Afterwards the stalk may be rotted in the water, or by being spread on the ground. When it is rotten enough, let it be dried, and put into a barn. In Winter let it be braked and swungled. Hemp is of great utility in the rigging of vessels, and in many other branches of business.

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Of the Raising of Flax.

The ground may be cultivated and manured in the same manner as that for hemp, only some have supposed that it is best to draw a heavy roller over it, to beat it down, after the seed is sown; it may perhaps kill the insects; in other respects it may be managed like hemp.

Linen was first made in England in 153, by Flemish weavers; till then woollen shirts were worn. The linen trade began in Ireland in 1634; and fine linen was made in that kingdom from nettles, in 1755.

C H A P. LVII.

Of Green, Bohea, Congo, Souchong, Singlo, Bloom, Imperial, Hyson, and Gunpowder Teas; and also the Rad. Ginfeng.

TEA was first brought into Europe by the Dutch East-India Company in the beginning of the seventeenth century. In 1666 a quantity of it was brought from Holland to England, and since that time the use of it has become universal.

It grows on a *shrub* in China and Japan, called the *Tea Plant*. It principally grows between the latitudes of 24 and 28. The best teas are to be had at Nankin, in China.

There are several kinds of teas; some finer, smoother, and more fragrant than others, according to the soil they grow in; that called *singlo* is esteemed the most elegant, and used by the more opulent.

Some teas are denominated for their particular colours and qualities. The bohea is much esteemed in China, on account of its flavour and medical qualities. It is from the same plant with the
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green, and only differs from it by being gathered six or seven weeks sooner, that is in March, when in its full bloom, and the leaves are full of juice; whereas the other, by being left so much longer on the tree, loses a part of its juice, and contracts a different colour, taste, and virtue, being more rough to the palate and racking to the stomach. The bohea is gathered in March, the imperial in April, and the singlo in May or June; so that the general division of teas is into two sorts, viz. the green and bohea, which both proceed from the same kind of plant, as already observed; and as to the appellations given to the other teas, they arise from the time of gathering, the province where produced, or the method of curing.

The method of curing is to infuse the leaves in water for a certain time, by which the resinous particles are dissipated, and rendered palatable; for without this operation they would be so bitter, that scarce any quantity of sugar would be sufficient to correct the taste. After this infusion, the bohea is exposed to the heat of the sun, or dried by the fire, till it is crisped, or contracted into the small compass in which we see it.

But the green having been assiduously turned and stirred about the whole time, is strewed upon sheets of copper, (which are gently warmed by embers beneath them) and rolled up and down by persons, whose hands are defended by thick leather gloves from the effluvia, which, without such

precaution, would prove of the most pernicious consequence.

Though the green tea confessedly derives the principal part of its tincture and flavour from the baneful vapours that exhale from the heated copper, these very circumstances, instead of rendering it obnoxious, are the principal recommendations of it, not only to the Europeans and Americans, but to the Asiatics; for such is the infatuation of mankind, that they would rather please the eye and gratify the taste, than attend to the constitution of their bodies, though essential to the preservation of life.

The Chinese make use of a weak infusion of bohea as their common drink: they do not drink it strong, nor use it in the manner we do. It corrects the unwholesome brackishness of their waters, which in some places would breed distempers.

It is deemed by them a great diluter; they drink great quantities of it in fevers, colics, and other acute diseases, and in chronic complaints. They call it a cephalic and diuretic, and good for the head-ache, and to promote urine, digestion, perspiration, and other secretions, and also as a great strengthener of the brain and stomach.

Various opinions have arisen amongst gentlemen of the *faculty* concerning the virtues of tea, both in Europe and America; but some of the most celebrated physicians of the present age

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esteem it as a diluter, agréable to the palate and stomach. It operates as a cephalic, for it eases pains in the head, and prevents stupidity, or sleepiness. It ought not to be drank too hot nor too strong. A strong decoction of green tea will excite vomiting, owing, it is said, to its astringency; but, perhaps, it is from the pernicious qualities imbibed from the copper-plates. It is high time that such an unjustifiable practice was suppressed.

The bohea tea, if not adulterated, is the most wholesome, in my opinion, both for food and medical uses, and may be drank freely, without injuring a person, both in sickness and health. Milk and sugar make tea very palatable.

Perhaps tea may be cultivated in America at some future time.

The *Radix Ginseng* was formerly imported from China, and sold at Boston, in New-England, for a guinea an ounce; but of late great quantities of it have been found in Canada, Vermont, and Pennsylvania, and vast quantities have been exported to the East-Indies. This root ought to be cultivated in those countries, and enough exported to balance the teas imported from the East-Indies.

The Chinese esteem this root as a general restorative and corroborant, and excellent in all decays of age, intemperance, or disease. It is a mucilage, sweet to the taste, with a slight degree of bitterness, and an aromatic warmth. I have

frequently used it for coughs and other disorders of the lungs with success. A drachm, in slices or powder, may be boiled in a gill of water, and the decoction sweetened with sugar, and drank as soon as it is cool enough. This is for one dose; it should be repeated night and morning.

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C H A P. LVIII.

How to manage Bees.

OF bees there are two kinds, the male and female. The former are called drones, the latter, honey, or working bees. The drones are about half as big again as the females. The voice of the drone is much louder and more dreadful than that of the honey bee, and they often excite a causeless fear, for they have no stings, and can hurt no creature, being under the dominion of the females. The bees have also a leader, called the Queen Bee; her body is much bigger and larger than that of a honey bee; her hinder parts are black, and she presides over the rest.

The honey bees have stings in their tails, and when they sting one another, it generally proves mortal both to those who sting and to those that are wounded.

They suck their honey from flowers. It enters into a bottle, or bag, situated in their hinder parts; when it is full, they return home, and empty it into the honey-comb; they also bring home water in the same manner, to mix the beebread with, for feeding their young.

Bees

Bees proceed from small white eggs; they are maggots when they are first hatched.

The tongues of the drones are so much shorter than those of the females, that they cannot reach the honey in the socketed flowers. Hence they cannot work if they would; their business is to stay at home, and sit upon the eggs, which are hatched by their warmth, whilst the female follows the delightful vocation of gathering and bringing home the honey and water.

At about one or two o'clock the work of the day is chiefly over with the females; and on their return home to take care of their young, the drones are suffered to go abroad, to recreate and empty themselves; afterwards they return again to their beloved honey, and are kindly received by their imperious dames.

The females are very careful to work in warm weather, and lay up a flock of honey to prevent their dying in the Winter. In wet Summers and bad weather, they are sometimes hindered from laying up a sufficient store, hence they die, unless they are fed. Some feed them with molasses and gingerbread.

Bees commonly swarm in May and June in America, and have often two or three broods in a season; and if a hive is not prepared for their reception, they are led off by the Queen Bee to a hollow tree, where they enter into a new habitation. Trees have been felled that have had more

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than a barrel of honey in them. But there would be no need of their swarming at all, were their hives large enough to hold the new generation.

The bees often rob each other of their honey. Hence great battles ensue. But if the plundered party have lost their Queen, they will join with the robbers, and suffer all the honey to be carried out of the hive, and when they seek new quarters amongst other bees, desperate wars commence.

Mice, moths, ear-wigs, hornets, wasps, swallows, and sparrows, are enemies to bees. The mice will sometimes make the bees wholly leave their hive.

When the bees bury their dead, they fly off with them, and drop their bodies at some distance from the hive. They do not live much more than a year, as some say.

When people take up their bees, they dig a hole in the ground, and at evening put a lighted match of brimstone into it, and place the hive thereon, which is immediately surrounded with earth, to keep in the fumigation, and prevent the bees from making their escape. They fall to the ground, and die in a few minutes, for the want of air. Afterwards the honey is taken for use. Sometimes 120 pound has been taken out of a hive, which has commonly been sold for sixpence sterling per pound, and the wax for a shilling. Hence the keeping of bees must be very profitable.

Honey,

Honey, as a medicine, is aperient and detergent; it powerfully dissolves viscid juices, promotes the expectoration of tough phlegm, helps a sore throat, coughs, asthmas, and other disorders of the lungs, heals and cleanses the kidneys and urinary passages, and is good for wounds and ulcers; but it is hurtful to bilious, hypochondriac, hysteric, and melancholic habits; for it generates bile, and sometimes pain, if eaten when new; this may, however, be prevented by the boiling of it before it is eaten. The dose alone is from one ounce to two.

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CHAP. LIX.

*Of the Raising of Horses, Cattle, Sheep, and Swine.
Observations on the Eating of Swine's Flesh.*

THE barns in America ought to be built of brick or stone, that the horses, cattle, and sheep, may be kept warm; for they will eat less, and thrive better, if they are kept so, than when they are pinched with the cold. But sheep ought not to be kept too warm, for it will cause a relaxation of their cutaneous pores, and make them lose their wool.

All these animals ought to be fed often, kept clean, and to have water in season; and if they are remote from the sea, or live on fresh grass, or hay, they should have salt three or four times in a week, if not oftener, for it will make them eat, drink, and thrive much better than they will if they live without. Some sprinkle a weak brine on their hay, which will make them eat it, if it is not good.

Horses and cattle should be curried with a curry-comb twice or thrice a day, for it promotes the circulation of the fluids, and makes them thrive.

All

All these animals are very profitable when they do well, and those that raise them commonly grow rich, if they are prudent, and have good farms. We have had some cows in America, that have given about 20 quarts of milk in a day. But all these kinds of cattle are not very large in Canada, by reason of the extremity of the Winters; however, the horses, cattle, and sheep, are very good in New-England, New-York, &c. Sheep produce both meat and clothing. Great care ought to be taken of the lambs when they are young, to prevent their being devoured by wild beasts, dogs, and swine. About half a pint of Indian corn given to a sheep every day is said to be very good just before and after she has brought a lamb.

Swine ought to be kept warm and clean, and to be fed often; but they are very unruly, and especially if they are suffered to run at large, for they will be rooting up the ground and getting into mischief, if they are not yoked and ringed. They are an unprofitable animal, for, like the *miser*, they do no good until they are dead.

Some people have supposed that their flesh is not fit to be eaten; I shall therefore adduce some reasons on their side of the question.

We find that nothing is more strictly forbidden in the *Law of Moses*. For the commandment of the Almighty runs thus:

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“ shall ye not touch : they are unclean to you.”
 Vid. Levit. xi. 8. And it seems that Christ himself was no great friend to the swine, otherwise he would not have suffered the devils to have entered into them, nor have suffered their owners to be deprived of their property, by letting their swine run violently down a steep place into the sea, and perish in the water. Vid. Matt. viii. 31, 32.

Now, if the swine were unclean to the Jews, how comes it to pass that they are not so to other nations?—In the London Practice of Physic, page 5 of the introduction, we are told, “ that pork fed in London is far from being wholesome diet.” If that is true, then surely it ought not to be eaten. I never eat much pork myself; but sometimes when I have been upon a journey, or have fell into company, I have eat some of it, and if it was fresh, it has produced a nausea, griping pains, and a diarrhœa, both in Great-Britain and America, but it does not have such an effect upon every constitution.

According to the accounts mentioned by some physical authors, swine's flesh generates the leprosy, and other cutaneous eruptions, in divers countries, and especially in hot climates.

The Jews obey the commandment of the Lord to this day; for they abstain from the eating of swine's flesh, and other unclean things forbidden in the Mosaical law. I once asked a Jew, why he did not eat swine's flesh, and he said, it was because
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it is unwholesome. I was afterwards credibly informed, that several of his young children went to a neighbour's house, where they eat some pork, but soon returned home, and told what they had been eating; the father gave them an *emetic*, which soon made their stomachs discharge their contents.

According to the Law of Moses, all kinds of beasts are unclean but those that divide the hoof and chew the cud; and all kinds of fishes, excepting those that have fins and scales. There are also clean and unclean fowls.

Many besides the Jews adhere to the Mosaical law, in regard to animal food.

The inhabitants of Abyssinia abstain from blood, things strangled, and those unclean birds, beasts, and fishes, mentioned by Moses. This is a great country, for it is about 1300 miles long, and 1100 broad.

The Persians eat no pork, nor any thing forbidden in the Mosaical Law; their country is also large, being about 1200 miles square.

The Empire of the Great Mogul is about 1700 miles in length and 1300 in breadth. The inhabitants do not eat swine's flesh.

These things being premised, I shall proceed to make some philosophical observations.

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filthy things, must be unclean, and of course unwholesome to the human race.

Fish that live upon beds of copper mines are poison, because their bodies are impregnated with the qualities of that mineral.

That the swine will feed upon the worst of carrion, and other filthy things, is evident to every one that is acquainted with those animals. And if their flesh is unclean to the Jews, and to the inhabitants of those great countries which I have mentioned, how comes it to pass that it is not so to other nations? If the learned and ingenious physicians have discovered, that pork fed in London is far from being a wholesome diet, should not the raising of it be suppressed? Why should the people be suffered to raise and eat things prejudicial to their health?

But if any should object, and say, that the swine may be shut up, and kept from eating unclean things, and that their flesh may thereby be made wholesome, I answer, that although that may tend to make their flesh more wholesome than it might be if they fed altogether upon poisonous things, yet some animals are unclean and unwholesome in themselves by Nature.

Surely the Great Governor of the Universe knew what was so and what was not. The commandment I have mentioned came from him, for the chapter (viz Levit. xi.) begins thus—"And

" the Lord spake unto Moses, and to Aaron,

Q q

" saying,

“ saying unto them, Speak unto the children of “ Israel, &c.” and nothing is more strictly forbidden, not even murder and theft, than the touching and eating of *swine’s flesh*.

But, perhaps, some may say, that this command was ceremonial, and is abolished.

I answer, that we have no account of its being abolished, neither in the Old nor in the New Testament ; and that by the same rule they may say, that the command against murder is also abolished.

But some have pretended, that all those unclean animals were changed, or made clean, at the time that Peter went into a trance, and saw Heaven opened, and a certain vessel descending unto him, which contained all manner of four-footed beasts of the earth, and wild beasts, and creeping things, and fowls of the air, when a voice said, “ Rise, Peter, kill, and eat. But he said, Not so, “ Lord ; for I have never eaten any thing that is “ common or unclean. And the voice spake unto “ him again, saying the second time, What God “ hath cleansed, that call not thou common.” This was done *thrice*, and the vessel was received up again into Heaven.

By this text it appears, 1. That Peter, who had been one of Christ’s disciples, and was instructed by him in the principles and doctrines of the Christian religion, had always adhered to the law of Moses, by abstaining from the eating of swine’s flesh, and other unclean animals.

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2. That although all kinds of beasts, creeping things, and fowls, were presented before him, he was not commanded to kill, or eat, those that were unclean.

3. That we have no account of any fishes being in the vessel. Hence if the birds and beasts were all made clean, it seems that nothing was done for the fishes, and that those that have not fins or scales still continue to be unclean.

4. That this vision had no reference to the changing and purifying of the natures of the swine and other unclean animals, but to the cleansing of the nations; for after Peter had doubted for some time concerning the meaning of the vision, and had fell in company with Cornelius, who was one of another nation, and with whom Peter had supposed it was unlawful to keep company, he said, "But God hath shewed me, that I should not call any man common or unclean." And after further consideration, he said, "Of a truth I perceive, that God is no respecter of persons: but in every nation he that feareth him, and worketh righteousness, is accepted." That as he was preaching, the *Holy Ghost* fell on all them which heard the word, and caused an astonishment amongst those of the circumcision, &c. that believed, because that on the Gentiles also was poured out the gift of the *Holy Ghost*, which purges, purifies, and cleanses the nations from inward filth and pollution; so that the vi-

sion could have no reference to the cleansing of the unclean birds, beasts, and fishes, but to the cleansing of the Gentile nations only. Vid. Acts x. 9, &c.

If any should say, that liberty was given for the eating of unclean things, because it seemed good to the *Holy Ghost*, and to the *Apostles*, to lay no other burthen upon the Gentiles than the abstaining from meats offered to idols, from blood, things strangled, and from fornication. Vid. Acts xv. 28, 29.

I would answer,

1. That this was a determination of the *Apostles* at a time when they were assembled at Jerusalem, to consult about circumcision. For it appears that certain men had taught, that except the Gentiles were circumcised, they could not be saved; and as the law of Moses, which strictly forbids the eating of unclean things was read in the synagogues every Sabbath-Day, the *Holy Ghost*, nor the *Apostles*, did not incline to lay on the new converts amongst the Gentiles any other burthen, but the abstaining from meats offered to idols, from blood, things strangled, and from fornication.

But we must not suppose, that either the *Holy Ghost*, or the *Apostles*, gave liberty to commit murder, theft, adultery, and other atrocious crimes, because they did not see fit to lay any other burthen upon the Gentiles, but the four things already

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ready mentioned ; for no other part of the Mosaic law was abolished by the dispensation of the Gospel, but the ceremonial, which stood only in meats and drinks, and divers washings, and carnal ordinances, which imposed upon the Jews, until the time of the reformation, (vid. Heb. ix. 10.) until the New Covenant, or Dispensation of the Gospel should be established, the laws put in the minds, and written in the hearts of believers. Vid. Heb. viii. 10. so that the moral part of the law of Moses remains in full force to this time, and ought to be observed by all nations ; for it corresponds exactly with the principles and doctrines of the Christian religion. Does the Gospel forbid murder ? Yes, and so does this law. Does the Gospel forbid theft ? Yes, and so does this law also ; so that they both correspond in pointing out the principles of morality. As to the meats, drinks, washings, and carnal ordinances, which belonged to the Old Covenant ; they consisted in those bulls, goats, and other animals, that were offered as a sacrifice under the Mosaic law, and the drinks and purifications used in those times.

The eating of swine's flesh is a practice that was undoubtedly derived from the Pagans, and took its rise before the Mosaic law was given ; and this practice has been handed down to us by tradition ; for as our fathers did so do we ; and

because it is customary we continue the practice ;
for,

Custom is a living law, whose sway
Men more than all the written laws obey.

Had our teachers taught us when we were young,
that swine's flesh is unwholesome and unclean, and
that it is a transgression of the law of God to eat,
or even to touch it ; we should have esteemed our
practice to be a great sin.

But though my doctrine may suit the Jews and
other nations who observe the laws of the Lord,
yet I do not expect it will please all the raisers
and venders of swine, nor all the lovers of pork ;
and, perhaps, some of them, may burn my book,
because I have laid down these principles ; but by
the same rule they may burn their Bibles, for the
very same doctrine is mentioned there that I hold
up, and it proceeded from the *Almighty himself*.

Some of the savage Nations eat human flesh ;
and if I should go and tell them that it is unwhole-
some and illegal, it is probable they would not be-
lieve me, and that I should make myself very un-
popular amongst them, by preaching such a doc-
trine. The same may be said of the Turks ; should
I go amongst them and preach against the eating
of camel's flesh.

But why do not the Christians eat human flesh
like the Savages ?—Why, because it is not the cus-
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tom.—Why do they not eat camel's flesh like the Turks?—Why because it is not the fashion?—Why do they not eat horses, dogs, cats, rats, and mice? Why because they have not been brought up to it?—Why do they not wear a cap of cow-dung, foot and greafe, and choose to live upon the entrails of animals, instead of their flesh, like the Hottentots?—Why because they have not been accustomed to it—But why do they eat swine's flesh when it is forbidden by the law of Moses, and found to be unwholesome by the Physicians?—Why because they have imbibed the practice from their cradles.

But perhaps some may say, that the people would starve, if there were no swine.

I answer, that the expence of raising swine is very great; and that if the clean things which they eat, were to be given to the cattle and sheep, it would do more good, more meat would be raised, and with less expence: it would be more wholesome, and better for the community; and this is not only my opinion, but the opinion of many of the American farmers. But some have pretended, that all unclean animals are cleansed under the Gospel, because Christ said, "not that which goeth into the mouth, but that which cometh out defileth the man." But the question is, what the man was that Christ meant? Divines have frequently mentioned an inward and an outward man in America; hence they have prayed, just before they were about to deliver a sermon, "that

“they might be strengthened both in the inward
 “and in the outward man.”* Now if Christ meant
 that the outward man could not be defiled by
 things that goeth into the mouth, then of course
 we may eat all kinds of filth and poisonous things,
 without being defiled; but our senses tell us bet-
 ter, for we know that if we should voluntarily eat
 such things, they will defile our bodies, and soon
 put an end to our existence; and that we should
 be guilty of self-murder by so doing. But it is
 evident that Christ did not mean the present
 earthly tabernacle, or outward man; but the in-
 ward man, for when he came to tell what it was
 that defiled the man, he had alluded to; he said;
 “But those things which proceed out of the
 “mouth, come forth from the heart, &c. That out
 “of the heart proceed evil *thoughts, murders, adul-*
 “*teries, fornications, thefts, false witness, and blas-*
 “*phemies.*” Vid. Matt. xv. 10, 11.—19, 20.

That those were the things which defiled the
 man. But if he had meant that the poisonous na-
 tures of unclean animals were changed, he would
 undoubtedly have told his disciples; and Peter
 would not have thought that some of those ani-
 mals which he saw in his vision were unclean.

But I have another objection to answer, before
 I quit the field, which is, that all unclean animals
 have been cleansed and made fit for human food,
 according to the direction of the Apostle Paul
 given to Timothy. The words run thus: “Now
 “the spirit speaketh expressly, that in the latter

* Eph. iii. 16.

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" times some shall depart from the faith, giving
 " heed to seducing spirits, and doctrines of devils.
 " Speaking lies in hypocrisy, having their consci-
 " ence seared with a hot iron ; forbidding to marry,
 " and commanding to abstain from meats, which
 " God hath created to be received with thanksgiv-
 " ing of them which believe and know the truth.
 " For every creature of God is good, and nothing
 " to be refused, if it be received with thanksgiv-
 " ing : For it is sanctified by the word of God and
 " prayer." Vid. 1. Tim. iv. 1, 2, 3, 4, 5.

Now the question is, what were those meats
 which God had created to be received with thank-
 giving ? were they only some of the flesh of those
 clean beasts, &c. that are mentioned in the Mo-
 saical law ? or do they include all kinds of mad-
 dogs, serpents, and other poisonous animals ?
 Have we any account that informs us, that the
 Apostle ever eat any swine's flesh, mad-dogs, or
 serpents ? or that he ever received any such animal
 food with thanksgiving, or that it was ever sancti-
 fied to him by the word of God and prayer ? If
 all those poisonous things were included, why did
 he not tell us plainly that they had been unclean
 under the law of Moses, but were changed under
 the Gospel, and that himself and his converts made
 use of swine, serpents and toads in their diet ?—
 At another time he said, " For I have not shun-
 " ned to declare unto you all the counsel of God."
 Vid. Acts, xx. 27. Now if any such thing had
 taken

taken place as the changing of the natures of poisonous animals, or if that had been the counsel of God, it seems that the Apostle knew nothing of it, or if he did, he uttered a falsehood by saying, he had declared all the counsel of God, when he had kept a matter of such great importance behind the curtain, without revealing it to the world.

But it is said, that every creature of God is good, and nothing to be refused, if it be received with thanksgiving, for it is sanctified by the word of God and prayer.

These creatures of God unless we explain the Scripture in a spiritual sense cannot, in my opinion, be any thing but those made and chosen for the food of the human race, ~~and animals that he had~~ which are made holy by those who use them with moderation, and receive them with thanksgiving; and though every thing is good in itself, as a part of the creation, yet we cannot suppose that every thing is fit to be eaten. It is said, that when the Almighty viewed every thing that he had made, behoid *it was very good*. Vid. Gen. i. 31. and although Adam and Eve were placed in a pleasant garden, yet there was a *forbidden fruit* in it; and we find that there is still a *forbidden fruit* to the posterity of Adam, which consists in those unclean birds, beasts and fishes, that are poison to our bodies, and destructive to our constitutions. A catalogue of these animals may be seen in the eleventh chapter of Leviticus.

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Having thus explained the words of the Apostle in a literal sense; let us in the next place attempt to do it in one that is spiritual. Were not those *meats* God had created to be received with thanksgiving, by them which believed and knew the truth, *spiritual meats*? Christ told the Jews to labour not for the meat which perisheth, but for that *meat* which endureth for ever. Vid. John vi. 27. And the apostle Paul in his Epistle to the Corinthians, speaking of the Israelites passing through the sea, mentions a *spiritual meat*, saying, "And did all eat the same *spiritual meat*." Vid. 1. Cor. x. 3. Now this *spiritual meat* is nothing but the *bread of life* that cometh down from Heaven, and giveth life to the world. Vid. John vi. 50. It is the *hidden manna*, the *tree of life*, and the inward and *spiritual supper of the Lord*. Vid. Rev. ii. 7—17. Chap. iii. 20. Now the Israelites that passed through the sea did all eat of this *heavenly meat*, and so did those Christian converts to whom the Apostle wrote his epistles. Hence all true believers, or all holy and upright persons, are partakers of this *heavenly food*. It is the *Holy Ghost* descending from Heaven and dwelling in the righteous. Hence they become the *sons of God*. Vid. Rom. viii. 14. And their *bodies* are the *temples* of the *Holy Ghost*. 1. Cor. vi. 19. Which they are commanded not to *defile*. 1 Cor. iii. 17. Hence also the Almighty *dwells* in his *saints*, *walks* in them, and *strengthens* and *enables* them both to *will* and to
do

do of his own good *pleasure*: they who are thus made to partake of this spiritual meat, do taste of the heavenly gift, are made partakers of the *Holy Ghost*, have tasted the good word of God, and the *powers of the world to come*. Vid. Heb. vi. 4, 5. They are thereby *married*, or *joined* to the *Lord*; and being thus *joined* unto him, become *one spirit*. Vid. 1 Cor. vi. 17.

The ministry of the Apostles under the dispensation of the Gospel, was *spiritual*, and not carnal; hence it was said, that God had made them able ministers of the New Testament; not of the letter but of the *spirit*. Vid. 2 Cor. iii. 6. This ministry did not consist in meats, and drinks, and divers washings, and carnal ordinances, like the ministry of the types and shadows under the Mo-
saical law: but in the glorious ministrations of the spirit. Vid. 2 Cor. iii. 8.

Hence it appears that the *meat* that the Apostle mentioned to his son Timothy, was not carnal but *spiritual*. Hence also it could not be the flesh of bulls, goats, calves, lambs or swine; but that *spiritual meat* which giveth *life* to the world, of which all good people are made partakers.

So that the *marriage* alluded to might be *spiritual*; and, also the *meats*, which God had created to be received with thanksgiving by them which believed, &c. and every creature of God that was thus married, and fed by this spiritual meat was good; being sanctified by the *word of God* (Vid. John,

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i. 1.) and prayer, and therefore ought not to be refused, or denied an admission into the outward and visible church.

That this ministry was spiritual, is evident by the directions that Paul gave Timothy, in the 14th verse of the same chapter. "Neglect not the gift that is in thee," which was a spiritual gift.

Thus have I endeavoured to explain this text in a spiritual sense, which wholly excludes animal food, or any purgation of the brute creation.

Let us observe, that if we take the text in a literal sense, the most filthy and poisonous animals are good, and are not to be refused in our diet, because they may be sanctified by the *word of God* and *prayer*. How absurd and ridiculous must such a way of reasoning be? Can all the Clergy, and all the good men in the world, by praying over the carcase of a mad dog that is full of the most deadly poison, change its nature, and make it a clean beast?—No, no such thing can be expected.

The things that I attempt to hold up and plead for are,

1. That if swine, and some other animals, were unclean under the Mosaical law, they continue to be so under the Gospel; that their natures have not been changed, and therefore they must still be unwholesome to the human race.

2. That

2. That the flesh of all animals fed upon filthy and poisonous things, is not fit to be eaten.

3. That as the swine naturally feed upon such things, they always were, and still continue to be unclean.

4. That the *Great Governor* of the *Universe*, knowing they were unclean and unwholesome, was pleased, in his infinite wisdom to make it known to the sons of men, and to forbid their eating or touching their flesh.

5. That that law still remains in force, and ought to be observed by all nations.

6. That the practice of eating swine's flesh commenced in Christendom in the times of Paganism, and has been handed down to the present generation by custom and tradition.

7. That it is our duty to abstain from every thing that may defile our bodies, or prejudice our health and constitutions.

8. That if we live altogether, or in part upon swine's flesh, the whole of our bodies, or a part, will be swine, though in a different form, and perhaps have a swinish temper and disposition.

9. That the Jews, Persians, Abyssinians, and habitants of the empire of the Great Mogul, do their duty in obeying the commandment of the Lord, in abstaining from those unclean things mentioned in the law of Moses.

10. That the learned and ingenious physicians of the kingdom of Great-Britain ought to be applauded

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plauded for their observations upon the operation of swine's flesh in the human body; and for making known to the world, that it is by no means a *wholesome diet*.

11. That it is our duty to make further observations, and to expunge out of our diet, and out of the practice of physic, every thing that hath already been, or may hereafter be, found prejudicial to our constitutions.

12. That we ought not to eat any thing offered to idols, nor any animal that dies of itself, nor things strangled, nor any blood, or unclean thing, and to remember, that he that said, "Thou shalt not kill," said also, concerning the eating of swine's flesh, "*Of their flesh ye shall not eat, and their carcase shall ye not touch.*" Levit. xi. 8, 44.—Isai. lxxv. 4.

Although I have raised the argument to its present height, perhaps some may say, that swine's flesh is wholesome, and that it is lawful to eat it, though it is forbidden in the law of the Lord, because they have been accustomed to it, and it agrees with their constitutions.

I answer, that though it may seem to agree with a few constitutions for a time, yet it may produce ill effects afterwards. The savages may say, that human flesh agrees with them, and yet it may be very prejudicial to their health, operate in an invisible manner, like slow poison, and prove fatal at last.

Those

Those who have perverted the Scriptures, by pretending that the natures of unclean animals were changed, and that they were cleared of their poison under the dispensation of the Gospel, must prove, before they can make me believe it, that Christ and his disciples eat swine's flesh, mad dogs, toads, and serpents. But as no such thing is mentioned in the New Testament, we must conclude, that they subsisted upon a wholesome diet, walked honestly, and lived peaceably, without setting any bad example for their followers to practise.

But what inhuman, disgraceful, and abominable conduct has there been in the different centuries that have rolled off since Christ was upon earth, amongst the inhabitants of Christendom, who have pretended to be his disciples. How have they violated the laws, by following the example of the heathen, in defiling themselves with unclean things? How have they wrangled, quarrelled, and murdered one another; burnt great cities, and laid countries waste? Now had they followed the example of the Prince of Peace, all those murders and devastations would have been avoided.

I have often thought, whether an improper regimen does not have an effect upon the tempers and dispositions of men. Who knows but that many have had swinish tempers and dispositions, by reason of their living upon swine's flesh.

Brandy and gunpowder, or rum and gunpowder, drank just before men rush into battle,
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will make them fear no danger; and the saliva of mad animals will produce madness; and why may not the flesh of those that are naturally unruly, filthy, and unclean, affect our constitutions, tempers, and dispositions, in a greater or lesser degree? Surely, we ought not to defile ourselves with such abominable things, but to make a difference between those animals that may be eaten and those that may not, for the former are clean, but the latter are *vice versa*, (vid. Levit. xi. 44, 47.) this will tend to preserve our health and happiness, a thing ^{is} required of us by HIM, whose laws and commands are *holy, just, and good*. Vid. Rom. vii. 12.

C H A P. LX.

Sundry Observations of the Multiplicity and Longevity of Animals. Cautions concerning unruly Creatures.

IN the preceding Chapter I have treated upon a subject that may please some people and displease others. For the lovers of swine's flesh, and those who get money by the raising and selling of it, would not be willing to forsake a thing they so much admire, even if there was a law made against it. However, as it is the duty of every person to disclose to the Public, whatever appears to be prejudicial to the community, I hope I shall be excused for the method I have taken. They that lay down a doctrine according to the *law* of the *Lord*, and the principles of natural philosophy, have a much better foundation to work upon than those who have nothing but *tradition*, and the example of the Heathen. Vid. *Ifai. lxx. 4.*

We laugh at other nations on account of some of their ill customs and manners, and it is probable they laugh at us for some of ours. But I hope there may be a general reformation in process of time, that as the knowledge of philosophy advances,

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advances, every thing that is prejudicial to our health and happiness will be removed out of the way.

Those who may be pleased to forsake the practice of raising swine, may raise cattle and sheep with less trouble and expence, have more meat, and that which is much more healthy and suitable for their constitutions.

These things being premised, I shall, in the next place, say something concerning the multiplication and longevity of animals.

Multiplication.

			<i>Young brought at once.</i>
Mare goes with young	11 months,	from 1 to 2	
Cow	9 ditto,	1 — 3	
Ewe	20 weeks,	1 — 3	
Goat	20 ditto,	1 — 3	
Sow	16 ditto,	4 - 16	
Bitch	9 ditto,	3 — 4	
Cat	9 ditto,	2 — 4	
Fox	9 ditto,	1 — 4	
Elephant	3 years,	0 — 1	
Bear	40 days,	1 — 2	

The Longevity, &c.

	<i>Years.</i>	
Horfe has been known to live		40
Ox	—————	16
Bull	—————	16
Cow	—————	16
Sheep	—————	10
Goat	—————	10
Swine	—	20
Dog	—————	20
Cat	— — — — —	10
Fox	—————	15
Camel	—————	100
Dromedary	—————	60
Elephant	—	200

Fowls.

Swan	—————	300
Goose	—————	300
Dunghill cock	—————	10
Pelican	—————	60

But a few of these animals arrive to the age I have mentioned. The age of the goose is doubtful.

Cattle that are apt to push with their horns, or run at people, ought to be kept in close confinement, or killed immediately. I have been knocked down twice by such kinds of mad animals. And I was acquainted with a gentleman who was killed by a ram that was wont to push with his horns.

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C H A P. LXI.

*Observations on the Freedom of Speech, and the Liberty
of the Press.*

I HAVE already mentioned, page 123, "That the *freedom of speech*, and the *liberty of the press*, are the natural rights of every man, providing he doth not *injure himself* nor *others* by his *conversation* or *publications*." But people have sometimes been *debarred* from the *liberty* of these *natural rights* by *tyrants* and *rebels*. The innocent have been confined in prisons, upon false accusations, and not allowed the privilege of defending themselves, either by the freedom of speech, or the liberty of the press, whilst to destroy their reputation, slander and defamation has been spread abroad by lying tongues, licentious presses, and pulpit oratory.

When rebels can obtain the command of these powerful engines, viz. the lying tongue, licentious press, and the clergy, sedition may be easily fown, treason and rebellion excited, the government subverted, and anarchy and confusion let loose

loose, to the destruction of the lives, *liberty* and *happiness* of the people. And if any peaceable and quiet person refuses for conscience sake, to follow the multitude to do evil; or if he endeavours to convince the misguided of their error, or if he even lies still, and attempts to be *neuter*, and the slandering tongue is let loose against him, he must be dragged off to *prison*, confined in a *dungeon*, and not allowed the *liberty* of *speaking*, *writing*, or *printing* any thing in his own *defence*.

But although the freedom of speech, and the liberty of the press, should not be denied to any person, yet these liberties ought not to be converted to licentious practices, for they tend to destroy the public tranquillity and make mankind unhappy.

I shall conclude this chapter with the following lines :

THE FREEDOM OF THE PRESS.

Though men and women have a *right*,
 With pleasure and with ease,
 To *speak* and *print* as they *delight*,
 Whenever they may please.

Yet, they've no *right* for to expand,
 (Contention to encrease,)
Sedition through the *peaceful land*,
 To interrupt the *peace*.

Hence

Hence the vile wretch, that wou'd *suppress*,
The *grand important thing*,
The *freedom of the printing-press*,
Most *surely* ought to *swing*.

And *he* that doth *sedition sow*,
With his *tongue*, or the *press*,
Unto the *gallows* ought to *go*,
For such *base wickedness* :

Because it may make *wars arise*,
Destruction too *expand* :
The *people loose* their *precious lives*,
And *desolate* the *land*.

Let *all* therefore who do *regard*,
Their *good* the world around :
Stand constantly upon their *guard*,
That *peace* may still *abound*.

Suppress *sedition*, *wrath*, and *strife*,
Make *wickedness decrease*,
And truly live a *pious life*,
In *harmony* and *peace*.

That when they *die* they may *arise*,
Where *peaceful ones* are *blest*,
In *realms of joy* above the *skies*,
With *happiness* and *rest*,

Composed at London, May 29, 1791.

CHAP. LXII.

Magnetical Communications.

IT was not my design to have said any more upon *Animal Magnetism* in the *American Oracle*, inasmuch as I have already treated of it in the 23d chapter; where, after a deep contemplation on the subject, I attempted to render a *philosophical reason* for the wonderful operations of the *magnetical effluvia* upon the *human frame*: But as I have received further information; and have an inclination to promote the *progress* of *science*, by disclosing every thing that may induce mankind to make further discoveries and improvements in things that may be beneficial to the human race; I shall just mention in this chapter, some of the benefits which have already resulted from magnetical operations, as communicated to me, by Mr. *John Cue*, of the City of London, a very *worthy gentleman*, who, not for worldly gain, but for the sake of *relieving* the *distressed*, and making *discoveries* and *improvements* in the science, has been a constant *practitioner* in *Animal Magnetism*, ever since

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since the 3d of November, 1789; and although, he has often had more than one hundred patients in a day, and has wrought many *cures*, yet he has not charged one *farthing* for his *services*; and I understand that he intends to *praestare gratis* for the future; from hence we may conclude, that he has no inclination to impose upon the public, either by continuing the practice of the science, or by any account he has communicated concerning the benefit of his magnetical operations.

I have received a great number of *certificates*, which give an account of some of the remarkable *cures* which this gentleman has wrought by this new *remedy*; but, for the want of room, I shall mention but a few of them, which are as follows, viz.

I, *Jane Castle*, of No. 14, Crispin-street, Spital-fields, do declare, that I have been afflicted with a severe rheumatism in the whole habit, but especially in my head, stomach, arms, hands, loins, side, legs and feet, attended with such excruciating pains, as led me to apprehend every paroxysm would terminate in my death; besides which I had a continual swimming in my head, and a great swelling in my legs. In this unhappy state I continued for the space of 25 years, though under the care of several eminent physicians, but without success. On my first application to the faculty, they ordered me an issue in each leg but without the least relief. I was also subject to such
cold

cold sensations, that I could never go to rest without hot flat irons bound in flannels being applied to my stomach, when at the same time my feet were by an intermitting fever, in such violent heat as to oblige me always to lay them out of bed. My disordered state of body continued to grow worse, so that at last I was afflicted with epileptic fits. In this unhappy situation I applied to Mr. *Cue*, to be treated by the remedy commonly called *Animal Magnetism*; when, to my great surprize, I had no sooner sat down, than my whole frame was put into the most violent *conflict* and *perturbation*: I began to lose my recollection, and imagined myself in bed, and felt as if were the flannels with the hot irons dropping from me: at the same time I had a sensation of something like an *electric shock*, *piercing me through and through*, and from that time my fits left me, with all my other disorders. My issues dried up, although I used every method to keep them open, yet received *no injury* therefrom; and though I was 70 years of age, when I applied to Mr. *Cue*, yet *thanks be to God*, I obtained a perfect *cure*, and now enjoy a good state of health, though my first application to him was in January 1790

May 3, 1791.

JANE CASTLE.

John Dorking, of Westham, in Essex, breeches-maker, affirms, that he was afflicted with a severe rheumatism in the whole habit, but especially of the right arm and head, for the space of eight years;

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years; during which time, a great variety of medicines were tried without effect—till fortunately hearing of the *cures* performed by Mr. *Cue*, he applied to that *gentleman*, who generously undertook, and in a short time *restored* me to the use of my *arm*, removed the *pain* and *giddiness* of my *head*, and I am at this time in perfect health. Witness my hand, this 28th of July, 1790.

JOHN DORKING.

Witness Thomas Marsh, M. D. of Highworth.

I, *Mary Gill*, daughter to Mr. Richard Gill, shoe-maker, No. 9, Great East-Cheap, aged 25, have been unhappily afflicted with the disorder called the epilepsy, or falling sickness, from the time, I was 13 years of age; and at the age of 16, I grew much worse, my fits came on every fortnight, and often continued eleven hours. But, by the blessing of God, to all human appearance, I have met with a complete cure, by the treatment called *Animal Magnetism*, without any other remedy whatsoever, having been recommended to Mr. *Cue*, for that purpose, and now am to be heard of at Messrs. Simpson's and Robinson's, Hoxton,

MARY GILL.

N. B. For the above disorder I was a patient in Guy's-hospital, but discharged as incurable, March 19, 1791.

I was present and saw the wonderful operations of the magnetical effluvia upon this patient;
when

when she went in a crisis, she commonly sprang up from her chair, took hold of something, and afterwards had much such agitations and convulsive motions as described, page 208.

I shall conclude this chapter by just mentioning a few of the other remarkable cures performed by Mr. *Cue's* magnetical operations, without extracting the whole of the certificates; but it appears that the greatest part of his patients had been given over as incurable by the physicians.

Mrs. Lucius Philips, No. 5, Paddington-green, after labouring under a grievous nervous complaint for near six years, received a *perfect cure*, only by one *magnetical operation*.

Mrs. Mary Stears, having been afflicted eleven years with the sick head ach, vomitings, numbness, pain, and hardness in her side, swelling in her legs, cold sensations, &c. received a complete cure by Animal Magnetism; and for a sprain in her knee received afterwards, was *cured* by the same *remedy*.

Mrs. Charlotte Rotelage, No. 20, Providence-row, after having the sick head ache, and a pain in her side for two years, received a *perfect cure*, by the *magnetical effluvia*.

A child, aged five years, belonging to Mrs. Elizabeth Cleveland, Paddington-green, after being afflicted with blindness seven months was cured in three weeks, by being treated twice in a week.

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A child aged three years, belonging to Mrs Martha Allen, No. 9, Motley-court, Holywell Mount, after being treated twice, voided 20 knots of worms, and was restored to health.

A boy who had a decline, belonging to Mr. Travers Arundell, Keat-street, Spital-fields, was completely cured.

Mrs. Mary Swan, No. 23, St. John's-square, Clerkenwell, having been deaf eleven years, was cured of the disorder.

Mrs. Mary Bay, No. 10, Slaughter-street, Bethnal-Green, having been afflicted five years with a fever, and a pain in her side, was restored to perfect health.

Mrs. Margaret Tyson Surry, side of Blackfriar's-road, after labouring under a rheumatic complaint, attended with great pain for three years, was restored to *health*.

A child aged 13 months, belonging to Mr. John Johnson, Motley-court, Holywell-Mount; was *cured* of an inflammation in the stomach and bowels, attended with a hard swelling and convulsions.

Mrs. Mercy Benson, having been afflicted five years, with epileptic fits, attended with a delirium, was restored to her health and senses.

Mrs. Jane Allen, No. 146, White Cross-street, was *cured* of various disorders of 12 years standing, occasioned by her drinking cold water, when she was very hot.

Mr.

Mr. Steven Holden, No. 167, White-Cross-street, having been afflicted ten years with lameness, a loss of appetite, memory and eye-sight, occasioned by lying in a damp bed, was restored to *perfect health*.

Mrs. Elizabeth Hathaway, Houndsditch, was afflicted about three years with a violent pain in her face, caused by a cold, which terminated in a locked jaw, and rendered her situation so dreadful, that she almost perished with hunger; but to her unspeakable surprise and joy, was so far relieved in 20 minutes, after Mr. *Cue* began to treat her, that she could take a table spoon into her mouth, and at last received a *perfect cure*.

Besides these remarkable cures, the certificates mention others performed on patients, some of which were afflicted with blindness, some with deafness, loss of speech, fevers, violent pains, lameness, ulcers, flatulencies, palpitation of the heart, obstructions, nervous, bilious, hysterical, scrophulous and asthmatical complaints. Such have already been the wonderful operations and good effects of the magnetical effluvia in the cure of distempers. Let the science therefore be still cultivated and improved in the best manner.

CHAP.

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CHAP. LXIII.

Modern Discoveries, Inventions, and Opinions.

ELECTRICITY, by *Mr. Ottoguericke, Mr. Cuneus, Dr. Franklin, and Dr. Priestly.*

Mr. Hurrison's time-piece, in England,

Hadley's Quadrant, by an American.

Mr. Rittenbouse's Orrery, at Philadelphia.

Dr. Herschel's Astronomical Discoveries, viz. Georgium Sidus, with its two Satellites. Two moons of Saturn, the rotation of his ring, and spots in his body. Also the mountains in our moon, which are two miles high according to his telescope which magnifies 6500 times.

Air Balloons invented in France.

Dr. Priestly's Discoveries in the qualities of the air—in England.

The Hon. Baron Swedenborg's Theology.—Great-Britain.

The strange mode of worship adopted by the Shaking Quakers, in America.

A remarkable Iron Bridge, built over the river Severn, at Colebrooke-Dale, in the County of Salop, near Wales, in England: It contains about

500 tons of iron. The arch is 100 feet within, and 45 above the water the inside, but 55 the outside.

Animal Magnetism.

The American Constitution, framed by the Federal Convention, at Philadelphia.

The Albion Grist-mills, with 20 pair of stones, carried by a steam of fire, near Black Friar's-bridge, London. They have lately been burnt.

The *Radix Ginseng*, in Canada, Vermont, and Pennsylvania.

The Author's *Hypothesis* upon the cause of the *Aurora Borealis*, at Vermont.

Many islands, &c. discovered in the Southern Hemisphere, and other parts of the world, by *Capt. Cook*, and other Navigators.

Some remarkable *Springs*, or *Pits of Coal*, discovered in America.

A *Tide-table* invented by the *Author*, for the Sea Ports of the North American Continent.

The Constitution of France, framed by the National Assembly.

Needless compositions expunged out of the London and Edinburgh Pharmacopœias.

The Great Constitution of *Liberty* framed by the *Author*, at London.

Mr. Pope's remarkable *Orrery*, and also his *Hypothesis* upon the cause of the *Gravitation of Bodies*.

Mr. Walker's, *Transparent Orrery*. Westminster, London.

A new

A new *washing-mill*, London.

A curious iron bridge, to be placed over the Schuylkil, near Philadelphia, invented by *Mr. Thomas Paine*, in England.

A new *carriage*, with eight wheels, drawn by three horses, that will carry 14 people, he inside, Westminster, London.

The *Author's Hypothesis*, upon the cause of the wonderful operation of the *Magnetical Effluvia* in the human frame, &c. Let us endeavour to make further discoveries.

C H A P. LXIV.

How to preserve our Health when it is present and Restore it when it is absent, and make ourselves happy in this World, and the next.

I COME now to the grand and important things, which I have proposed, viz. How to preserve our health when it is present, and restore it when it is absent, and also how to make ourselves happy in this world, and the next,

I shall therefore recommend 1. A good house, situated in an agreeable neighbourhood, where there is a wholesome air, and good water.

2. Good cloathing, and a suitable diet, free from all kinds of filthy and poisonous things.

3. Industry, gentle exercise, and temperance.

4. When our health is impaired let us employ the best physicians, and take the best remedies.

5. A contentment with the allotments of Providence, through all the various changing scenes of life.

6. A strict observation of the *things* contained in the *American Oracle*, and especially those mentioned

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tioned in the *Epistle* of the *Author* to all *People*, *Nations* and *Languages*.

Finally, let us worship the *Creator*, live *peaceably*, and walk *honestly*, for it comprehends all the duties that are required of rational creatures. *Farewell*.

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