sale devourer of books, while at school at Meissen, translated the third and fourth books of Euclid, and drew up a history of mathematics; and when leaving school, at fifteen, he delivered a discourse—"De Mathematica, Barbarorum." He eventually withdrew from mathematics and devoted himself to belles lettres.

Francis Bacon was somewhat precocious. Being delicate in health as a boy, he was thrown upon himself and became sedentary and reflective. At twelve, the sight of a juggler playing tricks with cards led him to study the art of legerdemain. He entered Trinity College, Cambridge, at thirteen, and left it at sixteen to enter upon his travels. It has been said that he planned his *Novum Organum* at Cambridge, but of this no special proof exists. At nineteen he published his work, *Of the State of Europe*, showing, amongst other things, accurate observation and considerable penetration. While studying for the bar, to which he was called at twenty-one, Bacon sketched the plan of his *Organum* in a piece which, in his youthful pride and perhaps prophetic forethought, he designated *The Greatest Birth of Time* (Partus Temporis Maximus); but the great work itself was not published until his fifty-ninth year. In the meantime, he had published numerous works—amongst others, his *Essays and Counsels*, at the age of thirty-six; and his *Advancement of Learning*, at forty-five, when he was immersed in business as a member of Parliament and a barrister in full practice.

Another of the greatest young philosophers of the seventeenth century was Sir Christopher Wren, though he is chiefly remembered as a great architect. Like Pascal and others, he was weakly and precocious as a boy, exhibiting not only much poetic feeling and fancy, but displaying a remarkable taste for abstruse science and philosophy. As early as thirteen he invented an astronomical instruments

which he dedicated to his father in Latin rhyme, as wel as a pneumatic engine, and another instrument "of use in pneumonics."* At fourteen, Wren was admitted gentleman commoner at Wadham College, Oxford, and afterwards as isted in the early meetings of scientific men, which led to the foundation of the Royal Society. When Evelyn visited Oxford in 1654, he says, "I saw that miracle of a of a youth, Christopher Wren." And a miracle indeed he was; studying and demonstrating anatomy at twenty-two, appointed Gresham Professor of Astronomy at twenty-five, and making one invention and discovery after another to the number of fifty-three.† Amidst his various studies he gave much attention to the study of architecture, in theory as well as practice. It was because of his reputation in this respect that, at the age of thirty-one, he was commissioned to survey and report upon St. Paul's with a view to the restoration or reconstruction of the Cathedral. This circumstance had the effect of giving an entirely new bias to his life; and from that time forward he devoted himself to architecture—his chief work being the rebuilding of St. Paul's, as well as the other churches which had been destroyed during the great fire of London. Unlike Pascal, Wren lived to a ripe old age, closing his career at ninety, when he was one day found by his servant apparently placidly asleep in his chair, but quite dead.

Many other instances of great young men of science might be given—such as of the sickly and precocious but brave Spinoza, who polished glasses for a living, to enable him to pursue the study of philosophy, almost before he had emerged from boyhood; of James Watt, who was a thinker from his cradle, and invented the condensing steam-engine, which has produced so great a change in the industry of the world, before he was thirty; of Goethe, who con-

* Weld, *History of the Royal Society*, i. p. 272. † *Ib.* i. p. 274.

ceived and partly executed his greatest works—and he was a scientific man as well as a poet—when he was a comparatively young man; of Sir William Rowan Hamilton, of Dublin, whom a recent writer has designated as one of those men of genius whose name "will be classed with those of the grandest of all ages and countries, such as Lagrange and Newton." Sir William acquired, at the age of thirteen, a considerable knowledge of not less than thirteen languages.

The celebrated French geographer D'Anville, was a boy of only twelve years old when the sight of a map determined his future pursuits. He began alone, and without assistance, to draw maps of all countries mentioned in the classics. He achieved so much excellence in his work that, at the age of twenty-two, he was appointed one of the king's geographers. In the course of his busy life he published one hundred and four maps of ancient, and one hundred and six maps of modern geography, besides numerous valuable geographical memoirs. He was accustomed to say of himself that he "had found a geography made of bricks, and left one of gold."

Although Linnaeus, at nineteen, was pronounced by his schoolmaster to be, if not a positive blockhead, at least altogether unfitted for the Church, for which his father had destined him, he had the good fortune to be born in a delightful spot on the banks of a lake surrounded by hills and woods and cultivated grounds. The beauty of nature, and the wonders of vegetation by which he was surrounded called his genius into action. He himself said of his youth, that he walked out of his cradle into a garden, and flowers became his passion. His father, finding that the boy was unsuited for divinity, sent him to college to study medicine; but young Linnaeus devoted his whole time to botany, and neither poverty nor misfortune ever moved him from his purpose. Buoyed up by enthusiasm, he determined to make a journey alone through Lapland, in the course of which he travelled over four thousand miles, mostly on foot, and he brought back with him about a hundred plants which had before been unknown and undescribed. The publication of his *Flora Lapponica* established his reputation as the first botanist of his age.

John Ray, the naturalist, whom Cuvier considered to be the founder of modern zoology, was the son of a blacksmith near Braintree. He received a good education, and worked his way to Catherine Hall, Cambridge, where, at twenty-three years of age, he was appointed Greek lecturer; and two years later he was selected as mathematical tutor to his college. But natural history and zoology received the greatest part of his attention and study. He travelled over the greater part of England, Wales, and Scotland, in pursuit of botanical and zoological information, always observing, always full of work, always indefatigable in his favorite pursuit. He says it took him ten years to arrange his *Catalogus Plantarum Circa Cantabrigiam* for publication. He continued his journeys and studies abroad; and he afterwards travelled all over the Low Countries—France, Germany, Switzerland, and Italy—everywhere observing and collecting facts for future publication.

The same early tendencies to study and close observation have distinguished the leading men in surgery and medicine. Ambrose Paré, the great French surgeon, was acting as stable-boy to an abbé at Laval, when a surgical operation was about to be performed on one of the brethren of the monastery. Paré was called in to assist, and proved so useful, and besides was so much attracted by the pursuit, that he determined to devote himself to the study of surgery, in the practice of which he afterwards became so eminent.

Sir Astley Cooper is said to have been determined to follow the same profession by the following circumstance.

A young man having been accidentally run over by a cart, his femoral artery was opened, and the youth was in danger of dying from loss of blood, when young Cooper had the presence of mind to tie his handkerchief above the wounded part sufficiently tight to stop the hæmorrhage. He was encouraged by the result, and determined to follow the profession of surgery in which he had obtained his early success.

M. Petit, the celebrated French surgeon, first attracted the attention of Littré, the great anatomist, by performing vivisection on a rabbit when quite a boy. From the age of seven he was a regular attendant on Littré's lectures. At the end of two years he had become so proficient in anatomy that the charge of the anatomical theatre in which the demonstrations were given was placed solely in his hands, and the remarkable sight was to be observed of a lad between nine and ten years of age, mounted on a chair, delivering lectures on anatomy, which were listened to with pleasure even by able professional men. He devoted himself to surgery with like passion, and soon became distinguished as one of the best surgical operators in France.

Blumenbach was another distinguished student of the history and constitution of man. He may be regarded as the father of ethnology. At ten years old he shut himself up with a manufactured skeleton—the beginning of his "Golgotha," as he afterwards called his anthropological collection—for the purpose of studying comparative osteology, with which he was then puzzled. The city of Gotha possessed only one real skeleton, which was the property of a physician, a friend of the Blumenbach family. He constantly visited the physician's house, for the purpose of studying his skeleton. At length he made an artificial fabric of his own from the bones of domestic animals, out of which, by a little manœuvring and patience, he contrived to manufacture a skeleton bearing some resemblance

to the human. This was the modest commencement of that osteological collection which afterwards became so famous all over Europe. At seventeen, Blumenbach went to Jena University, and at twenty to Göttingen. When he reached the age of twenty-three, he produced the first of his great works, *On the Natural Varieties of Mankind.*

Bichat was, even in his boyhood, an indefatigable worker. All that he accomplished was done in the course of only a few years, for he died at thirty-two. Buckle has said of his great work, *Anatomie Generale*, published the year before his death, that it "embodies probably the most valuable contribution ever made to physiology by a single mind." He investigated the laws of sensation and irritability, and displayed equal devotion to physiological science, studying more particularly the tissues, with a view to ascertaining the laws of their normal and pathological development. Pinel, in his memoir of Bichat, observes: "Dans un seul hiver il ouvrit plus de dix cent cadavres. . . . L'esprit a peine à concevoir que la vie d'un seul homme puisse suffire à tant pe travaux, à tant de découvertes, faites ou indignées: Bichat et mort avant d'avoir accompli sa trente-deuxième année!" *

Boerhaave, the great physician, translated Greek and Latin at eleven, and delivered an eloquent oration before the Professor of Greek at twenty, taking the degree of Doctor of Philosophy in the following year. Sir Humphrey Davy made so much progress in chemistry when a boy, though completely unaided, that at twenty he was appointed to take charge of the Pneumatic Institution at Bristol. Dr. Jenner, before his twentieth year, contemplated the possibility of removing from the list of diseases one of the most loathsome and fatal that ever scourged the human race, and in the long run he triumphantly succeeded.

* *Anat. Gen.* i. pp. 13, 16.

Dr. Richard Owen, the distinguished naturalist, very narrowly escaped on two occasions the career in which he has since become so famous. In the first place he was sent to sea, and served as a midshipman on board the *Tribune*. But the American war having terminated, his ship was paid off, and on his return home he became apprenticed to a surgeon at Lancaster. He was sent to Edinburgh, where he studied under Dr. Barclay, and acquired a taste for comparative anatomy. He removed to St. Bartholomew's Hospital, London, where he attracted the notice of John Abernethy, the well-known surgeon, and assisted him in the dissecting-room. He obtained his diploma as surgeon, but as there seemed to be no opportunity for advancing himself in his profession, he bethought himself of again going to sea. He obtained an appointment as assistant-surgeon, and went to take leave of his eccentric friend and master. "What is all this about?" said Abernethy; "where are you going?"—"Going to sea, sir."—"Going to sea? Going to the devil!"—"I hope not, sir."—"Going to sea! You had better, I tell you, go to the devil at once," reiterated glorious John, dwelling on the temptations, the difficulties, the loss of time and fame that must be the result of so rash a step, and insisting on another interview after the pause of a week. Owen revisited his rough but downright friend at the expiration of that time, when Abernethy proposed an appointment at the College of Surgeons. This was accepted; the youthful anatomist found himself happily associated with a man of congenial mind, and though the navy lost a good officer, science gained one of its brightest ornaments.

In literature and languages, as might be expected, the instances of early display of great powers are equally numerous. When Melancthon was only twenty he gave public lectures at Tübingen on Virgil, Terence, Cicero, and Livy;

and at twenty-one he was appointed Professor of Greek in the university of Wittenberg. Montesquieu sketched his *Esprit des Lois* before he was twenty. Fénelon made such rapid progress in his studies that at fifteen he preached a sermon before a select assembly at Paris. Gresset wrote *Ver Vert*, one of the wittiest productions in the French language, when he was in his twenty-fourth year. Villemain's reputation for talent was such that at nineteen he was apppointed Professor of Rhetoric at the College Charlemagne at Paris, and two years later his *Eloge de Montaigne* was crowned by the Institute of France. Cousin carried off the prize of honor at the same Institute in his sixteenth year, and Auguste Comte gained the first place for mathematics in the Ecole Polytechnique at the same age.

Beckford wrote *Vathek* at twenty-two. "I wrote it," he says, "at one sitting, and in French. The 'Hall of Eblis' was my own fancy. All the females mentioned in *Vathek* were portraits of those in the domestic establishment of Old Fonthall, their imaginary good or ill qualities exaggerated to suit my purpose." Dr. William Wotton showed an extraordinary faculty for learning languages when a boy. At five he could read and translate Latin, Greek, and Hebrew. When ten he knew Chaldaic, Syriac, and Arabic. When appointed to a living in Wales he acquired a command of Welsh, but like Magliabechi, who had a much more extensive knowledge of languages, he never did anything else but acquire them. He did not leave a single thought for the benefit of others. The precocity of both proved failures.

It was different with Sir William Jones, who was considered a remarkable boy, even when at school. His father was a mathematician of eminence, but died when the boy was only three years old. At Harrow young Jones surpassed all his schoolfellows in learning. Dr. Thackeray,

the headmaster, said of him: "If Jones were left naked and friendless on Salisbury Plain, he would nevertheless find the road to fame and fortune." Every reader knows of Sir William Jones's achievements.

Sir James Mackintosh, from whom so much was expected when young, proved a "man of promise" to the end. His name used to be mentioned in the neighborhood of Fortrose, to which he belonged, as a prodigy of learning. But he never had the leisure—perhaps never the perseverance—to be great. He was incessantly resolving, and then reposing from the fatigues of inventing resolutions. When a boy he would read and think half the night, and when a man he would read and think perpetually; but he never fulfilled the great promises which had been formed of his brilliant career.

Thomas Brown, the metaphysician, was only about eighteen when he wrote and published his *Observations on Darwin's Zoonomia*, the preface to which contained the germ of his doctrine of causation. Dr. Brown was eventually appointed Professor of Moral Philosophy in the University of Edinburgh, and his lectures, which were published after his death, are considered to be the best text-book on the subject. Dr. Brown was a contributor to the *Edinburgh Review* in his twenty-fourth year. That quarterly was founded and conducted mainly by young men —by Henry Brougham at twenty-three, Francis Horner at twenty-four, Francis Jeffrey at twenty-nine, and Sydney Smith—who, as a boy, was a leader of learning as well as of mischief—at thirty-one.

Dr. Alexander Murray, when a shepherd boy, was considered by his father to be both stupid and lazy. He was always committing some blunder or another when sent to herd the sheep or bring the cattle home. One reason was, that the boy's head was turned upon learning far more than upon grazing. By fifteen, he contrived to teach himself Latin and French, and was soon able to read Cæsar, Ovid, and Livy. He left herding, and became a tutor; learning, in his leisure hours, German, Anglo-Saxon, and Visigothic, after which he digressed into Welsh. In the course of a few years he mastered the whole of the European languages, and began his researches into the more recondite dialects of the East. At the age of thirty, he was acknowledged to be one of the most accomplished linguists of his age; and on a vacancy occurring in the chair of Oriental Languages at Edinburgh, he was appointed Professor at the age of thirty-six. But the brain-work to which he had for so many years subjected himself, proved more than his weakly constitution could bear, and he only enjoyed the honor for a year, dying at the early age of thirty-seven.

It has sometimes been assumed that boys who distinguish themselves at school and college fail to distinguish themselves in actual life. "How few," said Sir Egerton Bridges, "of those who take honors at the universities are ever afterwards heard of."* This, however, is by no means the case. Those special qualifications which ensure future eminence really begin to show their existence and vitality at the ages of from seventeen or eighteen to between two or three-and-twenty. The reasoning faculty then begins to assume its place in the mental organization, and the gift of understanding things, as well as of knowing them, gives a new form and color to all that passes through the mind. Hence the young men who come to the front at school and college generally come to the front in the school of actual life. Take, for instance, the lives and history of a few of our most eminent statesmen.

Lord Chatham, Charles James Fox, Windham, Gran-

* *Autobiography*, i. pp. 65, 66.

ville, and Wellesley, were distinguished Etonians. Chatham did not particularly distinguish himself at Oxford. In his twentieth year we find him a cornet in the Blues. At twenty-six he entered Parliament, and two years later he delivered his first speech, which at once attracted attention. "That terrible cornet of horse," is said to have given Sir Robert Walpole a pain in the back whenever he rose to speak; for he was one of the most impassioned and inspired of orators. Very different was William Pitt, the "heaven-born minister"—though to have been the son of such a father was a fact of no mean significance in the heraldry of his intellect and character.

Young Pitt was weak and delicate but precociously clever. He was brought up at home, and educated mainly by his father. Lady Holland said of the "little William Pitt" that he was "really the cleverest child she had ever seen."* At twelve he left his brother, who was three years older, far behind him. His father used to set him up on a chair to declaim before a large company, greatly to their surprise and admiration. At fourteen he wrote a tragedy in five acts. Before he had completed his fifteenth year he was entered a student at Pembroke Hall, Cambridge. He remained there for six years, was an assiduous student, and read extensively in English literature. Macaulay says that his knowledge, both of the ancient languages and of the mathematics, was such as very few men three years older than himself then carried up to

* Lord John Russell, in his *Memorials of Charles James Fox* (who was ten years older than Pitt) gives the following anecdote :— "The Duchess of Leinster related to me a conversation, at which she was present, between her sister, Lady Caroline, and Mr. Fox (Lord Holland). Lady Caroline, in expostulating with her husband on his excessive indulgence to his children, and to Charles in particular, added, 'I have been this morning with Lady Hester Pitt, and there is little William Pitt, *not eight years old*, and really the cleverest child I ever saw, and *brought up so strictly and so proper in his behavior*, that, *mark my words*, that little boy will be a thorn in Charles' side as long as he lives.'"

college. The work in which he took the greatest delight was Newton's *Principia*; and the readiness with which he solved difficult problems in mathematics was pronounced by one of the moderators to be unrivalled in the University.

Pitt entered Parliament as soon as he came of age. At twenty-two he made his first speech, in support of Burke's plan of economical reform, and he delighted not less than astonished the House by his selfpossession, his readiness of delivery, and his noble bearing. Hazlitt said of him that "he was always full grown, and had neither the promise nor the awkwardness of a growing intellect." At twenty-three, Pitt was appointed Chancellor of the Exchequer, and at twenty-four Prime Minister,—"the greatest subject," says Macaulay, "that England had seen during many generations."

Though Edmund Burke was not so precocious as Pitt, he obtained prizes at Trinity College, Dublin, especially for classics. He devoted most of his spare time to general reading, more especially to works on history—the future weapon of his strength. In his twenty-sixth year he published his *Essay on the Sublime and Beautiful*, begun at nineteen, which immediately secured for him a position among the classic authors of his country.

Canning, one of the most brilliant of Eton scholars, acquired an early distinction from the elegance of his Latin and English poetry. At the age of seventeen he started his *Microcosm*—a periodical, the principal contributors to which, besides himself, were Frere and the brothers Smith, of about the same age. Canning entered Christ Church College, Oxford, in his eighteenth year, and distinguished himself by his classical performances. His *Iter ad Meccam*, which was recited in the theatre on the occasion of Lord Crewe's anniversary commemoration, transcended all competition, and was pronounced to be the best Latin poem

Oxford had ever produced. Canning entered Parliament at twenty-three; made his first speech in the following year; was appointed Under-Secretary of State in his twenty-sixth year; and rose through offices of increasing importance until his fifty-seventh year, when he became Prime Minister, in the possession of which office he died.

Of later statesmen. Peel and Gladstone have both taken high honors at Oxford. Peel took his degree of B.A in his twentieth year with unprecedented distinction, being the first who took the honors of a double first-class in classics and mathematics. The same feat was, however, afterwards accomplished by Mr. Gladstone, Lord Cardwell, and Lord Westbury.

Lord Macaulay's career at Cambridge was eminently distinguished. In two consecutive years, when nineteen and twenty respectively, he carried off the Chancellor's medal for English poetry, and in his twenty-second year he gained the Craven Scholarship. Although university prize poems have no special reputation, their authors have often been distinguished men. Mackworth Praed took the Chancellor's medal in two successive years after Macaulay, besides being Browne's medallist for Greek ode and epigrams. Bulwer Lytton afterwards gained the same medal for his poem on "Sculpture." Amongst those who gained prizes for poems at Oxford and Cambridge were the Rev. W. L. Bowles, Bishop Heber. Professor Whewell, Dean Milman, and Lord Tennyson.

It has been observed that it is not the men who take the first rank at the universities who take the first rank in actual life, but oftener the men who take the second and even the third rank. Take, for instance, the Mathematical Tripos at Cambridge, and it will be found that while many of the senior wranglers take high positions as professors, teachers, translators, and occasionally rise to high positions in the church, they do not, as a rule, take the lead in the professional and scientific world. Many of them entirely

disappear from public sight. Take the period from 1739 downwards, and we find the following senior wranglers of distinction: Sir John Wilson, Judge of Common Pleas, 1761; Dr. Paley, 1763; Dr. Milner, Dean of Carlisle, 1774; Sir Joseph Littledale, Judge in the Queen's Bench, 1787.

A great run of legal senior wranglers began with the present century. In 1806, we find the name of Pollock, afterwards Lord Chief Baron; in 1808, Bickersteth, Lord Langdale; in 1809, Alderson, Baron of Exchequer; in 1810, Maule, Judge of Common Pleas; while Platt, Baron of Exchequer, was fifth junior optime in the same year. Among the other judges of minor grade, were Sir R. Graham, Baron of Exchequer, who was the third wrangler of his year; Lord Alvanley, Chief Justice of Common Pleas, who was the twelfth. Lord Ellenborough, Sir S. Lawrence, Lord Lyndhurst (who was second), Sir John Williams, Sir N. C. Tindal, Sir L. Shadwell, Lord Wensleydale, Sir T. Coltman, Lord Cranworth, Sir Cresswell Cresswell—all of whom, though they took honors, were not of the first distinction in their respective years. Lord Hatherby, Lord Selborne, and Lord Coleridge also took high honors at their respective universities. Professor Whewell was second wrangler, and Professor Sedgwick fifth.

Among the few scientific men who came out senior wranglers were Sir John Herschell, Professor Airey, Professor Stokes, and Professor Adams—the fellow-discoverer, with M. Leverrier, of the planet Neptune. The Earl of Rosse, the great mechanic of the peerage, graduated first-class in mathematics at Magdalen College, Oxford; but the Honorable J. W. Strut, eldest son of Lord Rayleigh, who came out senior wrangler at Cambridge in 1865, is said to have been the first nobleman's son who has ever achieved this distinction.*

* *Times*, 1st February, 1865.

A few words in conclusion as to the Great Young Men of history. Although it does not often happen that men are placed in command until they have acquired the experience which usually comes with age, it has nevertheless happened that some of the greatest rulers and commanders in ancient and modern times have been comparatively young men. Genius for command seems to have come like instinct, and it is genius for any pursuit that alone gives a passion for it.

Themistocles as a youth was fired by the love of glory, and longed to distinguish himself in the service of his country. When only about thirty he led the Greek fleet in the sea fight with the Persians under Xerxes at Salamis. The complete victory which ensued was due to the valor of all, but chiefly to the sagacity and persistent bravery of Themistocles. He stood the first in worth as in command, and his compatriots for a time acknowledged his greatness and supremacy.

Alexander the Great was a still more precocious ruler and general. He was no sooner called to the throne of Macedonia, at twenty, than he was called upon to put down a formidable insurrection. In this he completely succeeded, after which he marched southward and subjected the principal states of Greece. In his twenty-second year he assembled an army for the invasion of Persia, crossed the Hellespont, and landed at Abydos. He met the army of Darius on the banks of the Granicus and completely defeated it. In the following year he advanced into Asia Minor, fought and won the battle of Issus, and, two years later, the battle of Arbela, when he was only twenty-five years old. The power of Darius was thus completely broken, the East was laid open to the arms of Alexander, and during his reign of twelve years and eight months he extended his empire from the coasts of the Mediterranean to the eastern tributaries of the Indus. He died at the age of thirty-one.

Scipio and Pompey were both great in youth. Scipio won the battle of Zana when he was twenty-nine; but Pompey distinguished himself at an earlier age. At twenty-three he raised and commanded the army with which he defeated Marcus Brutus. In the following year—while a mere "beardless youth," as his enemies described him—he made a successful campaign into Africa, and returned in triumph to Rome.

Hannibal was one of the greatest young generals of antiquity, having been bred to war in the camps of Hamilcar and Hasdrubal. At the death of the latter, when Hannibal was only twenty-six, he succeeded to the sole command of the Carthaginian army. After conquering the Spanish tribes who still remained unsubdued, he turned his arms against Rome. In his twenty-eighth year he took Saguntum, after an eight months' siege; then crossed the Pyrenees, advanced to the Rhone, penetrated into Italy through the Alps, and after several successful engagements, fought and won the great battle of Cannæ, when in his thirty-first year.

In the Middle Ages, Charlemagne and Charles Martel were both great warriors in early life. Martel, "The Hammer," as he was called, defeated the Saracens at Tours when a comparatively young man, and thus changed the fate of Europe. Charles the Great, at thirty, was master of France and Germany. Next to Alexander the Great and Cæsar, his was the greatest name in early European history. William the Conqueror, when only twenty, defeated his rebellious nobles at the battle of Val de Dunes; and at thirty-eight he won the victory at Hastings which made him master of England. Edward the Black Prince, when only sixteen, commanded the main division of the English army at the battle of Crecy. When his father saw him rushing into the thick of the fray, he said: "Let the child win his spurs, and let the day be his." At the end