**Galileo.**

(*Concluded.*)

Galileo was scarcely free from the fangs of the Inquisition, than his innate love of truth, and abhorrence of a system which set the erring judgement of men superior to the dictates of reason and phenomena of nature, prompted him to repeat his offence. In 1618, he communicated to the archduke Leopold his theory of the tides; and, in doing so, alluded, in sarcastic terms, to the proceedings of the church. The same spirit pervaded others of his writings. In 1632, he published a work, under the title of "The System of the World of Galileo Galilei," demonstrating the Copernican theory. To shield himself from Inquisitorial persecution, he adopted a system of dialogue, in which three assumed characters are exhibited in debate upon the respective systems. One of these takes up, and defends the system of Copernicus; another suggests doubts and difficulties; and the third stands up for the system of Ptolemy. This work attracted great notice, and the church having committed itself by denouncing the new doctrines, at once laid on its strong arm to crush the audacious innovator on its dogmas.

Proceedings were immediately adopted to summon Gallileo again before the Inquisition. Representations were made through the Tuscan ambassador at the papal court, to obtain a written statement of the charges, that Galileo might prepare for his defence. This, however, was refused, and a summons was soon issued for him to appear at Rome. At this time a contagious epidemic was raging in Tuscany, and a strict quarantine was enforced at Rome. Representations were made of the miseries which a journey under these circumstances would impose upon Galileo, who at the time was suffering from advanced age and ill health. Personal attendance was however peremptorily demanded. Some respect was certainly paid to the talents and infirmities of Galileo during the progress of his trial. He was allowed to reside in the palace of the Tuscan ambassador, and even permitted to visit the public gardens.

~~On the 22d of June, 1633, the Inquisitors~~ assembled to pronounce sentence on the philosopher. From passages in the sentence, it is suspected that Galileo, was put to the torture. This sentence itself is too long for insertion; but the following extract will convey an idea of its nature.

"By the desire of his Holiness, and of the most eminent Lords Cardinals of this supreme and universal Inquisition, the two propositions of the stability of the sun 'and the motion of the earth were qualified by the theological qualifiers as follows:

1st. "The proposition that the sun is the centre of the world, and immovable from its place, is absurd, philosophically false, and formally heretical; because it is expressly contrary to Holy Scripture.

2d. "The proposition that the earth is not the centre of the world, nor immoveable; but that it moves and also with a diurnal motion, is absurd, philosophically false; and theologically considered, at least erroneous in faith.

"We decree that the book of the Dialogues of Galileo and Galilei be prohibited by edict; we condemn you to the prison of this office, during pleasure, we order you for the next three years to recite once a-week the seven penitential psalms."

Had Galileo stood up boldly in defence of his opinions, he might not perhaps have disarmed the persecuting spirit of the Inquisitors, but he might have confounded their accusations, and either stood the free champion of truth, or fallen the proud martyr of science. He had observation and experience on his side against which no one could shut his eyes; he had arguments to advance which could neither be eluded nor contradicted; and more, he had the precedent of the church itself acknowledging, and in a manner patronizing the very opinions for holding which they were persecuting him. At the very moment that he stood clothed in penitential sackcloth before the bar of the Inquisition, the work of Copernicus (himself a catholic priest), dedicated to the Pope, stood in the library of the Vatican; and in the very year of Galileo's first persecution, a work was issued by a Carmelite monk at Naples, upholding the same opinions, and its author never called in question. By confessing to the charges of the Inquisition, Galileo in a manner justified its proceedings. And, however detrimental it may have been to the interests of science, however degrading to the spirit of humanity, we must look upon the ancient philosopher with a kindly eye. He lived in a time when the mind of society was bound down in reverence and fear to the dictates of the church. His expanded mind might in its vigor have braved persecution, and even death, before perjuring himself in the eyes of the world. But old age had laid its withering hand upon him; physical suffering had broken down his frame; and, dreading to sigh out his few remaining days in the lonely dungeons of the Inquisition, he quailed before the dread power of that fearful institution, and passively renounced, in words, those opinions which he knew to be true, and which the progress of science has since demonstrated. On his knees, and with his hand upon the Scriptures, he solemnly abjured the opinions he had taught.

"With a sincere heart and an unfeigned faith, I abjure, curse, an detest, the said errors and heresies, (viz., that the earth moves, &c.) I swear that I will never in future say or assert anything, verbally, or in writing, which may give rise to a similar suspicion against me.

"I, Galileo Galilei, have abjured as above with my own hand."

Rising from his knees, Galileo, it is said, stamped with his foot upon the ground, and whispered to a friend, "It does move though."

Immediately on the ceremony being concluded, Galileo was conducted to the prisons of the Inquisition. The abjuration and sentence were publicly read to the principal universities. After four days' confinement, the interest of the Duke of Tuscany procured his liberty to reside under surveilance in the house of the Tuscan ambassador, from whence he was shortly removed to the palace of the archbishop Piccolomoni at Sienna. Here he resided six months, and was kindly treated; he was then permitted to return to his own home, near Florence; still, however, under restraint. Shortly after returning home, Galileo suffered ~~great affliction from the loss of his favorite~~ daughter. From 1634 to 1638, during nearly the whole of which time he suffered greatly from ill health—every application for a remission of his sentence was rejected.

In 1638, he obtained leave to visit Florence, for the benefit of his health; but under such strict terms, that he dared neither visit his friends nor admit them to his house, and required even a special order to be allowed to attend mass. From 1633 to 1638, Galileo, who applied himself as closely to study as his health would permit, composed his "Dialogues on Local Motion." So fearful were his enemies that the true spirit of the philosopher might again break out, that a licence was not granted for its publication, and it had to be printed in Holland.

About 1636, Galileo discovered the moon's diurnal and longitudinal liberation. This was his last telescopic discovery. He had for years been afflicted with disease in the right eye; in 1637, his left was also attacked, and in a few mouths the bodily eyes of the philosopher were darkened forever. After publishing his Dialogues on Motion, he renewed his attempts to introduce his system of finding longitude at sea. He made offers to the Dutch government, who appointed commissioners to investigate the subject. This correspondence ended in nothing. Galileo was presented with a golden chain as a token of respect; and after his blindness, one of his pupils undertook to arrange and complete his calculations and observations. All parties engaged in this matter died before it could be brought before the world. This, however, is the less to be regretted; for the method proposed has never yet been found answerable to the desired purpose.

After Galileo had become blind, the Inquisition exercised a little more lenity towards their victim. Many eminent men of the day visited him, amongst whom was our countryman, Milton. He projected a continuation of his Dialogues on Motion; but, while preparing it, he was seized with his last illness, and in two months the spirit of the injured philosopher was removed from the enmity of his persecutors.

Not content with striking him down while living, the vengence of the Inquisition followed Galileo even in death. His right to make a will, and of being buried in consecrated ground, was disputed; and although these were withdrawn, his friends were prohibited from erecting a monument over his remains, and his body lay in an obscure corner of the church. In 1737, his body was exhumed and re-interred under the splendid monument which now covers it. On this monument is a bust of Galileo, and figures of geometry and astronomy. His house at Arcetri, about a mile from Florence, still remains, an interesting relic to lovers of science.

**Lowell Machine Shop.**

MESSRS. MUNN & Co.—I see in your last paper a short article headed "A Great Machine Shop," stating that the Lowell Machine Shop can furnish machinery complete for a mill of 600 spindles in three months. I presume you made a mistake in the number of spindles, for it should be 6000 spindles, and I think 8000 would not be far out of the way. I presume that you do not know the extent of business done in the Lowell Machine Shop, nor indeed can any one know until they visit it, and even then it is doubtful whether they find all the holes and corners that are filled with machinery. In addition to their cotton machinery, they are building locomotives, stationary engines, tools of all descriptions, and in fact all kinds of machinery now in use in this section of country. They have employed from six to seven hundred hands for the last three years.

In addition to the present shops they have the foundation laid, and wheel pits and penstocks in for another shop, to exceed any thing of a machine shop in magnitude in this country. It is to be 400 feet long, 160 wide, 3 stories high, covering nearly 1½ acres of ground and in connection with this there is to be a Smithy 200 feet by 65 feet, 20 feet story.

Your Respectfully, * * *.

*Lowell, March* 5, 1849.

Our correspondent is correct in reference to our mistake, it was a typographical one. The ~~Lowell Machine Shop has the name of being~~ the greatest on this continent.

**Salt in Syracuse.**

The origin of the salt water from which the immense quantities of salt are made in Syracuse, is a vast bed of rock salt underground, which is gradually dissolved by water. The rain which rushes down the hills about Syracuse, and soaks through to the region of Salt, comes up again in springs charged with this valuable article in a convenient state for the process of manufacture. The salt water is worth more than the rock salt itself; for rock salt cannot be purified without first dissolving it, which is so much extra work. Thus in a single year, a large mass of rock salt, or salt rock, of at least equal size with the bulk of the manufactured article, is delivered from the earth by the silent but mighty workings of nature. But how will the face of the ground be affected by the removal of vast masses of rock from its foundation? It is manifest that a great cavity is forming there. If each year takes out over six millions of cubic feet, a block for instance in the shape of a cone or pyramid and this is continued for a series of years, the result must be an immense chasm—which might easily swallow up Syracuse and its suburbs. The growth of this cavern in any number of years is readily computed; but it is not easy to calculate how long the heavy masses of earth, soil and materials above the chasm, will maintain their position undisturbed by the progressive waste of their foundation.

**Analysis of Impure Air.**

Lessaigne has examined the nature of the Air of those places where men were living in a crowded state, and where there was hardly any communication with the external atmosphere. The results obtained were almost invariably the same. Of 100 volumes of the air there were 79.35 to 80 10 azote, 19.36 to 20.10 oxygen, 0.62 carbonic acid. The air near the ceiling contained as much carbonic acid as that near the floor.

Grager, of Muhlhausen, ascertained the proportion of ammonia contained in the atmospheric air, by allowing the latter to pass through hydrochloric acid, and binding it thus to platina. He found that 1.06 cubic metres at 0° C. contained 0.0008466 grammes of carbonate of ammonia, or that 100,000 parts of atmospheric air contained 0.6148, that is, three-fifth millionths of carbonate of ammonia. An inquiry on rainy days and in dry weather was attended with the same results.

**LIST OF PATENTS.**

**ISSUED FROM THE UNITED STATES PATENT OFFICE,**

*For the week ending March* 13, 1849.

To Jeremiah Warner, of Reading, Pa., for improvement in Cultivators. Patented March 13, 1849.

To Willis Pratt of Springfield, Mass. for improved horizontal Spark Arrester. Patented March 13, 1849.

To Thaddeus Fairbanks, of Johnsburg, Vt. for improvement in Double Scale Balances. Patented March 13, 1849.

To Robert B. Goodyer, of Philadelphia, Pa., for improvement in apparatus for operating Shuttle boxes of Looms. Patented March 13, 1849.

To Alfred B. Leymore, of N. Y., for improved combined Railroad Bar. Patented March 13, 1849.

To Henry Mallow, of Pendleton Co. Va., for improvement in regulating Firebays. Patented March 13, 1849.

To John McGinley, of Philadelphia, Pa. for improvement in Spring Shanks for Boots and Shoes. Patented March 13, 1849.

To Robert Eastman, of Concord N. H., for improvement in Balances for weighing. Patented March 13, 1849.

To William J. Johnson, of Mobile, Ala., for improvement in Cotton Presses. Patented March 13, 1849

To Benj. Morrison, of Harrisburg Pa., for improvement in Rope Machinery. Patented March 13, 1849.

To George E. Waring, of Stamford, Conn., for improvement in Cooking Stoves. Patented March 13, 1849.

To Andrew Hotchkiss of Sharon, Conn., for improvement in Curry Combs. Patented Mar. 13, 1849.

~~To Wm. T. Sprouse, of Petersburg, Ill.,~~ for improvement in Ploughs. Patented March 13. 1849.

To Seth Boyden, of Newark, N. J., for Improved Furnace for Smelting Zinc. Patented March 13. 1849.

To Wm. Beach of Philadelphia, Pa., for Improvement in Curry Combs. Patented March 13. 1849,

To F. P. Dimple, of Philadelphia, Pa., for improvement in Smoke consuming apparatus. Patented March 13, 1849.

To William Harris, of Fayette, N. Y., for improvement in Grain Gatherers. Patented March 13, 1849.

To S. M. Pye, of Aquackanock, N. J., for improved Door Lock. Patented Mar. 13, 1849.

To D. Barnum & T. S Wells, of New York, for improvement in Planing Machines. Patented March 13, 1849.

To E. B. Bigelow, of Boston, Mass., for improvement in Looms for weaving Brussels Carpeting &c. Patented March 13, 1849.

To Andrew McCleary, of Philadelphia Pa, for improved Spiral Spark Arrester. Patented March 13, 1849.

To J. Johnson & J. D. Snyder of Saltsburg, Pa. for improvements in apparatus for dressing cloth. Patented March 13, 1849.

To H. B. Lawton and H. L. Lawton, of New York City, for improvement in Cotton Batting. Patented March 13, 1849.

To H. W. Sabin & L. B. Benton, of N. Y., for improvement in apparatus for raising and tilting Water Buckets. Patented March 13, 1849.

[This list arrived from the Patent Office after our first form had gone to press.

**Enormous Cheese.**

The London papers mention the arrival there of an enormous cheese. The milk of seven hundred cows was used in making it, and it weighs 1,474 pounds. It is thirteen feet in circumference, four feet and a quarter in diameter, and eighteen inches in thickness. It was made by Messrs. Austin & Stone, farmers of Austinburgh, Ohio, United States of America, and was offered for and obtained a prize in New York.