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An Appalling Discovery by Scientists The United States, with Five other Governments, Secretly Combine.

THE EARTH'S CRUST BROKEN.

An Artificial Volcano Bursts Forth, Overwhelming Whole Villages.

Northern Europe Threatened with Inundation.

Uncle Sam Pays \$87,000 as his As- sessment.

A REMARKABLE REPORT.

[From the S. F. Chronicle.]
We have received the following document which purports to be a report prepared by the United States Consul at Bruges, in Belgium. It is singular that no telegraphic mention of so startling an occurrence has been made. The report is one that will excite the deepest interest, and, although not vouching for its correctness, we herewith present it to our readers. Nothing of a more startling nature than the events described ever occurred in the world's history:

GEN. FLAXAGAN'S REPORT.

Before proceeding to detail the actual state of affairs at Duzzele, near the line of canal connecting Bruges with the North Sea, it may not be out of place to furnish a succinct history of the origin of the exploration out of which the present alarming events have arisen. It will be remembered by the State Department that during the short interregnum of the Provisional Government of France, under Lamartine and Cavaignac in 1848, a proposition was submitted by France to the Government of the United States, Great Britain and Russia, and which was subsequently extended to King Leopold of Belgium, to create an "International Board for Subterranean Exploration" in furtherance of science, and in order, primarily, to test the truth of the theory of

IGNEOUS CENTRAL FUSION.

first propounded by Leibnitz, and afterwards embraced by most of contemporary geologists; but also with the further objects of ascertaining the magnetic condition of

THE EARTH'S CRUST.

The variations of the pole at great depths, and finally to set at rest the doubts of some of the English mineralogists concerning the permanency of the coal measures, about which considerable alarm has been felt in all the manufacturing centers of Europe.

The protocol of a quintuple treaty was finally drawn by Professor Henry of the Smithsonian Institute and approved by Sir Roderick Murchison, at that time President of the Royal Society of Great Britain. To this project Arago lent the weight of his great name, and Nesselrode affixed the approval of Russia—it being one of the last official acts performed by that veteran statesman.

The programme called for annual appropriations by each of the above named powers of 100,000 francs (about \$20,000), the appointment of Commissioners and a General Superintendent, the selection of a site for prosecuting the undertaking, and a Board of scientific visitors, consisting of one membership from each country.

It is unnecessary to detail the proceedings for the first few months after the organization of the Commission. Professor Watson of Chicago, and the author of a scientific treatise called "Prairie Geology," was selected by President Fillmore as

THE FIRST REPRESENTATIVE OF THE UNITED STATES;

Russia sent Olgokoff; France, Arago Jemie; England, Sir Edward Sabine, the present President of the Royal Society; and Belgium, Dr. Sechil, since so famous for his spectroscopic observations on the fixed stars. These gentlemen, after organizing at Paris, spent almost an entire year in traveling before a site for the scene of operation was selected. Finally, on the 10th of April, 1849, the first ground was broken by actual work, at Duzzele, in the neighborhood of Bruges, in the Kingdom of Belgium.

The considerations which led to the choice of this locality were the following: First, it was the most central, regarding the capitals of the parties to the Protocol; secondly, it was easy of access and connected by rail with Brussels, Paris and St. Petersburg, and by line of steamers with London, being situated within a short distance of the mouth of the Hound or West Scheldt; thirdly, and perhaps as the most important consideration of all, it was the seat of the deepest shaft then in the world, namely, the old salt mine of Duzzele, which had been worked from the time of the Romans down to the commencement of the present century, at which time it was abandoned, principally on account of the intense heat at the bottom of the excavation, and

which could not entirely be overcome except by the most costly modern scientific appliances.

There was still another reason, which in the estimation of at least one member of the Commission, Professor Watson, overrode them all—the exceptional increase of heat with depth, which was its main characteristic.

THE SCIENTIFIC FACTS

Upon which this great work was projected may be stated as follows: It is the opinion of the principal modern geologists, based primarily upon the hypothesis of Kant (that the solar universe was originally an immense mass of incandescent vapor gradually cooled and hardened after being thrown off from the grand central body—afterward elaborated by La Place into the present nebular hypothesis), that "the globe was once in a state of igneous fusion, and that as its heated mass began to cool an exterior crust was formed, first very thin, and afterward gradually increasing until it attained its present thickness, which has been variously estimated at from ten to two hundred miles. During the process of gradual refrigeration, some portions of the crust cooled more rapidly than others, and the pressure on the interior igneous mass being unequal, the heated matter or lava burst through the thinner parts, and caused high peaked mountains; the same cause also producing all volcanic action." The arguments in favor of this doctrine are almost innumerable; these are among the most prominent:

First, The form of the earth is just that which an igneous liquid mass would assume if thrown into an orbit with an axial revolution similar to that of our earth. Not many years ago Professor Faraday, assisted by Wheatstone, devised a most ingenious apparatus by which, in the laboratory of the Royal Society, he actually was enabled, by injecting a flame into a vacuum, to exhibit visibly all the phenomena of the formation of the solar universe, as contended for by La Place and by Humboldt in his *Cosmos*.

Secondly, It is perfectly well ascertained that heat increases with depth, in all subterranean excavations. This is

THE INVARIABLE RULE

In mining shafts, and preventive measures must always be devised and used, by means, generally, of air apparatus, to temper the heat as the depth is augmented; else deep mining would have to be abandoned. The rate of increase has been variously estimated by different scientists in widely distant portions of the globe. A few of them may be mentioned at this place, since it was upon a total miscalculation on this head that led to the present most deplorable results.

The editor of the *Journal of Science*, in April, 1832, calculated from the results obtained in six of the deepest coal mines in Durham and Northumberland, the mean rate at 1° of Fahrenheit for a descent of 44 English feet.

In this instance it is noticeable that the bulb of the thermometer was introduced into cavities purposely cut into solid rock at depths varying from 200 to 900 feet. The Dolcoath mine in Cornwall, as examined by Mr. Fox, at the depth of 1,350 feet, gave an average result of 1° for every 75 feet.

Kupffer compared results obtained from the silver mines in Mexico, Peru and Freiberg, from the salt wells of Saxony and from the copper mines in the Caucasus, together with an examination of the tin mines of Cornwall and the coal mines in the north of England, and found the average to be at least 1° of Fahrenheit for every 37 English feet. Cordier, on the contrary, considers this amount somewhat overstated and reduces

THE GENERAL AVERAGE

To 1° centigrade for every 25 meters, or about 1° of Fahrenheit for every 45 feet English measure.

Thirdly, That the lavas taken from all parts of the world, when subject to chemical analysis, indicate that they all proceed from one common source; and

Fourthly, On no other hypothesis can we account for the change of climate indicated by fossils.

The rate of increase of heat in the Duzzele shaft was no less than 1° Fahrenheit for every 30 feet English measure.

At the time of recommencing sinking in the shaft on the 10th of April, 1849, the perpendicular depth, was 2,370 feet, the thermometer making 43° Fahrenheit at the surface; this would give the enormous heat of 127° Fahrenheit at the bottom of the mine. Of course, without ventilation no human being could long survive in such atmosphere, and the first operations of the Commission were directed to remedy this inconvenience.

The report then proceeds to give the details of a very successful contrivance

for forcing air into the shaft at the greatest depths, only a portion of which we deem it important to quote, as follows:

The width of the Moer-Vater, or Lieve, at this point, was 1,980 yards, and spanned by an old bridge, the stone piers of which were very near together, having been

BUILT BY THE EMPEROR HADRIAN

In the early part of the second century. The rise in the tide of the North sea, close at hand, was from 15 to 18 feet, thus producing a current almost as rapid as that of the Mersey at Liverpool. The Commissioners determined to utilize this force, in reference to the erection of expensive steam works at the mouth of this mine. A plan was submitted by Cyrus W. Field and at once adopted. Turbine wheels were built, covering the space betwixt each arch, movable, and adapted to the rise and fall of the tide. Gates were also constructed between each arch, and a head of water, rising from 10 to 15 feet fall, provided for each turn of the tide—both in the ebb and the flow, so that there should be a continuous motion to the machinery. Near the shaft two large boiler-iron reservoirs were constructed, capable of holding from 150,000 to 200,000 cubic feet of compressed air. The average rate of condensation being about 200 atmospheres. These reservoirs were properly connected with the pumping apparatus of the bridge by large cast-iron mains, so that the supply was continuous, and at an almost nominal cost. It was by the same power of compressed air that the tunneling through Mount St. Gothard was effected for the Lyons and Turin Railway, just completed.

The first operations were to enlarge the shaft so as to form an opening 40 by 100 feet, English measure. This consumed the greater part of the year 1849, so that the real work of sinking was not fairly under way until early in 1850. But from that period down to the memorable 5th of November, 1872, the excavation steadily progressed. I neglected to state at the outset that M. Jenn Dussloy,

THE STATE ENGINEER OF BELGIUM,

was appointed General Superintendent, and continued to fill that important office until he lost his life on the morning of the 6th of November, the melancholy details of which are hereinafter fully narrated.

As the deepening progressed, the heat at the bottom continued to increase, but it was soon observed, in a different ratio, from the calculations of the experts. After attaining the depth of 15,650 feet—about the height of Mount Blanc—which was reached early in 1864, it was noticed for the first time that the laws of temperature and gravitation were synchronous; that is, that the heat augmented in a ratio proportional to the square of the distance from the surface downward. Hence the increase at great depths bore no relation to all the apparently gradual augmentation near the surface.

As early as June, 1868, it became apparent that the sinking, if carried on at all, would have to be protected by some athermanous or adathermic covering. Professor Tyndall was applied to, and, at the request of Lord Palmerston, made a vast number of experiments on non-conducting bodies. As the result of his labors, he prepared a compound solution about the density of white lead, composed of selenite alum and sulphate of copper, which was laid on three or four thicknesses, first upon the bodies of the naked miners—for in all deep mines the operatives work in *per se naturalibus*—and then upon

AN OVAL SHAPED CAGE

Made of paper mache, with a false bottom, inclosed within which the miners were enabled to endure the intense heat for a shift of two hours each day. The drilling was all done by means of the diamond-pointed instrument, and the blasting by nitroglycerine from the outset, so that the principal labor consisted in shoveling up the debris and keeping the drill point *in situ*.

Before proceeding further it may not be improper to enumerate a few of the more important scientific facts, which, up to the 1st of November of the past year, had been satisfactorily established. First in importance is the one alluded to in the above—the rate of increase of temperature as we descend into the bowels of the earth. This law, shown above to correspond exactly with the law of attraction of gravitation—had been entirely overlooked by all the scientists living or dead. No one had for a moment suspected that heat followed the universal law of physics as a material body ought to do, simply because from the time of De Saussure heat had been regarded only as a *fact* or *res effecta* and not as a ponderable quality.

But not only was heat found to be subject to the law of inverse ratio of the square of the distance from the surface, but the atmosphere itself followed the same invariable rule. Thus, whilst we know that water boils at the level of the sea at 212° Fahrenheit, it readily vaporizes at 185° on the Peak of Teneriffe, only 15,000 feet above that level. This, we know, is owing to the weight of

THE SUPERINCUMBENT ATMOSPHERE.

There being a heavier burden at the surface than at any height above it. The rate of decrease in weight above the surface is perfectly regular, being one degree for every 500 feet of ascent. But the amazing fact was shown that the weight of the atmosphere increased in a ratio proportioned to the square of the distance from the surface downward.

The magnetic needle also evinced some curious disturbance, the dip being invariably upward. Its action also was exceedingly feeble, and the day before the operations ceased it lost all polarity whatever, and the finest magnet would not meander from the point of the compass it happened to be left at for the time being. As Sir Edward Sabine finely said, "The hands of the magnetic clock stopped." But the activity of the needle gradually increased as the surface was approached.

All electrical action also ceased, which fully confirms the theory of Professor Faraday, that "electricity is a force generated by the rapid axial revolution of the earth, and that magnetic attraction in all cases points or operates at right angles to its current." Hence electricity, from the nature of its cause, must be superficial.

Every appearance of water disappeared at the depth of only 9,000 feet. From this depth downward the rock was of a basaltic character, having not the slightest appearance of a granitic formation, confirming, in a most remarkable manner, the discovery made only last year, that all granites are of igneous, instead of tysonic, deposition. As a corollary from the law of atmospheric pressure, it was found utterly

IMPOSSIBLE TO VAPORIZE WATER

At a greater depth than 24,000 feet, which point was reached in 1869. No amount of heat affected it in the least perceptible manner, and on weighing the liquid at the greatest depth attained, by means of a nicely adjusted scale, it was found to be of a density expressed thus: 198,0730, being two degrees or integers of atomic weight heavier than gold, at the surface.

[The report then proceeds to discuss the question of the true figure of the earth, whether an oblate spheroid, as generally supposed, or only truncated at the poles; the length of a degree of longitude at the latitude of Duzzele, 51° 20' N., and one or two other problems—not bearing on the points of the report—we do not wish to lay before the readers of the *Chronicle*. The concluding portion of the report we reproduce in full.]

For the past twelve months it was found impossible to endure the heat, even sheltered as the miners were by the adathermic cover and cage, for more than fifteen minutes at a time, so that the expense of sinking had increased geometrically for the past two years. However, important results had been obtained, and a perpendicular depth reached many thousands of feet below the deepest sea soundings of Lieutenant Brooks. In fact

THE ENORMOUS EXCAVATION

On the 1st of November, 1872, measured, perpendicularly, no less than 37,810 feet and 6 inches from the floor of the shaft building! The highest peak of the Himalayas is only a little over 28,000 feet, so that it can at once be seen that no time had been thrown away by the Commissioners since the inception of the undertaking in April, 1849.

The first symptoms of alarm were felt on the evening of November 1st. The men complained of a vast increase of heat, and the cages had to be dropped every five minutes for the greater part of the night; and of those who attempted to work, at least one-half were extracted in a condition of fainting but one degree from syncope. Towards morning, hoarse, profound and frequent subterranean explosions were heard, which had increased at noon to one dull, threatening and continuous roar. But the miners went down bravely to their tasks, and resolved to work so long as human endurance could bear it. But this was not to be much longer, for a late hour at night on the 4th, after hearing a terrible explosion, which shook the whole neighborhood, a hot stroke issued from the bottom which drove them all out, in a state of asphyxia. The heat at the surface became absolutely unendurable, and on sending down a cage with only a dog in it, the materials of which it was composed took fire and the animal

perished in the flames. At 3 o'clock A. M., the iron fastenings to another cage were found fused and the wire ropes melted for more than a thousand feet at the lower end.

THE DETONATIONS

Became more frequent, the trembling of the earth at the surface more violent, and the heat more oppressive around the mouth of the orifice. A few minutes before 4 o'clock, a subterranean crash was heard, louder than Alpine thunder, and immediately afterwards a furious cloud of ashes, smoke and gaseous exhalation shot high up into the still darkened atmosphere of night. At this time, at least one thousand of the terrified and half-naked inhabitants of the neighboring village of Duzzele had collected on the spot, and with wringing hands and fearful outcries bewailed their fate, and threatened instant death to the officers of the Commission, and even to the now terrified miners. Finally, just before dawn on the 5th of November, or to be more precise, at exactly twenty minutes past 6 A. M., *molten lava made its appearance at the surface!*

The fright now became general, and as the burning buildings shed their ominous glare around, and the languid stream of liquid fire slowly bubbled up and rolled toward the canal, the scene assumed an aspect of awful sublimity and grandeur. The plains around were lit up for many leagues, and the foggy skies intensified and reduplicated the effects of the illumination. Toward sunrise the flow of lava was suspended for nearly an hour, but shortly after 10 o'clock it suddenly increased its volume, and, as it cooled, formed

A SORT OF SAUCER-SHAPED FUNNEL.

Over the edges of which it boiled up, broke and ran off in every direction. It was at this period that the accomplished Dussloy, so long the Superintendent, lost his life. As the lava slowly meandered along he attempted to cross the stream by stepping from one mass of surface-cinders to another. Making a false step, the floating rock upon which he sprang suddenly turned over, and before relief could be afforded his body was consumed to a crisp. I regret to add that his fate kindled no sympathy amongst the assembled multitude; but they rudely seized his mutilated remains, and amid jeers, execrations and shouts of triumph attached a large stone to the half-consumed corpse and precipitated it into the canal. Thus are the heroes of science frequently sacrificed to the fury of a plebeian mob.

It would afford me pleasure to inform the Department that the unforeseen evils of our scientific convention terminated here. But I regret to add that such is very far from being the case. Indeed, from the appearance of affairs this morning at the volcanic crater—for such it has now become—the possible evils are almost incalculable. The Belgian Government was duly notified by telegraph of

THE DEATH OF THE SUPERINTENDENT

And the nutritious disposition of the common people about Bruges, and early on the morning of the 6th of November a squad of flying horse was dispatched to the spot to maintain order. But this interference only made matters worse. The discontent, augmented by the wildest panic, became universal, and the mob reigned supreme. Nor could the poor wretches be greatly consoled; for toward evening the lava current reached the confines of the old village of Duzzele, and about midnight set the town on fire. The lurid glare of the conflagration awakened the old Burgers of Bruges from their slumbers and spread consternation in the city, though distant several miles from the spot. A meeting was called at the Guild Hall at dawn, and the wildest excitement prevailed. But after hearing explanation from the members of the Commission the populace quietly but doggedly dispersed.

The Government from this time forward did all that power and prudence combined could effect to quell the reign of terror around Bruges. In this country the telegraph, being a Government monopoly, has been rigorously watched and a cordon of military posts established around the threatened district, so that it has been almost impossible to convey intelligence of this disaster beyond the limits of the danger. In the meantime a congress of the most experienced scientists was invited to the scene for the purpose of suggesting some remedy against the prospective spread of the devastation. The first meeting took place at the old Guild Hall, in Bruges, and was strictly private, none being admitted except THE DIPLOMATIC REPRESENTATIVES OF foreign Governments, and the members elect of the college. As in [Concluded on 5th page.]