NISSEN AND HIS "FOOL-KILLER NO. 3."

BY ORRIN E. DUNLAP.

It may take time and the efforts of others to demonstrate whether or no Peter Nissen has left anything of scientific value in the ideas he entertained of traveling over land or water in a balloon-shaped apparatus such as that in which he lost his life in an attempt to cross Lake Michigan on Tuesday, November 29 last. Despite his failure to survive the journey, it is evident that an apparatus such as he designed will roll with the wind over land, water, or ice, but it is too early in the history of the device to determine in what field it might prove serviceable or useful. Man has already devised and constructed so many things in which one may travel, that this infant of Nissen's has not yet found its place.

Considering that this adventure of Nissen's was the first of the kind man has ventured to make, it is to be regretted that he lost his life in the feat. It is reasonable to believe that he made the trip across Lake Michigan successfully, and that had aid been rendered him promptly on the Michigan shore, he would have lived to relate his experience. Even had the feat been performed at a season of the year when the weather conditions were more favorable for exposure, or more boats traveling up and down the lake, Nissen would in all likelihood be alive to-day. Recalling the stories told of sea serpents, it must be left to the imagination to conceive the story that a lake captain might have told had he been a witness of Nissen's strange craft rolling across the bow of his boat.

Peter Nissen believed his balloon-like apparatus had a value in connection with North Pole explorations. His first experiment with a rolling balloon pleased him. This first balloon was five feet long and three feet high. It had a shaft through its center, and on this he placed a car spring. He used a car spring because it was handy and convenient, and he felt it would slide from end to end, much the same as a man might move about. His experiments delighted him, and he decided to build the larger balloon, in the operation of which he lost his life.

This balloon was made of heavy canvas, and when inflated was 38 feet long and 22 feet in diameter. It had a porthole at each end, and through the center was a shaft about 12 feet long and 3 inches in diameter. This shaft was suspended from cords fastened around the inside, on exactly the same principle as the spokes in a wheel. On the shaft he arranged a sliding seat, so that he could move toward the ends, hoping in this way to steer the big ball by throwing one end up in the wind to cause it to swerve as he desired, as the high end would offer more surface to the wind. Suspended from the shaft and below the seat was a cradle or a boat, where he contemplated resting when fatigued from riding on the seat. A two-inch hose was run through one end of the balloon to furnish an air supply, a pump of his own invention being on the inside. "Fool-Killer No. 3" is the name he selected, he having previously built two boats for navigating the whirlpool rapids of Niagara, the first having been named "Fool-Killer No. 1," which was rebuilt and renamed "Fool-Killer No. 2." This latter boat was deserted and lost in the Niagara whirlpool on the evening of Thursday, October 17, 1901, after Nissen and a companion had floated helplessly about those rough waters for seven hours.

It was 3:10 P. M. November 29 when Nissen called from the inside of his balloon to set her free. Thirty-five minutes later the balloon had passed from sight of those at the foot of Ohio Street, Chicago, from which point the start was made. Late in the morning of the Thursday following Mrs. Sophie Koehler, the wife of a farmer living near Stevensville, Mich., found Nissen's body on the lake shore, and 200 feet away was "Fool-Killer No. 3," torn and wrecked. The coroner's jury decided that Nissen died from exposure, the supposition being that he had made an effort to reach shore, but was too much exhausted. He left no message, all reports to the contrary notwithstanding. As to his experience on the trip and when he died, there is nothing certain; but as the air hose was broken, it aroused suspicion that his supply of fresh air was cut off at some point on the journey across Lake Michigan to eternity.

The "Fool-Killer" Starting on Its Fateful Journey Across Lake Michigan.

Rolling the "Fool-Killer" Into the Lake.

NISSEN AND HIS "FOOL-KILLER."

Radium and Other Rare Elements in Mineral Water.

BY OTTO MEYER, PH.D.

In an analysis of a water from an artesian well, bored several hundred feet into the granite of Richmond, Va., called "granite lithia water," there were reported by me some ingredients which, it seems, have not been previously detected in mineral waters. They were cerium, lanthanum, didymium, beryllium (glucinum), bismuth, and also radium. While radio-active gases are known to exist in many waters, the supposition heretofore has been that radium, as such, was not in these waters. It is therefore considered necessary to give an account of the methods used in this analysis.

It was found that the barium of the granite lithia water, isolated in the usual way as $BaSO_4$, was slightly but unmistakably radio-active. This in itself can hardly be explained otherwise than by the existence of radium in it. It was deemed advisable, however, to look for all the additional proof that might be obtained in this case. Therefore 52 milligrammes of barium sulphate were obtained out of 550 liters of water, evaporated in 50-liter lots in china basins. This sulphate was transformed into carbonate, which again, by treatment with HBr, was converted into barium bromide. This was subjected to a series of fractional crystallizations from solutions in water, acidified by hydrobromic acid. Finally, there were 5 milligrammes of a quicker crystallizing and 31 milligrammes of a slower crystallizing barium bromide on hand. By an accident 4 milligrammes of the former substance were lost. The remaining 1 milligramme, wrapped in paper, was placed on a photographic plate, side by side with 1 milligramme of the second substance. After development it was found that the spot caused by the first substance was considerably stronger than the one caused by the second substance. The barium bromide, therefore, had become richer in radio-active substance by the fractional crystallization. We have then here the principal, if not the only, chemical characteristic of radium.

In examining for radio-activity, the photographic method was used. The substances, either in glass tubes or wrapped in paper, were placed on a plate, which had been wrapped in heavy black paper and was kept carefully in the dark. Some experience in developing is necessary in these experiments, where only small and often faint spots are obtained.

It is of the greatest importance to keep in view that freshly-ignited radium loses its power of emitting β and γ rays, which alone act on the plate. Within a month, however, the radium emanation is restored to nearly its original strength, and four weeks after a barium salt has been made, a test may be made.

The cerium group and glucinum were obtained in the precipitate by ammonia, which in a water analysis furnishes the iron and alumina. This precipitate was twice redissolved and reprecipitated. All the filtrates and wash waters together in a very large beaker were left standing for one or several weeks, when the precipitate formed again and settled during this time, was combined with the previous precipitate. The whole was dissolved in HCl, nearly neutralized, an excess of ammonium carbonate (solid) added, after standing a day or more, filtered, and the filtrate boiled, when the cerium group (or most of it) and glucina are reprecipitated. The filtered precipitate was dissolved in HCl, and the cerium group precipitated in slightly acid solution by ammonium oxalate. After one or several days' standing the earths were filtered and ignited. What remained insoluble in HCl, and HCl and alcohol, was considered as ceria. In another lot the separation with chromic acid was resorted to, and lanthanum and didymium separated in form of fused nitrates by water. No attempt was made here, where we have to deal with faint traces only, to go beyond didymium and establish neodymium and praseodymium.

The glucina was separated from iron and alumina, which eventually passed through previous treatments. by the method described in Crookes' "Select Methods," p. 125, as basic acetates, ammonium acetate being used instead of sodium acetate. The glucina obtained in this way was further examined by boiling the freshly-precipitated hydrate with ammonium chloride, which dissolved it, so that it could be reprecipitated.

The quantitative determination was attempted, in all cases, but "traces" were reported in each instance, as the quantities are extremely small. It is of no use to test less than 100-liter lots. The substances were obtained in three successive lots.

Bismuth was obtained only in two successive lots of 100 liters and 50 liters, finally as chromate, which is better adapted for qualitative than for quantitative examination. As the quantities, however, agreed exactly, it was reported quantitatively, instead of "trace."

In the course of the analysis of the water substances were met which possibly might be traces of other rare elements, and among these might be thoria, zirconia, and platinum. No time, however, could be given to a more thorough investigation, whether they really existed or not. Platinum, if it was such, was isolated from the sulphureted hydrogen precipitate of a 100-liter lot, after the other metals had been removed, as minute black flakes, which, according to previous treatment, might be platinum or iridium. Cupeled with test lead they gave a minute non-yellow button, under supposition of existing platinum, of lead-platinum, too small for any examination. As platinum occurs disseminated in certain rocks in North Carolina, it may be well to mention the matter for the consideration of future analytical work.

The greatest accumulation of coin in the world at present is that held by the Bank of France. At the beginning of August this amounted, in round figures, to 2,702,292,000 francs in gold, and 1,125,920,000 francs in silver; a total of 3,828,212,000 francs, or $765,642,400 in United States currency.