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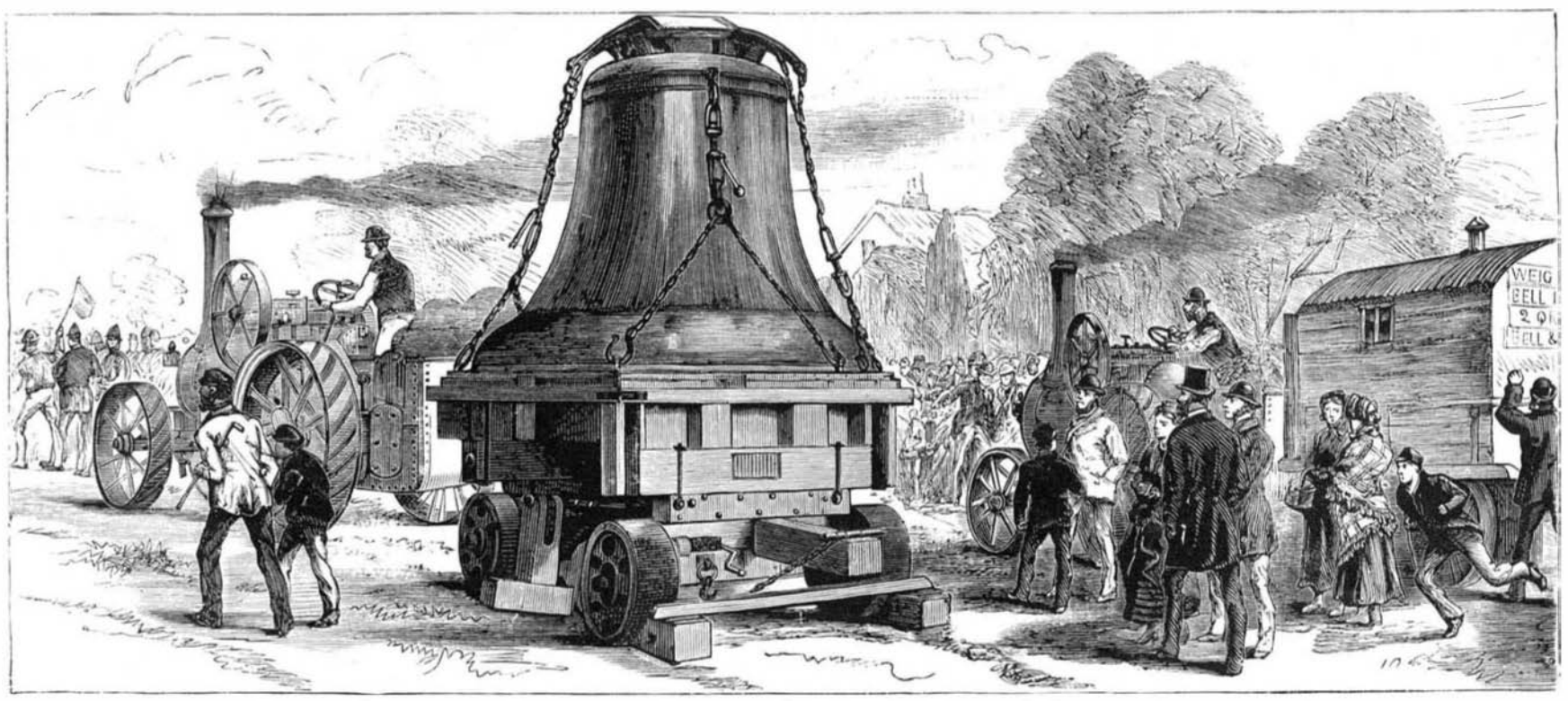
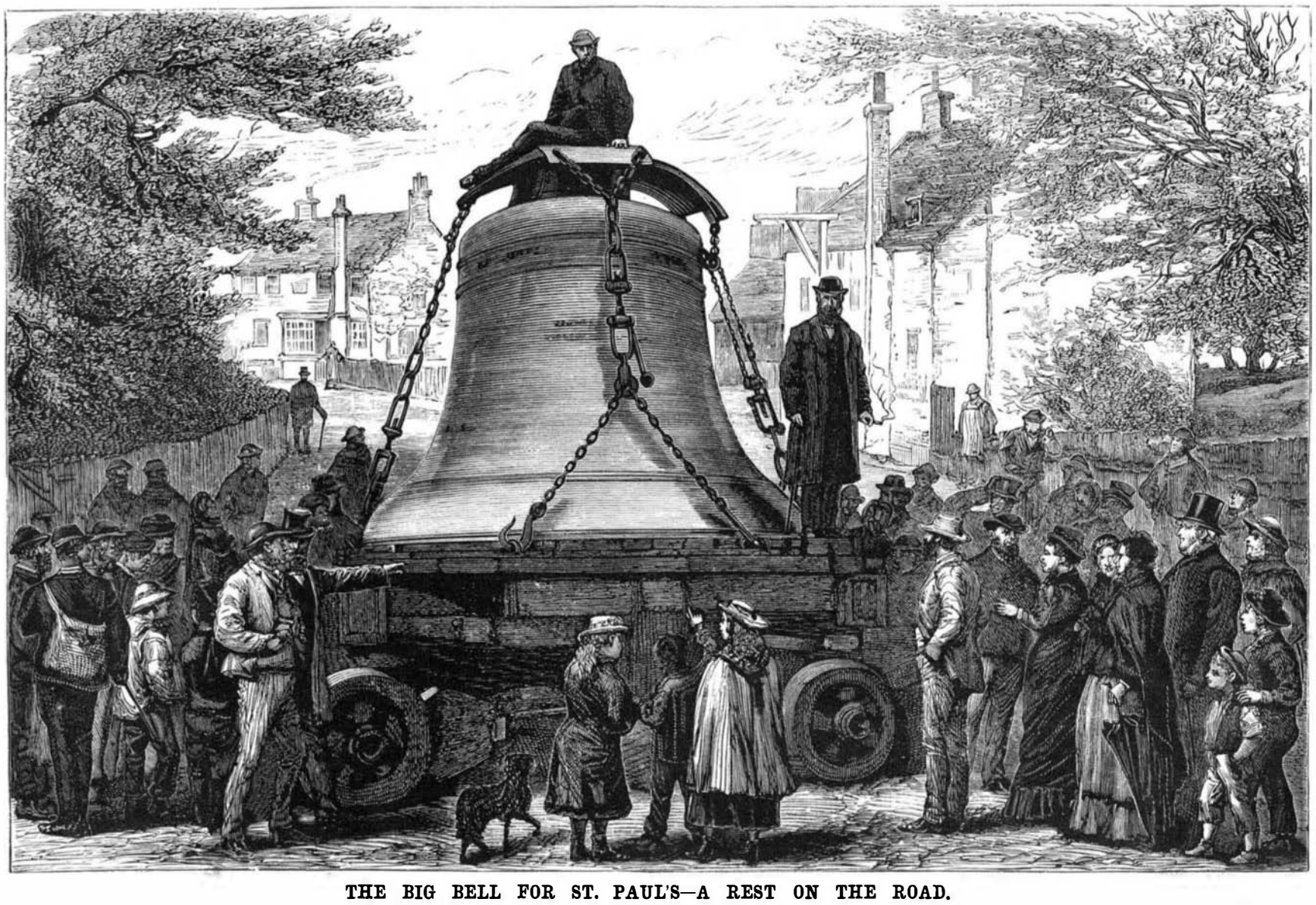
THE GREAT BELL FOR ST. PAUL'S.

The large bell manufactured by Messrs. Taylor, of Loughborough, Leicestershire, for St. Paul's Cathedral, arrived in London on Monday May 22, having been eleven days on the road, drawn by a traction-engine a hundred and fifteen miles. The contractors for the safe conveyance of this ponderous bell were Messrs. Coles & Matthews, of Coventry, who have performed their task with entire success. The bell weighs nearly seventeen tons, and stands above nine feet high, with a circumference of thirty feet at the rim. It was placed on a massive trolly, with low iron wheels of great width, the weight of the trolly and bell together being not less than twenty-two tons. A traction-engine took the heavily-laden carriage in tow; another engine drew a covered van, or hut on wheels, stored with jacks and engineers' tools of all kinds, for raising or repairing the trolly, in case of need. Attached to the rear of this traveling tool-house, which served also to shelter the men at night, was a cultivator, made for steam plowing, laden with boiler-plates, which could be laid down to assist in getting the wheels of the trolly over soft ground. Last of all, came a cask-shaped tank, to supply the two engines in traversing country where water might be scarce. The strange procession excited great curiosity and wonder in the rural districts of Northamptonshire, Bedfordshire, and Hertfordshire. In some places the local volunteers' band turned out. The bell was piloted along the road by Mr. R. Coles, riding on a tricycle, and accompanied by Mr. Taylor, with several London newspaper correspondents and others.

[*Continued on page* 6.]



THE BIG BELL FOR ST. PAUL'S—TRACTION ENGINES DRAWING THE BELL TO LONDON.



THE BIG BELL FOR ST. PAUL'S—A REST ON THE ROAD.

THE GREAT BELL FOR ST. PAUL'S.

[*Continued from first page.*]

On Saturday afternoon, having arrived near Highgate, on the road from Finchley, the bell was met by thousands of Londoners, who came up the Archway Road to witness such an unusual spectacle. It was taken into the coalyard of the Great Northern Railway at the Woodman Station, and was left there till Monday morning, when it was brought at an early hour into London, reaching St. Paul's Churchyard at eight o'clock. The arrangements made by Mr. Penrose, architect and surveyor to the Dean and Chapter of St. Paul's, for removing the bell from its traveling-carriage and introducing it within the south tower of the west front of the Cathedral, were not the least remarkable part of the undertaking. Some difficulty had been presented by the fact that the doorway into the tower proved too narrow by about 2½ feet, and the solid stone walls had to be cut away on each side, near the ground, while the masonry above had to be shored up with great care and ingenuity. Between this door and the spot at which the bell-carriage was drawn up, an elaborate timber slope had been constructed of beams 12 in. or 14 in. square, surfaced with slabs of oak, rendered slippery by a smearing of tallow and black lead. On to this slope the bell was dragged by the force of ropes and crabs or windlasses, but resting upon a circular wooden disk, to which it was fastened. The bell was thus enabled to slide slowly down in front of the door, and was then dragged up another short incline into the center of the tower. The machinery for lifting the bell to a height of 125 feet in the tower was very simple, consisting of two "crabs" from Woolwich Dockyard, each worked by four men, two men at each handle, to haul the ropes, 2¼ in. thick, through a series of blocks and pulleys, two above and two below. The operation would be done very slowly, but was expected to be performed on Wednesday or Thursday. There is a clear passage for the bell up the center of the winding staircase in the tower. Its destined position is beside the clock, and below the present big bell of St. Paul's, which strikes the hours.—*Illustrated London News.*

A Practical Sulphite-pyro Developer for Gelatine Plates.

BY W. T. WILKINSON.

Prepare two stock solutions as follows:

SOLUTION NO. 1.

Sulphite of soda (pure recrystallized)	4 oz.
Water	40 oz.

Dissolve the sulphite of soda, then add enough of a solution of citric acid to make a slight acid reaction with litmus paper. Then add one ounce of pryogallic acid. Increase the bulk of solution by the addition of water till it equals 54 ounces. Each ounce of solution will then contain 8 grains of pyrogallic acid.

SOLUTION NO. 2.

Water	40 oz.
Ammonia, strength 880°	1 oz.
Bromide ammonia	180 grs.

To commence development mix one part of No. 2 with two parts of No. 1, and immerse the plate in the developer thus made.

If the image does not appear within a minute and a half, add a small quantity of No. 2, which will increase the rapidity of development, which should be continued until the outline of the picture appears on the back of the film.

Equal parts of No. 1 and No. 2 will give a four grain pyro solution a strength which is a very good average. Under exposure with this developer does not yield harsh dense negatives, and if during development the exposure is seen to be too short the negative is removed from the developer, washed, and immersed for three or four minutes in solution No. 2, after which about one-quarter of the usual quantity of No. 1 is added, and a far finer result will be obtained than by the old process.

Over-exposure does not produce extreme flatness; in developing an over-exposed plate a large proportion of No. 1 and a minimum of No. 2 should be used.

From two to three plates can be developed in one mixed developer by adding a few drops of No. 2 each time.—*British Journal of Photography.*

Some Facts about Quicksilver.

In an elaborate report on the quicksilver trade of the world, Consul-General Vogeler, of Frankfort-on-the-Main, says that of late years California has supplied more than half of the quicksilver consumed in the world. Only two countries of Europe produce quicksilver in sufficient quantities to deserve mention in a commercial report—Spain and Austria.

The Spanish mines are located near the town of Almaden, province of Mancha, and were formerly owned and operated by the Spanish Government. They are now, however, held and operated by the great firm of Rothschild Brothers, of London, England, as security for a loan made by them to the Spanish Government; indeed, they seem to be, to all intents and purposes, the property of that firm. These mines yield about four-fifths of the entire production of Europe, while the Austrian mines, located near Idria, and the minor mines mentioned, produce the other one-fifth. As a consequence London, to which place almost the entire product of the Almaden mines is shipped, is the controlling market of Europe, and Rothschild fixes the price of the metal, except in so far as California, which produces more quicksilver than Spain and Austria combined, may undertake to become a disturbing element in that direction.

Quicksilver is carried and shipped in wrought iron flasks of 25 pounds, containing 75 pounds of the metal. Prices throughout Europe are always given in English money, and the quotations invariably refer to the flasks described.

The consumption of quicksilver in the world was estimated in the year 1876 to amount to about 80,000 flasks per year; in 1877 it reached 100,000 flasks; and since then it has averaged 133,000 flasks a year.

The principal uses to which quicksilver is applied are: (1) Meteorological and other scientific instruments; (2) chemical preparations; (3) looking-glasses and mirrors.

Twenty Centers of Manufacturing Industry.

The Census Bureau has just published the statistics of the manufacturing industries of twenty of the leading cities of the United States. The following figures show the number of manufacturing establishments in these cities, the number of men employed, the amount of capital invested, and the value of the annual product in the shape of manufactured goods:

City.	Manufactories.	Number of Employes.	Capital.	Annual Product.
Baltimore	3,596	55,201	$35,760,108	$75,621,388
Boston	2,521	56,813	42,750,134	123,366,137
Brooklyn	5,089	45,226	56,621,399	169,757,590
Buffalo	1,137	16,838	24,188,562	40,003,205
Chicago	3,479	77,601	64,177,335	241,045,607
Cincinnati	3,231	52,184	43,278,732	94,869,105
Cleveland	1,033	21,499	18,134,789	47,352,208
Detroit	875	15,062	14,202,159	28,303,580
Jersey City	555	10,688	11,329,915	59,581,141
Louisville	1,066	16,569	19,583,013	32,381,733
Milwaukee	821	19,620	13,811,405	38,955,138
Newark	1,299	29,232	23,919,115	66,234,525
New Orleans	906	9,439	8,401,390	18,341,006
New York	11,162	217,977	164,917,856	448,209,248
Philadelphia	8,377	173,862	170,495,191	304,591,725
Pittsburg	1,071	36,465	50,976 902	74,241,889
Providence	1,186	21,336	23,573,932	39,596,653
San Francisco	2,860	26,062	29,417,218	71,613,385
St. Louis	2,886	39,724	45,385,785	104,383,587
Washington	961	7,116	5,381,226	11,641,185

It will be noticed that New York city leads, Philadelphia falling to the second place. Chicago is a good third, and is increasing her manufactures at a rate which promises to give her the second place before many years. Brooklyn takes the fourth place, and Boston the fifth.

New Galvanic Cell.

Mr. F. Higgins, of London, has recently exhibited a new arrangement of the well known bichromate of potash battery, which yields very powerful currents, and is exceedingly economical, inasmuch as it utilizes the waste liquor of other bichromate batteries, and the residual scraps of zinc left by the wasted zinc plates. The cell consists of an earthenware jar fitted with an overflow spout near the mouth, and on the bottom is placed the scrap zinc in a pool of mercury. A copper wire insulated with gutta percha except at the foot, where it enters the amalgam of zinc and mercury, passes down the middle of the jar. Two carbon plates arranged parallel to each other are suspended from the mouth of the cell by a frame, and connected together by an electrode. The battery of these cells is built up by placing each one a little below the one before it on a step, platform, or stair, so that the overflow liquor of one cell may run into the next, and thus a continual circulation of waste liquor may be going on from the high reservoir to the low one. This circulation prevents polarization of the plates and produces a powerful and steady current. The electromotive force of each cell is from 1·9 to 2 volts, and its internal resistance is a mere fraction of an ohm. Nine of these cells are now working nine Morse circuits in place of a battery of 250 Daniell cells. Mr. Higgins estimates that 7,000 to 8,000 foot pounds of current energy can be supplied by them at a cost of about 6d.

The Perfume of Metals.

Recent experiments of M. H. Pellat, communicated to the French Academy of Sciences, tend to show that when two metal surfaces are brought very close together (say within a few tenths of a millimeter) a slight change takes place in the properties of the surfaces. The change requires a few minutes for its completion, and gradually disappears again when the disturbing metal is withdrawn. The phenomenon is detected by measuring the differences of potential between the electric strata covering the surfaces of the two metals in contact. The strongest effect of the kind is produced by lead and iron placed near another metal. Copper, gold, and platinum give a distinct effect, but zinc does not appear to possess the power. It would seem from these experiments as if metals gave off at common temperatures a volatile substance which, when deposited on the surface of objects, modifies their chemical nature. This opinion of M. Pellat is supported in his view by what we know of the smell of metals, a subject investigated by the late Professor Rankine.

Luminous Photographs.

A film is made of perchloride of iron and tartaric acid on a surface of softened glass; when it has been exposed, sulphide of calcium, rubbed to a very fine powder through a sieve, is dusted over it. The image is formed in the same way as if it had been dusted with any other powder, and it can then be transferred to paper.

METALLURGICAL INVENTION.

Improvement in Amalgamators.

An improved amalgamator, in which the ore to be amalgamated is more thoroughly pulverized and mixed than is usual in dry amalgamating machines, is patented by Mr. Henry M. Jones, of Santa Fe, N. M. The amalgamator box is of rectangular form, and has at each of its ends inclined planes, for the purpose of keeping the quicksilver in the center of the box. A number of pointed spikes project through the box bottom two or three inches, and are firmly fixed to the bottom. Rollers are placed transversely in the box, and journaled in its sides, that support and carry an endless belt. They are so arranged that the portion of the belt that passes over the bottom portion of the box shall be parallel with it, and at the rear end of the box shall pass parallel to the inclined part. The belt is provided with teeth, set in diagonal rows, and so arranged that they move in the interstices between the teeth in the bottom of the box, and they are firmly secured to the belt by nuts and washers. The belt extends the full width of the box, and is moved by means of power applied to one of the rollers, and as it is revolved the ore (which is fed in at the top of the box) and the quicksilver are thoroughly mixed together by the action of the teeth on the belt and in the bottom of the box, and the lumps of ore are broken up to expose them to the action of the quicksilver.

MISCELLANEOUS INVENTION.

Mr. John Drew, of Old Mission, Mich., has patented a novel flower-tray, for keeping cut flowers fresh during transportation or exposition. The invention consists in a box open at the bottom and provided with an aperture in its top, and with a closed cup attached to the under side of its top, into which cup the stem of the flower is passed through the aperture in the top. The tray has devices for holding the stem of the flower in the cup attached to the under side of the top of the box. The box has a water-reservoir passed into the bottom of the box for the purpose of supplying the cup with water to keep the flowers alive and fresh.

Improved Process of Photo-Engraving.

The metal plate, whether of copper or of zinc, is, in the first place, coated with a very thin layer of bitumen of Judæa, and when this coat has become perfectly dry, a film of bichromatized albumen is flowed over the plate. It is then exposed to the light, and afterward washed with water in order to dissolve all the albumen which has not been rendered insoluble by the luminous action; it is next treated with spirit of turpentine, which dissolves all those parts of the layer of bitumen that have become exposed. The plate can then be attacked directly by water acidulated with from four to six per cent of nitric acid. The great advantage of this method consists in the high sensitiveness of the bichromatized albumen, at the same time preserving the solid reserve produced by the bitumen of Judæa on a metallic surface. The albumen flows completely over the bitumen layer, and there is nothing in the process different from its original form, except it be the use of the spirit of turpentine in order to clear the metal in those parts which have been previously stripped of the albumen.

Salt Lake Gulls as Insect Killers.

The Salt Lake (Utah) *Herald* says that sea gulls have been uncommonly numerous and active there this spring. Wherever there was a newly plowed field there you could see the gull, and as fast as a furrow was turned up the birds would fly behind the plowman and commence devouring the insects which were thus exposed to sight. They seemed perfectly fearless. And they have good reason to be fearless here, for the farmer looks upon them as his friend, and they seem to understand fully that he holds them in that light. They fly all about him, within three or four feet, and while perhaps unwilling to submit to being caught, they will allow any other familiarity that can be practiced, for they themselves take a great many good-natured liberties. They will not touch grain, or anything that the farmer desires should remain untouched; they only eat the worms and insects which are injurious to the soil and to crops. Only once before have the gulls been so numerous, and that was in 1848, when they saved the settlers from an invasion of mountain crickets.

The Regulation of Dreaming.

A French investigator, M. Delaunay, finds from experiments upon himself that the character of his dreaming may be controlled by stimulating various portions of the brain by means of heat. By covering his forehead with a layer of wadding he gets sane, intelligent dreams. He has also experimented on modes of lying, which favor the flow of blood to particular parts, increasing their nutrition and functional activity. He has observed that the dreams he has while lying on his back are sensorial, variegated, luxurious. Those experienced when on the right side are mobile, full of exaggeration, absurd, and refer to old matters; but those produced when on the left side are intelligent and reasonable, and relate to recent matters; in these dreams one often speaks.

These observations may be correct so far as Mr. Delaunay is concerned; but most people who venture to lie on their back, especially after eating, are apt to find their dreams anything but luxurious.