SCIENTIFIC MUSEUM.

Analyzing Oils with Sulphuric Acid.

At the last meeting of the French Academy of Sciences, the following communication was presented by M. Dumas, from M. Maumene, on the above subject. The fatty oils mingled with sulphuric acid disengage heat, this action may serve to distinguish them; it separates in a striking manner the drying oils from those that are not so. Fifty grammes of olive oil having been placed in an ordinary test glass, the temperature of which was known by plunging a thermometer in the liquor, there were carefully dropped into it 10 cubic centimetres of sulphuric acid at the temperature of 66° (Baume). While mixing the liquids the thermometer was shaken, and the rise of the mercury noted. Beginning with the temperature of 25° for the oil and acid, the thermometer rose to 67°—increase, 42°. The mixing does not take more than two minutes, only one minute is required to obtain the maximum temperature.

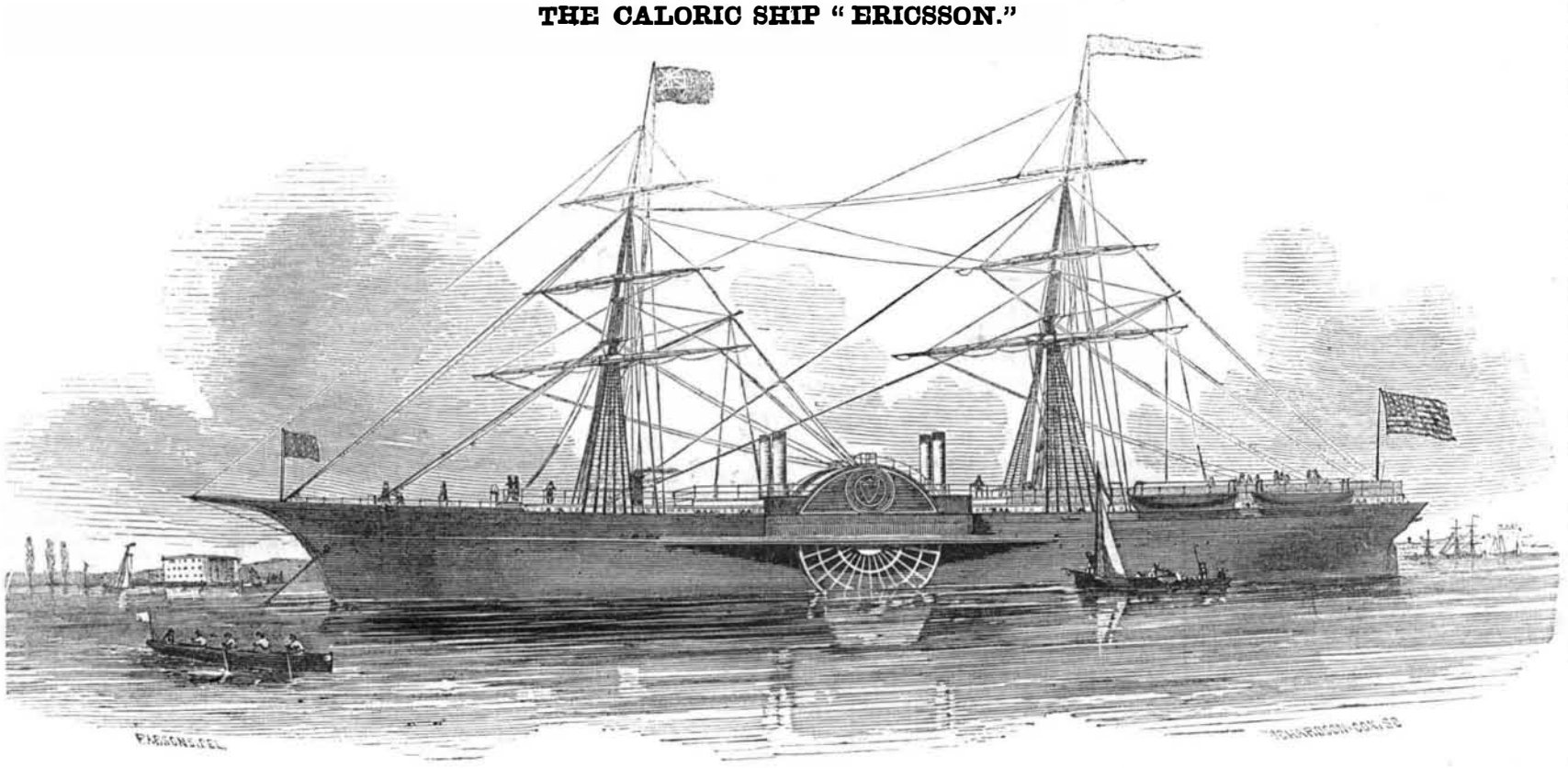
In another similar glass there were placed 50 grammes of oil of poppies, and it was likewise tested with sulphuric acid, the thermometer rose from 26° to 100°·5—increase, 74° ·5. In this instance there was noticed, firstly, a very remarkable developement of sulphurous acid, not caused by olive oil; and, secondly, a very great bubbling up of the liquid. On account of these two circumstances, the figure 74°·5 is too small. The difference between 42° and 74°·5 is sufficiently great to present a mode of analysis.

The experiment repeated several times under the same conditions, with the same olive oil, gave each time the same developement of heat at 42°. The experiment made with different sorts of olive oil, from various sources, proved that the action of the sulphuric acid is constant when the oil is pure, and when made with a similar degree of heat. The action of the acid is not less constant with the oil of poppies; experiments, moreover, prove that the developement of heat due to this oil is really at 88°·4, instead of 71° or 74 degrees, as the direct experiment indicates. This process of analyzing may be applied to the olive oils of commerce; these oils are often adulterated only with oil of poppies, and in such a case their analysis can be made with certainty, if their qualitative composition is sure. But how would it be in case of other oils? In answer to this inquiry, I have fixed the rise of temperature produced by most pure oils, it results from my researches that the oil of ben and oil of tar furnish almost the same disengagement of heat as olive oil. That the other oils produce a much greater disengagement of heat by means of which they can easily be distinguished from olive oil. Finally, that the drying oils give much more heat than the non-drying oils, and may be easily known. The oil of ben and of tar cannot be mixed with olive oil, consequently, whenever olive oil gives more than 42° of heat in its mixture with 10 cubic centimetres of sulphuric acid (at 25°) their oil is not pure. The preceding appears sufficient to show the use that may be made of sulphuric acid for analyzing oils. In mixtures composed only of two oils, the employment of this acid will very much help in determining its quality. When the qualitative analysis has been made the quantity may often be declared with precision.

LITERARY NOTICES.

THE MILK TRADE OF NEW YORK—By John Mullaly: Fowlers & Wells, pp. 118.; price 25 cts. An excellent little treatise on the Milk Trade of New York, an article that forms so important an item in the food of mankind. The author gives some useful statistics, and shows the injurious effects of using what is commonly called "swill milk," which, as is well known, is obtained from cows stabled in the city and fed on the refuse from brew-houses and distilleries. An exposure of this system of supply so deleterious to the health of our citizens was very much wanted, and we hope that this pamphlet will be read by every one.

THE CALORIC SHIP "ERICSSON."



The above is a view of the Caloric Ship "Ericsson," on her first trial trip, with a gale of fair wind, and the tide in her favor. She is now lying at "Green Point," there being something not complete about her machinery. For a full description and history of the Hot Air Engine, see first page. We are indebted to the N.Y. "Illustrated News," for the above cut.

Burning Fluid and Safety Lamps.

We have received a letter from a correspondent in Boston, containing an article from the "Haverhill Gazette," Mass., on the above subject. The author of it is evidently well acquainted with his subject, and it is one of much importance to the community.

The article in question says, "I have made a full investigation of the chemical character of the various liquids sold by dealers for the purposes of artificial illumination, and have subjected these compounds, and the lamps designed to be used with them, to very accurate experiments. Dangerous frauds have been continued for years by unprincipled men in the sale of those compounds without exposure," He asserts that a mixture of turpentine and alcohol, colored with turmeric, has been sold by dealers for years, under the name of "vegetable oil," with the unblushing assertion that it was *perfectly safe and unexplosive.* This mixture afforded by the distiller at 50 cents per gallon, at once in the hands of an unscrupulous dealer advances from 50 cents to 70 cents per gallon, by adding one cent's worth of turmeric to it, and changes from a volatile dangerous hydrocarbon or burning fluid to the *safe* vegetable oil. Such are some of the tricks of trade. Every case of this kind should be punished with severity. The author (we do not know him,) of the article in question, states that Newell's wire gauze lamp, which has been noticed in the Scientific American, is but a modification of the one patented by Isaiah Jennings, of this city, N. Y., in 1836, and the question is asked of us, if this is true, as Newell's has been sold for a *patent lamp.* We are not aware of any patent having been granted for it, and we cannot discover that one was granted to I. Jennings in 1836, but there was one in 1841, which combined a cotton percolator and wire between the fluid chamber and the flame. All volatile hydrocarbons are explosive, that is, any fluid employed for giving light, if it evaporates at a low heat, and this vapor is suffered to mix with the atmosphere it becomes an explosive gas. None of what are called the explosive fluids will explode until they become vaporized, it is the vapor, not the fluid, that is the cause of explosions. The author of the article in question asserts that in the lamps of Newell which he saw, there were orifices in the cap, made, as he was informed, at the suggestion of Dr. Jackson, for the purpose of letting off the vapor—a safety valve. If these lamps have small holes in their caps, it is a scientific blunder, for the grand object to prevent lamp explosions is to exclude the air. The pressure of heat from the vapor of an apartment, can never be so great as to explode the lamp. The safety of such lamps depends upon excluding the fluid and vapor from the atmosphere. A perfectly tight lamp never yet exploded. As we have stated more than once, we say it again, fluids should never, under any conditions, be used in a house where there are children or servants.

In this vicinity there is a dangerous burning fluid sold, by the name of "Rosin Oil," under the pretence that it is a safe unvolatile hydrocarbon. Five minutes before writing this, we examined some of this "Rosin Oil," which the purchaser supposed was something very different from a turpentine mixture: thus people are often deceived by names. There is an oil made from rosin by its destructive distillation, but not a burning fluid.

Drainage of a Lake by an Earthquake.

A singular phenomenon lately occurred in California, by which Lake Merced, a sheet of water, covering about thirty acres, and which is situated seven miles distant from San Francisco, threatens to become dry ground. A shock of an earthquake took place during the night, and in the morning it was discovered that a portion of the lake's boundary had been swept away, and a passage forced by the rushing waters about three hundred yards in width, and ten or twelve feet deep, opening on the sea shore to the width of a mile. Subsequently, a sort of mid-channel has been formed, commencing a short distance below the origin of the outlet, narrower and much deeper than the first, down which the water seems to have rushed with much velocity, until the lake has been emptied at least thirty feet below its previous surface. This mid-channel has gradually deepened in the centre, forming an outlet down which the waters are yet flowing into the ocean. And now that the outlet has been forced, from its abrupt sides may be seen flowing the gaseous fluids which succeed earthquakes among lofty mountains. It is supposed that the bed of the Lake may have been instantly uplifted, and as quickly have returned to its customary level; thus forcing an outlet through the heavy alluvial by which it was formerly confined.

Erratum.

In the description of the Safety Railway Truck, illustrated on the front page of last week's paper, the address of the patentee, A. L. Finch, should have been New Britain, Conn., this is the more essential because there are two "Britains" in that State.

MECHANICS

Manufacturers and Inventors.

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