WHALE FISHERY OFF THE COAST OF NORWAY.

There are, as well known, numerous fisheries of cod, herring, mackerel, etc., off the coast of Norway, but the most curious one is certainly that of the whale. This cetacean, which inhabits the polar regions, approaches the coast of Scandinavia about the month of June, in the train of numerous small fish called *lodde*, that come to the mouth of the rivers in order to deposit their eggs.

The whale that is fished off the coast of Finmark is the blue whale, an animal quite different from the species found in Greenland and called the right whale.

The fishing is authorized by Norwegian laws only from June to September. It is carried on quite near the coast, and a boat sometimes remains but two or three hours out of port. Thus, during the voyage of Oscar II. along the coast of Finmark, three whales were encountered between Vadso and Jacobselv. Another time a boat from Vadso captured one near the works established upon the small island opposite that city, that is to say, ten minutes' distance from the port.

Whale fishing in these regions is very ancient, as is proved by certain Norwegian legends, which relate that the giants who inhabited Finmark were of so great size and strength that they could take whales by the line. If they took two at once, they attached them by the tail and suspended them from their *hjelders*, as fishermen do with the cod that they are drying.

The great whale fishing industry was for a long time concentrated at Vadso, a small Finnic town of Varangerfjord. It is here that are located, upon the small island that we have mentioned, the establishments of the celebrated Mr. Foyn, the king of the whalemen. This person, who is still living, is a southern Norwegian, and was a sailor in his youth. Through his energy and intelligence he has ac~~quired a fortune that is now reckoned by millions.~~ At the epoch at which he began whale fishing it was not customary to bring these animals to the shore to strip them, but the fisherman who had taken one cut it up on the spot and lost many of the products. At this time only the whalebone and fat were utilized. Mr. Foyn conceived the idea of establishing himself upon shore, and of sending out small whaleboats to seek for these marine monsters, in order to bring them to his works, where nothing is lost, since, after the meat and fat have been removed for making oil, the detritus and bones are used for the manufacture of fertilizers. Mr. Foyn may be said to have established himself under excellent conditions, seeing that the whales come as far as to Varangerfjord, and that after a few hours' fishing it is certain that one or more will be brought it. It was he, moreover, who first utilized an invention that left far in the rear the antique harpoon thrown by hand from a fragile boat. The Foyn harpoon, which is a little over three feet long, is thrown by a small cannon placed in the bow of a steamship, 80 feet in length, with a crew of ten men.

This vessel, which costs between twenty and twenty-five thousand dollars, has a speed of 14 knots per hour. The cannon is pivoted, and carries a sort of stock that permits of pointing it in every direction. A cock, whose trigger is manipulated by a long cord, discharges the cannon at the moment desired. The cannon is aimed precisely like a rifle. The extremity of the harpoon is provided with a small steel-pointed bomb, which bursts after entering the whale's body. At this moment several rods, which up to this time had lain along the harpoon, spread out like the ribs of an umbrella, and prevent the rod from coming out of the animal's body. To the harpoon there is attached a long cable, which is coiled up in the hold, and which passes over several brakes actuated by steam.

The one who aims (who must be a very cool and skillful man) holds the butt of the gun with one hand and the cord that pulls the trigger with the other. When a whale has been sighted by the watcher at the masthead, the boat advances in the direction of the place where it has dived, so as to be ready to receive it at the spot where it will come to the surface in order to breathe. It is experience alone that teaches one to calculate the distance that the whale will travel between these two spots. In general, the whale is fired at from a distance of about 80 feet. It appears that the greatest difficulty is to strike the animal in such a way that the harpoon shall not pass through a certain part of the body, but shall be implanted therein and explode. This is why the cannon must not be heavily loaded.

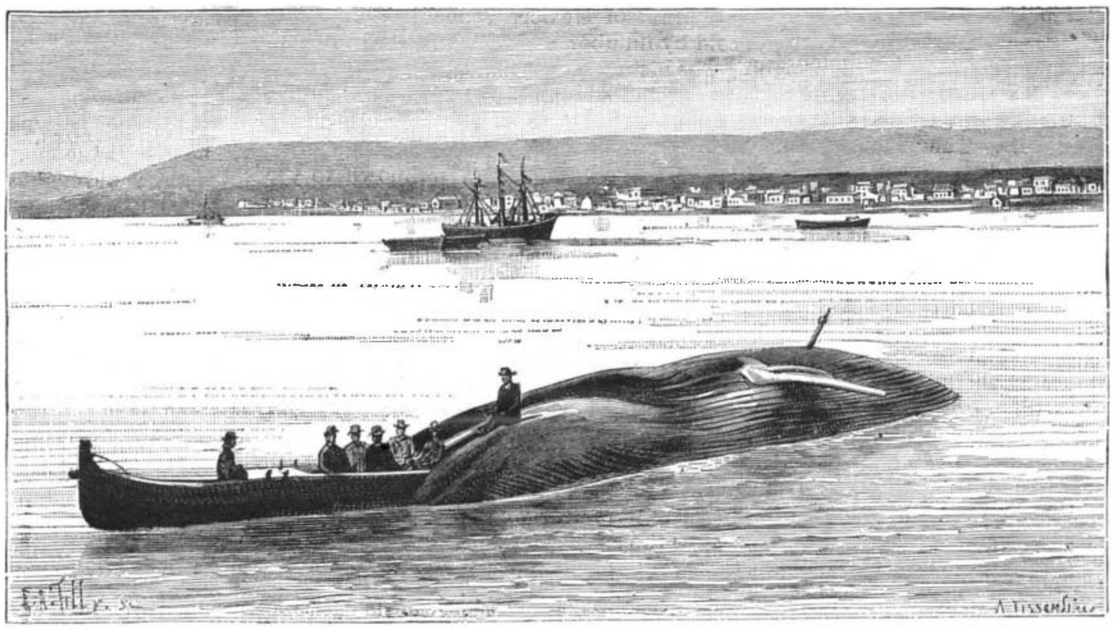

Fig. 1.—WHALE CAPTURED AT VADSO, AUGUST 15, 1884.

When the animal perceives that it is struck, it suddenly dives, and uncoils the immense cable on board ship and carries it along with terrific speed. In order to oppose this the engine is reversed, and from each side of the ship, perpendicular to its sides, are spread out wings analogous to those found on Dutch boats. The whale sometimes goes to the bottom, and it is then difficult to raise it when the sea is rough. At the end of a certain time it returns to the surface to breathe. When it is dead, a boat with two men puts off to pierce its lower jaw and tail and attach an iron chain thereto. After this the animal is towed alongside the ship so that its head and tail are visible.

Foyn's land establishment consists of several parts. In the first the whale is carried to an inclined plane dug out of the rocks. When it is high tide and the animal is floating, the latter is attached by chains to rings set into the rocks. When the tide runs out, it leaves the whale on the inclined plane. At this moment men, armed with long knives affixed to the extremities of great handles (Fig. 2), begin to cut out long strips of fat from the animal's sides. When two parallel incisions have been made, a hook is attached to the most distant extremity. This hook is affixed to a chain that winds around a windlass moved by several men, who, combining their efforts, detach the strip of fat from the animal's body. They are aided in this operation by another man, who, provided with a long knife, cuts all the tissues that offer a resistance. When this strip is removed, it is placed upon the inclined plane until it can be taken up and carried to a large kettle, in order to convert it into oil. After the fat is removed, all the greasy matter possible is extracted. Then the lungs and intestines are removed and thrown away.

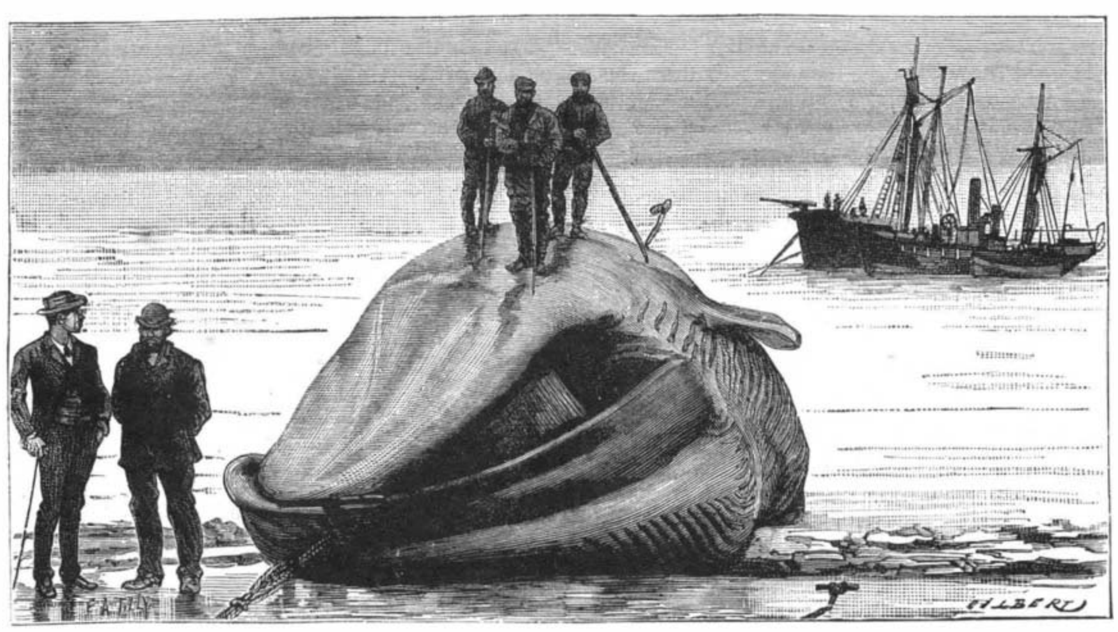

Fig. 2.—WHALE READY TO BE CUT UP.

It takes eight days to cut up one of these animals. In another place, chopping machines and mortars are installed under a shed that communicates with the ocean through an inclined plane. It is here that all the remains of these sea giants are reduced to a pulp in order to convert them into a fertilizer, which, later on, will find its way to the fields of Northern Germany.

On the day of our arrival at Vadso we went to visit the establishment, and Mr. Bull, Mr. Foyn's representative, did us the honors thereof. We were obliged to land at a slippery stairway, and had to perform miracles in the way of balancing in order to keep from falling. We first visited the inclined plane, but there was nothing curious in the aspect of this. Then, going along one of the rear buildings, we passed along a lot of kettles, in which were boiling debris of meat and fat, that gave out an odor calculated to make one sick at his stomach. From time to time great bubbles burst upon the surface, and gave out a still more nauseous and infectious odor, so that it became necessary to hold our noses.

A little further along, after passing over a small bridge covered with oily slush, we entered the shed that contains the mortars. Here it was still more frightful. In one corner there was a whale's head being cut up, and, as it was several days old, the emanations from it were something horrible. Men wearing great boots were working among these debris, which they carried to the mortars with immense hooks. They are so used to these surroundings that they do not smell anything. It was very difficult to maintain one's footing on the slippery ground here, which was covered with debris lying amid puddles of blood and grease mixed with mud. We had never seen anything so repulsive. We afterward took a tour in the fertilizer house, where the odor, which was as strong as under the shed, was much more disagreeable on account of its pungency. It was with pleasure that we breathed the ocean air, which, on our arrival, appeared to contain few pleasant odors.

Up to recent times the Vadso establishment had been the only one that existed in these regions, and so the profits from it were large; but, during the past few years, several companies have been formed in Norway and Russia, and especially at Vadso, so that, hunted beyond measure, the whale has rapidly diminished in numbers. Some assert that this diminution is due to the disappearance of the schools of small fishes that the animal was said to feed upon; but it has been really demonstrated that the whale does not eat them.—*R. Bonaparte, in La Nature.*

A City Moving.

From recent surveys it has been ascertained that the entire city of Virginia, Nevada, has moved over thirty inches to the east since the big fire of 1875. The Maynard block, in Golden Hill, is known to be gradually sliding down in the direction of Gold Canon, and has moved nearly two feet since its erection. This movement is so gradual that it does not affect in any manner the safety of the building, as the ground to a depth of nearly one hundred feet to the bed rock is known to be continually sliding. It is a well known fact among practical miners that the ground on which Virginia City is built is what is termed a slide, and that it is necessary to sink nearly one hundred feet before finding the natural bed rock. These slides are caused by the constant crumbling of the rocks on the mountain sides. The debris thus accumulated through incalculable ages is constantly gravitating downward, and in a few hundred thousands of years what is known as the site of Virginia City will be nothing but barren bed rock, worn as smooth by the action of the elements as the southern slope of Sugar-loaf Mountain; and were it possible for structures built by human hands to withstand the decay of time, the entire city itself would then have been forced out on the flat between the mouth of Six-mile Canon and the Carson River.—*Virginia Chronicle.*

Photographing by Artificial Light.

The light obtained by the burning of magnesium ribbon has been used extensively as an artificial light for photographic purposes, so that now, in consequence of the introduction of extra sensitive dry plates, it is possible for the amateur photographer to amuse himself during his leisure evenings by taking pictures as rapidly with this light as was formerly required by day light.

In place of magnesium ribbon, which is somewhat expensive, light produced by some cheaper pyrotechnic compound is said to answer a very good purpose. Referring to this subject, *The Photographic Times* remarks:

By far the best, as it is also the cheapest, source of light among the pyrotechnic compounds is that which has a time honored reputation as "signal fire," or very frequently as "Bengal light." This is composed of six parts (by weight) of saltpeter, two parts of sulphur, and one part of sulphide of antimony. In the preparation of this compound each must be powdered by itself, and the powder kept in dry canisters. They are then mixed together in the proportions given above. After a little experience has been acquired in the compounding of these substances, the weights and scales may be discarded in favor of measures representing the values of the respective weights.

The lantern in which the compound is burnt consists, in its most advantageous form, of a large parabolic reflector formed of tin, although we have known a common packing case to render excellent service. The front of the lantern ought to be from two to three feet across, and it must be covered with thin tissue paper. The back must have a small door through which is introduced the little cup that contains the requisite charge of the powder, there being a stand upon which to place this cup. The door at the back also serves for the introduction of a lighted match to ignite the powder when an exposure is about to be made.

It is an improvement when a small metallic chamber having violet glass in front is made the receptacle of the burning compound, as it prevents the interior of the large lantern from being incrusted with the smoke, and also causes the light emitted to be of a color that does not distress the eyes of the sitter. A capacious chimney must communicate with the burning chamber to insure the products of combustion being carried off.

The particular form of chimney we employ for both this purpose and the ignition of magnesium is one which we can strongly recommend. It is formed of calico, which is kept distended by a spiral spring made of fine wire. Its diameter is between three and four inches, and the length sufficient to reach any window or chimney within twelve or fifteen feet of the lantern. In the case of a window it is merely opened a little at the top and the end of the flexible chimney projected, and kept in position by means of a pin. The flexibility of this chimney permits of its being easily packed away when not in use.

The lantern must be placed upon a stand so as to be a little higher than the sitter. When a spoonful of powder is placed in the cup and ignited, the front of the lantern becomes practically a highly luminous artificial cloud throwing a powerful light upon the sitter, yet without any strong shadow being cast. This exemption is secured by the large diameter of the front of the lantern. The intervention of the violet glass and of the tissue paper causes the light which falls on the sitter to be soft and agreeable. White reflectors may be placed at the side of the sitter at the taste of the operator. Owing to the actinic power of the light a brief exposure suffices, usually from two to five seconds proving enough. As but little of the compound is required to give a light of such brief duration, this system of lighting is strictly economical.

Ancient Mexican and Central American Measures.

Professor Daniel G. Brinton, in a paper lately read before the American Philosophical Society, gives many interesting facts. Among other observations he says:

Whatever the lineal standard of the Aztecs may have been, we have ample evidence that it was widely recognized, very exact, and officially defined and protected. In the great market of Mexico, to which thousands flocked from the neighboring country (seventy thousand in a day, says Cortes, but we can cut this down one-half in allowance for the exaggeration of an enthusiast), there were regularly appointed government officers to examine the measures used by the merchants and compare them with the correct standard. Did they fall short, the measures were broken and the merchant severely punished as an enemy to the public weal.

The road measures of the Aztecs was by the stops of the carriers, as we have seen was also the case in Guatemala. In Nahuatl these were called *nececuilli*, resting places, or *netlatolli*, sitting places; and distances were reckoned numerically by these, as one, two, three, etc., resting places. Although this seems a vague and inaccurate method, usage had attached comparatively definite ideas of distance to these terms. Father Duran tells us that along the highways there were posts or stones erected with marks upon them showing how many of these stops there were to the next market towns—a sort of milestones, in fact. As the competition between the various markets was very active, each set up its own posts, giving its distance, and adding a curse on all who did not attend, or were led away by the superior attractions of its rivals!

So far as I have learned, the lineal measures above mentioned were those applied to estimate superficies. In some of the plans of fields, etc., handed down, the size is marked by the native numerals on one side of the plan, which are understood to indicate the square measure of the included tract. The word in Nahuatl meaning to survey or measure lands is *tlalpoa*, literally "to count land," from *tlalli* land, *poa* to count.

The Aztecs were entirely ignorant of balances, scales, or weights. Cortes says distinctly that when he visited the great market of Mexico, Tenochtitlan, he saw all articles sold by number and measure, and nothing by weight. The historian Herrera confirms this from other authorities, and adds that when grass or hay was sold, it was estimated by the length of a cord which could be passed around the bundle.

The plumb line must have been unknown to the Mexicans, also. They called it *temetztepilolli*, "the piece of lead which is hung from on high," from *temetztli*, lead, and *piloa*, to fasten something high up. Lead was not unknown to the Aztecs before the conquest. They collected it in the Provinces of Tlachco and Itzmiquilpan, but did not esteem it of much value, and their first knowledge of it as a plummet must have been when they saw it in the hands of the Spaniards. Hence their knowledge of the instrument itself could not have been earlier.

Prof. Brinton's conclusions are as follows:

1. In the Maya system of lineal measures, foot, hand, and body measures were nearly equally prominent, but the foot unit was the customary standard.

2. In the Cakchiquel system, hand and body measures were almost exclusively used, and of these, those of the hand prevailed.

3. In the Aztec system, body measurements were unimportant, hand and arm measures held a secondary position, while the foot measure was adopted as the official and obligatory standard both in commerce and architecture.

4. The Aztec terms for their lineal standard, being apparently of Maya origin, suggest that their standard was derived from that nation.

5. Neither of the three nations was acquainted with a system of estimation by weight, nor with the use of the plumb line, nor with an accurate measure of long distances.

Incidentally Prof. Brinton, after comparing the old Central American measures with those of the mound builders of the Ohio Valley, concludes that the "mound builders" probably used a ten-foot measure to lay out their works.

An Unsatisfied Want.

I want a planer with plenty of backbone in it; and to get this there must be no niggardly economy of iron. The platen must be heavy and stiff, and must not run far off the ways at the ends. The ways should have plenty of surface, so as not to squeeze out the oil, and cut under a heavy load. The rack and gears should be cut so as to run without back lash; for I do not want gear marks on my work after a finishing chip. I want the square holes for bolts and the round stop holes planed and reamed to gauge, so that fitted bolts and stops will fit all the holes. As to the stop holes, it is heathenish to use a hammer; the stops should be pushed home by the hand; we are not splitting logs when we are fastening work to the platen.

I want the crosshead with plenty of bearing surface on the uprights, so that a trifle of wear on the lower end will not unfit the crosshead for higher work. I want the gibs, both in the crosshead and in the saddle, made wedge shaped, so that I can adjust them with one screw on the end instead of using half a dozen screws on the side, which require much time to adjust evenly.

I want the shipping motion to work alike and exact, so that in planing plump up to a shoulder I shall not run against it and break the tool or smash the work. The feed motion should be positive, so that if I require a feed of just one tooth it shall be exactly one tooth, and a feed of twenty teeth shall be twenty teeth, not twenty and one-half with a slip back of half a tooth, or twenty teeth this time and twenty-one the next time.

I want the planer geared so that I can take a heavy chip without the planer winking. I want a solid foundation for the machine, on masonry piers, if necessary down to hardpan, so that the passing of a loaded truck over the floor will not spoil a finishing cut. I want the speed changeable by an extra countershaft, so that I may change from working rigid steel to soft composition; and with these qualities in a planer I can do a good job.

These are the complaints and opinions of a machinist that has run planers for thirty years, and they possibly contain suggestions that may be of value to machine tool builders.

"Read Less; Think More."

The late Charles O'Conor, perhaps the most profound lawyer New York city has produced, gave a piece of advice to a young man which is as valuable as any legal opinion for which the distinguished lawyer ever received a fee. A lad wrote to him, giving a long list of books which he had already gone through, and asking advice as to a course of reading. Mr. O'Conor replied that "he had not only not read, but had not known even by name one-half of the books his correspondent appeared to have read. He would not therefore, undertake to advise him what to read, but he could safely advise him to read less, and think more." This anecdote comes from a recent number of the *Century*.

The advice was not, however, original with Mr. O'Conor. In the Philadelphia *Ledger* some time since an older authority was quoted to the same purport. Probably the same sound wisdom could be traced back to the time of the invention of printing. "Read less (of trash) and think more" has a pithiness which makes the advice all the more easy to keep in mind. And following it would enable the "temperate" reader not only to think, but to remember more of what he reads. Remembering more would give a practical value to the ideas acquired and the facts obtained. Perhaps Mr. O'Conor's opinion on reading is to be qualified a little by his practice. It seems that his reading was very much confined to the purposes of his profession. No doubt this limit increased his wonderful efficiency in his legal pursuits. But it would be a great abridgment of mental freedom to restrict the reader to his specialty and forbid excursions outside of that. The mind is enlarged by a variety of topics, and there is scarcely any subject, however foreign to a thinking person's daily life, from which he may not derive some advantage. There is nothing in the way of learning which stands so much alone that it cannot be illustrated by other and indeed apparently dissimilar matters. Still the caution holds good—to most readers—"read less and think more."

Lacing Belts.

The market is full of devices for fastening the ends of belts, but there seems to be no diminution in the importation of Patna hides and the use of leather lacings. Lacings are absolutely necessary in remaking once used belts, as after the belt has been oiled the cement ceases to "take," and the riveting of scarfs is very unsatisfactory. But in many instances the butting of belts is preferably done with lacings. The belt awl—or awls, for there are several patterns—as generally in use, is not properly shaped. It depends on a point to start a hole, and enlarges the hole by the larger round or lozenge-shaped section. This tears and crowds the fibers of the leather, and tends to cockle the belt. The belt awl should be patterned after a mortising chisel, except perhaps that the edge need not be of the entire width of the blade, and the blade may be slightly curved for ease in handling. A sharp chisel edge will cut a clean hole, or rather a slit, which may be opened for the passage of the lacing, and not being a violent disturbance of the leather, the slit will close firmly around the lacing when it is in place. The temporary spreading of the hole crosswise may be made by the thicker cross section of the awl, corresponding to the flattened lozenge of the mortising chisel. In butting belts, however, the first row of holes should be made with the punch, and a triangular punch is better than the common round punch, one of the faces of the triangle to be in line with the cross cut of the belt.

Unless absolutely necessary to "take up" or mend a belt in working hours, it is best not to run it off the pulleys for this purpose. It is always mere guesswork to know how much to cut out of a slack belt when it is off its pulleys, and it is not uncommon to have the job to do over, sometimes more than once. Taking up belts should be deferred, if possible, to a nooning or the shutting down of the works. Then a pair of clamps should be used to bring the open ends of the belt together while the belt is on its pulleys. There are clamps for this purpose that do not require the use of wrenches; the jaws are always in line (parallel), dispensing with the use of the straight edge, and they are actuated by a crank. Except for very wide belts, these clamps can be handled by one person. By their use the exact tension of the belt can be secured, its perfect line preserved, and a clean joint made with the belt in the handiest possible position for working on it.

Wind Mills.

An 8½ foot wheel will raise 3,000 gallons of water daily a distance of 25 feet. Its first cost, including pump and a plain tower, is about $150. A 10 foot wheel will raise about 9,000 gallons of water a day a like distance, and cost about $180, including the appurtenances above mentioned. A 12 foot wheel will raise 16,000 gallons of water per day the above distance, and cost with the same appurtenances $210; so up from 14 to 16, 18 to 20 feet diameter of wheel until we reach a 25 foot wheel, which costs about $1,200 and will raise 100,000 gallons of water daily the specified distance.