

**THE SILK-PRODUCING SPIDER OF MADAGASCAR.**

Some very interesting experiments have just been made at the Professional School of Tananarive with a view to rendering practical to a certain degree, the utilization of the thread of the silk-producing spiders indigenous to the great island of Madagascar. Visitors to the Exposition will have an opportunity of seeing specimens of the splendid fabric manufactured from this material. Some dithyrambic articles have already appeared in the Parisian papers announcing to the public at large a new industry—that of “araeculture,” destined to take a place alongside of sericulture.

“The spider, the ugly spider is preparing marvelous riches for us. . . . Tananarive is going to dethrone Lyons. The banks of the Rhone are no longer to be the only ones to rear silk producers, for the Imerina already counts her own.” It is well to reduce things to more modest proportions, and I am going to present them in their true light.

The author of the article that I have just cited says himself that the “Halabé” (as the Malagashes call the silk-producing spider) is quite difficult to reproduce, since the female, which alone yields the thread, is so ferocious and ravenous that the male cannot approach her except with the greatest precaution, and not until after he has assured himself of her feelings; for, in most cases, she kills and eats him. So these insects multiply only in certain favored places, such as the extensive woods of mango trees of the royal gardens in the vicinity of Tananarive, where they do not devour one another, since they are there assured of an abundance of food.

Under such unfavorable conditions it is almost impossible to hope for an unlimited artificial rearing, as with the silk worm, and it seems to be inevitable that we shall have to confine ourselves to an exploitation of the spiders that live in these privileged localities, taking care not to decimate or destroy them. This simple exposé suffices to demonstrate that it is impossible to count upon the utilization of these arachnids as a genuine industry. Nevertheless, we may hope, from the experiments made, to derive a certain advantage, on a small scale, in having for our objective only the manufacture of exceedingly rare and valuable fabrics.

At the beginning of last winter I visited the Professional School of Tananarive founded by General Gallieni in the old palace of the queen and its adjoining buildings. This institution will prove one of the most fruitful of the General's works in Madagascar, if its directors are able to maintain it in the eminently practical way that has been traced out for them. The young Malagash pupils attend the lectures with the greatest assiduity, and they and the professors and monitors vie with each other in zeal.

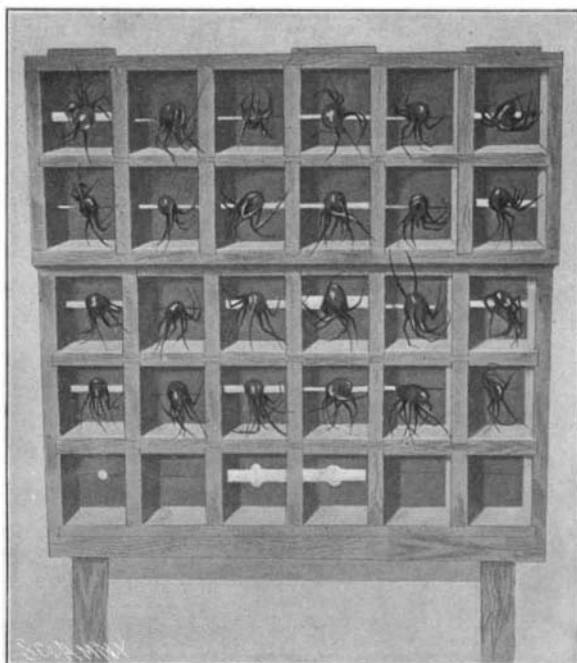
During the course of my visit, I had an opportunity of seeing the operation of reeling the silk from the spider performed under my eyes, and was enabled to photograph the different phases of this very curious process. In the first place, the spiders are brought from the country in light baskets by Malagash women on the very day upon which the silk is to be reeled. It is important, in fact, that they shall be left shut up together for but a short time, since they have an unfortunate habit of devouring one another, and the risk would be run of eventually finding nothing but the single survivor! The operator then proceeds as in reeling silk, that is to say, he unites several threads and twists them at the same time that they are reeled, so as to produce a thread of the desired size.

As for the spiders, they are placed in a frame in groups of one or two dozen. It is important not to mutilate or wound them during the operation, since they are capable of being submitted to four or five successive reelings in a month, representing about four thousand yards of thread. At the Professional School of Tananarive the idea has occurred to place the spiders in what are called “guillotines,” the crescents of which hold them between the abdomen and corselet. Their legs are turned back upon the corselet and their abdomen emerges from the side on which the unwinding and twisting of the thread is done. The Malagash girls, in performing this delicate operation, touch the end of the abdomen of the prisoners with the finger and then gently withdraw the latter, thus carrying along, in a single bundle, the twelve or twenty-four threads to a hook that unites them into a single one, whence they afterward start for the bobbin upon which they are to be wound.

In order to effect the reeling and twist-

ing of the thread at the same time, an ingenious system has been devised that gives excellent results.

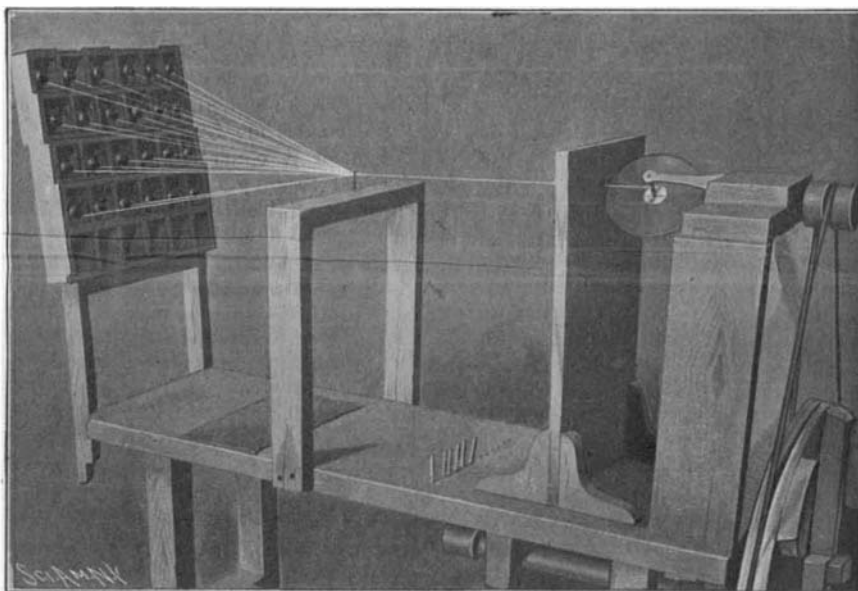
The spiders thus undergo a complete reeling without resistance, and when they are “empty” they are re-



**SPIDERS IN THE GUILLOTINE REELING-BOXES.**

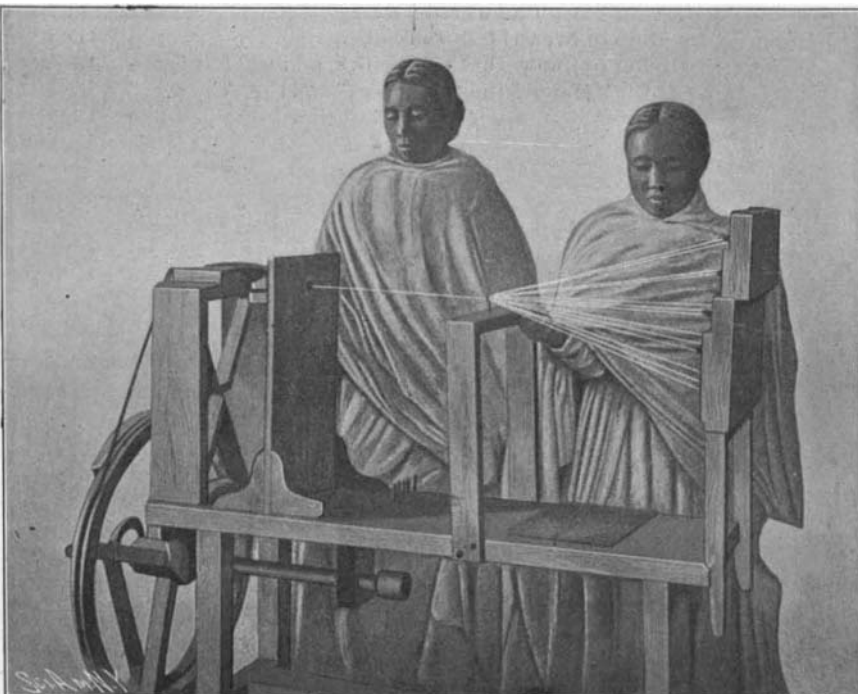
placed by others. Those which have been operated upon are placed for convalescence in a “park” constructed for the purpose and consisting of bamboo planted in the ground and connected by strings so as to form trellises. After a few days' rest in these, those that have not been devoured are taken out in order to be submitted to another reeling.

The silk of the Halabés is of a wonderful color. A



**THE REELING APPARATUS.**

thread of gold could not be more brilliant nor of a purer yellow; but no attempt has been made to wash these threads prior to their being woven, as is done with silk worm threads, and perhaps such washing might remove this brilliant natural color. But there would remain the tenuity, elasticity and tenacity, which, it is said, are much superior to those of ordinary



**THE OPERATION OF REELING.**

silk; and this would permit of the manufacture of wonderfully fine fabrics of extreme flexibility and of a strength destined to defy ages.

The merit of this original discovery is due to Father Camboné, a Catholic missionary in Madagascar, who was the first to endeavor to turn the thread of the silk-producing spider (*Nephila Madagascarensis*) to account. Like the Malagashes, he contented himself in the first place with collecting the innumerable webs of the spiders that abound in the gardens of the Mission, and in carding and spinning them. He wove fabrics that were absolutely unwearable and of a coarse aspect, owing to the irregularity of the threads. He then endeavored to improve his thread by reeling it directly from the abdomen of the spiders, which he inclosed in match boxes, and was thus the inventor of the process now employed at the Professional School of Tananarive. Nevertheless, it appears that Reaumur attempted the reeling of the threads of living spiders in 1710, in operating upon the *Epeiræ* of France, arachnids of small size, of which, according to his calculations, it would require 700,000 to yield a pound of silk.

But I doubt whether the echo of such researches ever reached the ears of Father Camboné at Madagascar, any more than the experiments of Raimardo Maria de Tremayer in Spain or of Aleide d'Orbigny in America; so, we may, without injustice, allow the good Father all the merit of his discovery. It is, therefore, to him alone that the traveling spiders which the government is going to send from Madagascar to Paris on board of comfortable packet boats of the Messageries Maritimes, for operating before the international eyes of the visitors to the Exposition, will have made this glorious trip. Thanks to him, they will become acquainted with the mildness of our climate and the succulence of the French flies that will be officially served up to them at their meals.—G. Courtellement, in *Le Monde Illustré*

**Process for Preserving Wood.**

Mr. Fritz Hasselmann has invented a process for preserving wood. It is called the xylosete process, and consists in boiling the wood in a solution of metallic and mineral salts, under a pressure varying from 15 pounds to 40 pounds per square inch. The solution is composed of the sulphates of copper and iron crystallized together in the proportion of 80 per cent of copper and 20 per cent of iron, alumina, and a salt which is mined at Stassfurt, in Germany, called “kanit.” This latter chemical is a compound of sulphate of potash and magnesia and chloride of magnesia. The properties that this solution exercises upon the woods so treated are the withdrawal of the sap and its dissolution with the liquid, the destruction of the germs of decay by the action of the copper, and a chemical formation, by the iron, which is insoluble in water, with the cellulose or woody fiber. Several experiments have been carried out with wood which has been treated by this process near Vienna. The treated wood was utilized as props in the vineyards and never displayed the slightest tendency to decay. Sleepers treated by this process have also been employed on the Bavarian government railways, and it has been found that even the softest woods are rendered as strong and as durable as oak by the solution.

**The History of Babylon.**

We may soon, says *The Literary Digest*, be in a position to study the lost history of Babylon, as we can now study that of Greece and Rome. In a recent lecture at the Industrial Art Museum at Berlin, Prof. Delitzsch, the celebrated Orientalist and explorer, stated his hope, says *Biblia* (June), “that in a short time it will be possible to reconstitute the history of Babylon from its monuments. Contemporary inscriptions on monuments show that the excavators are unearthing the relics of a prehistoric epoch antecedent to the period to which we assign Abraham. The list of kings will furnish an excellent foundation for the historical reconstruction of the epoch.”

This has been made possible by the discoveries of the expedition sent out by the German Oriental Society under the direction of Koldewey. Nebuchadnezzar's favorite temple has already been explored, and the excavators are now attacking “the edifice proper, in which Cyrus signed the edict authorizing the return of the Jews to their own land, and in which Alexander died.”

In the Palace of Optics at the Paris Exposition 800 or 900 vacuum tubes are used, producing a remarkable effect.