

of silver between the heads of the two rods, and it melted in an instant; then another piece of metal (they claim that fire has nothing to do with it), and that melted too. If one of the two pieces of copper touches the other, fire comes out between them like lightning. One of them took it in his hand wet with saliva, and the veins of his hands shook so, he had to drop it. When they removed the pieces of copper from the device, [the shaking] stopped. This device was [made of] small metal dishes all joined together with bits of copper. I wonder if the explanation is in those dishes.

The most remarkable and strangest thing we saw here was a force that carries news from one place to another in an instant with complete clarity and accuracy, even if the two places are far apart, because it is done with writing.⁴⁶ The way they did it was with a disk of brass like the face of a clock, engraved with all the letters (and the vowels too, because the vowels are letters for them). This disk was firmly fixed to a stand, which had as many holes in its sides as there were letters, a hole under each letter. Across from it was another disk, lying flat, that was also marked with all the letters, with a pointer at its center. The two disks were connected by two wires that vibrated. If one person wished to talk with another, he would turn the first disk so that the needle lodged in the hole below the letter [desired]; the pointer on the second disk would stop at the same [place]. So it went until the words were complete and perfectly understood—all with the greatest speed. They claim that the force between these two disks can carry words instantly from one place to another. Even if there were thousands of hours of travel time between them, it would take just a second, that is, one-sixtieth of a minute.

This device completely staggers the senses, but one who has seen

46. At that time the electrical telegraph was still in its infancy. In 1844, the Chambers voted funds to establish the first telegraph line between Paris and Rouen, but it was not opened for public use until 1851. *Grande encyclopédie Larousse*, 1886 ed., s.v. "Télégraphe"; Pinkney, *Decisive Years*, pp. 58–59.

it with his own eyes will not doubt it. We tried it ourselves with a few words and could not move our eyes from one disk to the other before the pointer stood at the correct letter. They claim that they have set this up between Paris and Orléans, a distance of ninety miles, and also between the Chamber where they gather to make their laws and the palace of the Sultan, by means of a device hidden underground with an attendant at each end. They talk to the Sultan from the Chamber while he is in his palace, and he answers them, although they are a great distance apart. Here is an approximate drawing of all of it:

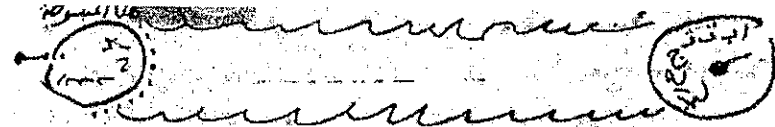


Figure 2. The telegraph.

This is everything we saw in that place.

The House of Printing

On Thursday, the twenty-third day of the month, we went to the house for printing books called the *aṣṭanbā*,⁴⁷ which is another of

47. The Imprimerie Royale. *Aṣṭanbā* comes from the French *estampe* (Spanish *estampa*), or printing press. Secretary and man of letters, aṣ-Ṣaffār not surprisingly paid rapt attention to the mechanical printing press. The first Moroccan press was a lithograph workshop set up in Fes in 1864, where works of a primarily religious nature were printed. The first typographical press appeared in Tangier in 1880, but typography was not generally used for Arabic books until early in the twentieth century. For the history of printing in Morocco, see M. Al-Manūnī, *Mazāhir* 1:201–51; G. Ayache, "L'apparition de l'imprimerie au Maroc," *H-T* 5 (1964): 143–61; and Fawzi A. Abdulrazak, *The Kingdom of the Book: The History of Print-*

their amazing crafts. First of all, you should know that the letters are cast in tin, thick at the bottom and narrow at the top. Some letters are single, and others are made of two letters joined together. [The printer] takes the letters he wants and puts them in a frame the size of the page to be printed, setting them in straight lines like writing. The letters are held tightly with a clamp that keeps them in order. Then they coat them with ink and lay a sheet of paper over them, pressing it down firmly by means of a vise. When the paper emerges, it is completely covered with writing. This is a general description of it. Now let me tell in detail about what we saw in this place.

First we entered a room with an oven where the workers cast the letters in copper molds the size of the type; the letter is engraved on the bottom of that mold, like the letter *sīn*, for example.⁴⁸ When the melted tin comes out, the letter at its head is reversed, but when they print with it, it comes out straight like any stamp. These workers cast letters in many types, both Arabic and non-Arabic. In the next room there were many workers, more than in the first; their task was to straighten and polish the letters, removing the bumps so that they would fit smoothly together in the frames. There were others who sorted the letters into compartments, one for each letter.

Next came the room of the typesetters.⁴⁹ Sitting before the book to be printed, the typesetter takes the frame and arranges the letters in it just as they are on the page. He sets down the first line on a metal rule and puts it in the frame, then he composes the second line, and so on until he fills [the frame]. Even if he does not understand the writing and cannot read it, he knows its equivalent in

ing as an Agency of Change in Morocco between 1865 and 1912 (Ph.D. dissertation, Boston University, 1990). A complete list of Fes lithographs is found in Fawzī 'Abd ar-Razāq, *Maṭbū'āt al-ḥajariya fil-Maghrib* (Rabat, 1989).

48. A little sketch of the Arabic letter *sīn* as it appeared on the mold is drawn in the text.

49. *Nassākh*; "copyist" or "scribe," but from the context, a typesetter.

type. We tested one of them by writing out a line [in Arabic], and he set it down exactly. We told him to break it up, which he did, and there were thirty-four letters. Then he returned each to its place swiftly and without a mistake. This completely astonished us.

Once the type is set in the frames, it goes into the hands of others. We entered a room in which there were large open tanks of water with bundles of paper resting on their edges. Here they soak the paper in water, four or five pages at a time, and set it on the edge of the tank to drip off. Then it goes into another room with machines and rollers worked by a fire you cannot see which dries the papers. Each machine is run by three women workers: one puts the [wet] paper into the rollers, another turns the rollers, and the third takes it out, completely dry from the heat of the fire inside.

Then the sheets of paper and the frames go to the printing room, where there are two types [of printing]: one is by hand, the other by rollers. The first requires three people. One worker takes the frame with the letters and sets it in place. The next has a piece of leather in his hand, folded over several times and coated with ink, which he passes over the letters to blacken them. Their ink is not liquid like ours but gives color nevertheless. The first worker then takes a blank sheet of paper, putting it on a second frame which is pressed down on the letters from above by means of a heavy iron device that moves with a turning motion. Then they open it up and out comes the printed sheet, which a third worker removes. With these letters they can print as many pages as they want, a hundred, a thousand, or ten thousand, all exactly alike. They do the same for every page, until they reach the last page of the book. The day a book is completed, it may come out in a thousand copies. If all the necessities are on hand, and no difficulty is encountered in the printing, two hundred or more pages can be printed in a single hour.

The other type of printing is with rollers, sometimes turned by hand, at other times turned by steam power or by running water like a mill. [A worker] takes the sheets and feeds them into the rollers, which swallow them up until they pass over the letters and

emerge printed. The leather that takes up the ink and blackens the letters works by a moving force, not by hand. With the first turn, the paper comes down on the letters and is printed, and with the second, ink is put on [the letters] to blacken them [again]. Everything happens in one continuous movement. When the printing is completed, the letters in the frame are broken up and new letters are set to print a different page. However, they leave some books set in their entirety, so that when they want to print them again they do not have to bother with resetting the letters. We saw rooms with frames [containing] books set in type.

After a book is printed it must be bound, and that too is a craft there. They take it into other rooms where they trim the margins of the pages by means of steam power, which operates the knives. In another room they gather the papers in a bundle between two boards, and press them from below with an iron bar moved by water power. Yet another room is for binding. [In sum,] paper enters this place blank and comes out a bound book.

The most amazing writing machine we saw there was a special way of printing a book regardless of the writing, be it Arabic or non-Arabic, eastern or western [script], or whatever. They do this by taking a sheet written on with special ink that is reddish, like the dye from walnuts. Then they fasten it to a stone. When they open it up, the writing appears on the stone just as it was on the page. With this stone they print as many pages as they like; all of them emerge exactly like the original, without additions or subtractions, corruptions or alterations. I wrote a line with that ink on a piece of paper, which they then placed on a stone, and the writing became imprinted on it. Then they printed other pages from the stone, which came out exactly like the first page. [In this way] one can print an entire book in whatever handwriting one wishes.⁵⁰

50. This is the lithographic process. Traditional scholars admired it because it avoided the step of typesetting, and so reduced the chance of errors entering the text; at the same time, it did not sacrifice the individuality of the scribal hand. 'Abd ar-Razāq, *Maṭbū'āt*, p. 8. Also see n.47 above.

The total number of workers employed in that establishment was eight hundred, and they work continually, without a stop. One wonders, where do all these books go? But everything there is recorded in books; no place is without them. They take down information and benefit from it, not depending on memory for fear of forgetting it. As it is said:

Knowledge is the prey, and the book its snare;
Tie down your quarry with a strong rope.
Ignorance is trapping a pigeon
And leaving it unfettered with maidens.

And something that is said about books:

When you sit with my companion, he relieves
Your heart of pain and suffering.
He gives you knowledge and adds to your wisdom.
Not jealous or given to hatred,
He keeps faithfully what is entrusted to him,
Not betraying his trust with the passage of time.

And another said:

While others sit in their houses
With limpid wine and women with lovely breasts,
And fate has been good to them,
Bringing noble friends and torrential rain,
I sit alone with my companions, books of knowledge,
And spend the night with my bride, daughter of a book.

And another said:

When I left my friends,
And my notebook was my sole companion,
I did not lack the finest poet,

A scholar who was devoted and faithful.
There was wisdom between its two covers,
And benefit for the seeker and thinker.
If at times my heart was constricted with happiness
I consigned my secret to it, keeping it unseen.
When poetry proclaimed the name of my love,
I was neither embarrassed nor speechless before it.
When I responded to anger with mockery
That provoked the Caliph, I was not afraid.
I need no other companion.
We are friends, until the Day of Judgment.

And another said:

I got used to solitude during my life,
With no friends in all the world.
I made my notebook my comrade and companion
At the table, instead of a friend.
I have no need for a horse or an unruly mule
When I voyage, for I have my feet.
My lap is my table, my pockets are my saddlebags,
My girdle and purse are always with me.
My abode is wherever the heavens shelter me,
And my family all have rare good sense.

This is everything relating to the printing press.

About two days later we went to a place they call the "Panthéon,"⁵¹ a very tall building with a very lofty dome about four hundred cubits high from which all of Paris can be seen; from it people on the ground look like small children. Their great ones are buried

51. Built in the eighteenth century as a church, the Panthéon was rededicated during the Revolution to the ancient gods. The huge crypt beneath it became the resting place of many of France's great men.

there inside stone boxes in underground chambers, with the boxes sealed over them. On the side of the box is an urn containing the heart of the dead one; they remove it and coat it with something that preserves it, and then put it into the urn and hang a sign on it saying it was his heart. Here too are huge statues of humans, and one of them was carrying a crown. They claimed it was an image of Fate. When one of their kings dies, [Fate] removes his crown and places it on another; kings grow old and die, but [Fate] never dies. In the hand of another [statue] was a sword, and they claimed it was the Day of Judgment.

One of the stories they tell [about the Panthéon] goes like this: In one corner is a hole that opens into the crypt. If the custodian puts his mouth to it and calls out to the dead, an echo will answer from underground, saying, "How are you?" If he says, "Well," the echo will answer, "Well," as if the dead were answering him; but he is really answering himself by himself. If he drums on a piece of hide, a great noise like thunder is heard underground, as if the dead had cannon down there and were firing them.

Some days later they insisted that we go to two palaces of the Sultan outside of Paris, one of them in the village called Saint Cloud and the other in a village called Versailles. Both are close to Paris, and are strongly built palaces surrounded by enormous gardens with graceful trees, gushing streams, and fountains with statues spouting jets of water. In one of them we saw a table of marble they claimed was a piece of wood which stayed in the water until it became marble. That for them is a special kind of wood. They take great care with plantings, especially along the pathways, where they trim and prune the trees so that they are even with each other both above and below. They also set down benches and make open places [for sitting]; they have houses in the gardens where the plants stay during the cold weather. [These gardens] are of such vast extent you would think they went on forever.

Among the objects we saw in the palace of Versailles were paintings of wars from the beginning of time to the present; but they

only show the wars in which they were victorious. [An anecdote:] They tell the story about a man who walked through the marketplace and saw people gathered around the picture of a man overwhelming a lion. He went on until he met a lion, and he told the lion what he had seen. The lion said to him: "If the lion knew how to draw, you would see what he would do; but since he does not know how, then each one draws what he pleases."

We saw likenesses of their notables and great men, their sultans, heroes, and priests; some were carved in stone and others were drawn. We saw painting[s] of their entry into the cities of Algiers and Constantine, and a picture of their victory over all those lands; a likeness of the Ottoman Sultan 'Abd al-Majīd,⁵² and one of Muḥammad 'Alī, the Pasha of Egypt. This castle is built of the finest-colored marble. Some rooms there belonged to Louis XVI,⁵³ and when he died they remained exactly as they were, with his furnishings, bed, chairs, crown, and chapel preserved down to the very last detail.

The Chamber[s]

On the 14th of Šafar we went to the two Chambers, the Great and the Small.⁵⁴ The Chamber is the house where they gather to fashion

52. The reigning Ottoman Sultan. *EI* 2, s.v. "'Abd al-Majīd I."

53. King of France who, together with his wife Marie-Antoinette, died on the guillotine of the Revolution. *Dictionnaire d'histoire de France* Perrin, 1981 ed., s.v. "Louis XVI."

54. Chamber is *qamra*. The Great was the Chamber of Peers, the Small the Chamber of Deputies. The former met in the Palais du Luxembourg, the latter in the Palais Bourbon; aṣ-Šaffār says he visited both. Most of this passage on the conduct of government is taken from aṭ-Ṭaḥṭāwī. *Takhlīṣ*, pp. 93–106; *L'or*, pp. 132–39; aṣ-Šaffār even adopts aṭ-Ṭaḥṭāwī's term *malik* ("king") instead of his usual *sulṭān*. The *charte constitutionale*, granted by King Louis XVIII in 1814 and revised in 1830 by Louis-Philippe, kept a

their laws and talk over their affairs. The place where they gather is domed and is built like the theater, with an inclined floor and rows of chairs. The reason for the slope is so that everyone can see what is in front of them. At one end there is a raised platform shaped like a *minbar*⁵⁵ except that its steps are at the side.

Whoever wishes to speak mounts this platform, looks out over those who are seated, and says his piece. Everyone seated has pen, ink, and paper. The speaker talks and they write it down. Then he sits down and they reflect on his words, either accepting them or rejecting them. If one of the listeners is opposed to the words of the speaker, he may rise from his chair and discuss it with him, but if the objection is a lengthy one, then he waits his turn, mounting the dais to speak. Behind the speaker are three people whose task is as follows: if the talk goes on too long, they may pass judgment and terminate the discussion.

According to a law recognized there, when it comes to choosing one of two sides [in a debate], the decision is in favor of the majority. That is, when ten people say such-and-such, and twenty are opposed, the decision is in favor of the twenty. This is true even if one side is greater by only a single person. This is the practice in the Small Chamber too.

The difference between the two [Chambers] is as follows: The Great Chamber protects the interests of the King and the great [men] of state. Among its tasks are the renewing of defunct laws and the continuation of existing laws. The Small Chamber stands for the people, champions its [causes], and asserts its rights when it is in conflict with the other. A member of the Great Chamber must be twenty-five years of age, but he does not have the right to speak until he has reached thirty, unless he is a relative of the king. In that case, he attends from a very young age, but without the right to

limited suffrage and favored the nobility and propertied classes. *Grande encyclopédie Larousse*, 1972 ed., s.v. "France."

55. The pulpit of the mosque and the place from which the Friday sermon is delivered.