

ORGANIZATION AND ADMINISTRATION OF EUROPEAN TELEGRAPHS.

CHAPTER LVI.

The Telegraph in France—Decrees permitting the Public to Telegraph—Regulations on receiving and transmitting Dispatches—Conditions of Admission of Supernumeraries—Programme of Preparatory Education required of Candidates.

THE TELEGRAPH IN FRANCE.

THE French government was about the first on the continent to adopt the semaphore telegraph, the invention of the Brothers Chappe. For many years the efficiency of this means of communication was experienced. As soon as the electric telegraph became a demonstrated and practical system, France was foremost in Europe to avail itself of its wonderful means of transmitting intelligence.

The permanent secretary of the Academy of Sciences, M. Arago, did much to procure its early adoption by the government. In 1838, Louis Phillipe, the king of the French, prohibited Prof. Morse from constructing a line of his telegraph, but, in a few years after, the advantages of the electric system over the semaphore were acknowledged, and lines were soon spread throughout the kingdom, built and managed by the government. I deem it unnecessary to follow the progress of the lines in their construction, and I shall, therefore, consider the system in that country as it is at the present time.

DECREES PERMITTING THE PUBLIC TO TELEGRAPH.

The imperial government of France has, from time to time, issued decrees regulating the use of telegraphing in the empire. The following is a digest of some not embraced in the rules issued by the Minister, concerning the operation of the lines :

1st. All persons whose identity is established, are allowed to correspond by the government electric telegraph, by the agency of functionaries employed in that department.

2d. Private correspondence is always subordinate to the necessity of government service.

3d. Dispatches are to be written in *ordinary and intelligible language*, dated and signed by the sender, and to be given to the officer of the telegraph station, whose duty is to copy in full the dispatch, with the address of the sender. This copy is to be authenticated and filed in the office. Articles for newspapers and dispatches on railway business are to be exempt from the copying rule.

4th. The director of a station may, on grounds of public order and morality, refuse to transmit a dispatch. In case of dispute, reference is to be made in Paris to the minister of the interior; in the provinces, to the prefect, sub-prefect, or other constituted authority. On the receipt of a dispatch, the director of the station may withhold its delivery for like reasons.

5th. Private correspondence may be suspended at any time by the government. The government will not assume any responsibility for errors in the transmission of dispatches.

6th. Any public functionary violating the secrecy of correspondence is liable to the penalties prescribed in Art. 187 of the Penal Code, viz.: imprisonment from three months to five years, fine 100 to 500 francs, and total exclusion from public service.

7th. Dispatches affecting the safety of passengers on railway trains, in all cases, take precedence of every other business.

8th. The director of the station must be satisfied as to the identity of the sender's signature. Identity may be proved by witnesses, passports, or other written evidence. The signature may be proved by prefects, sub-prefects, magistrates, notaries, mayors, commissioners of police, &c., &c. If the director sees reason to refuse the transmission of a message, he must state his reason in writing on the dispatch, and return it to the sender. [He may endorse on it, "political," "offensive," "not consistent with public good," &c.]

9th. No line of electric telegraph can be established or employed for the transmission of correspondence except by the government, or on its authority. Any person transmitting, without authority, signals from one place to another, whether by electric telegraph, or in any other way, is liable to imprisonment from one month to a year, and a fine of 1,000 to 10,000 francs, and the government may order the destruction of the apparatus and telegraph employed.

10th. Any one *accidentally* and *involuntarily* interrupting the correspondence of the electric telegraph, or injuring in any way the lines or apparatus, is liable to a fine of from 16 to 300 francs.

11th. Any one willfully causing an interruption by injuring the lines or apparatus, is punishable by imprisonment from three months to two years, and a fine of 100 to 1,000 francs. Any one who shall make a forcible intrusion into an office, or shall use violence or menaces to signalers, or interfere with the repairs of the line, during periods of insurrectionary movements, is subject to a fine of 1,000 to 5,000 francs.

12th. Written statements by telegraph officers, authenticated by police or magisterial authorities, to be received as evidence in all complaints; also rules are given for civil proceedings in all cases of crimes, contraventions and recovery of damages.

13th. It is ordered, by a subsequent decree, that all telegraphic dispatches, duly authenticated, are to be regarded as official and authoritative, and to have all the force and effect of public documents, signed by the functionaries at the distant station from whom the telegraph dispatch proceeds.

The telegraph lines in France are nearly all owned and managed by the government. The English Submarine Company, however, is a private enterprise, and works from Paris, through Calais, to the United Kingdoms. There is also another company organized under permission of the imperial government, for the extension of the lines into the French colonies of Africa. This association is called the Mediterranean Electric Telegraph Company, and it has constructed its line from Spezia, in Sardinia, across Corsica, Sardinia, and the Mediterranean Sea, to Bône, in Africa; the governments of France and Sardinia guaranteeing a fixed percentage on a given amount of its capital stock. The lines just mentioned have a separate office in the city of Paris, and receive and send their own dispatches. Messages for these lines, however, can be left at the government stations.

The following rules of regulation are for the government of the respective lines worked by the French government:

REGULATIONS ON RECEIVING AND TRANSMITTING DISPATCHES.

1. Every message received at an office is to be numbered in the order of its reception, commencing January 1st, and continuing thereafter in regular order through the year.

2. The number of the message, and the sum received, are to be transcribed on a check-book containing the following forms:

other, or on local lines in other cities, is one franc. From and to places not over twenty kilometers from Paris, one franc and fifty centimes.

16. The charge for each additional series of five words, or a fraction thereof, over the fifteen words, is to be charged at an increase of ten per cent.

17. No charge for delivery of dispatches.

18. Every fraction of a myriameter is counted as a whole. The distance is taken on an air line on the map.

19. The following are the rules for counting words, viz.: 1st. Compound nouns, formed of separate words in the dictionary of the French Academy, such as chief-director, station-master, &c. 2d. Geographical and family names formed of several words, not including in the latter title and Christian names. Each word or name in a business firm is chargeable. 3d. Name of a street is charged as one word, the locality described is one word. This rule applies only in the address. Numbers written in full, count as many words as are used to express them. In counting figures five make a word, and the fraction additional counts as a full word. A comma or a bar of division counts as a figure, thus 327,50 count as two words, $3,2\frac{1}{2}$ two words, the $\frac{1}{2}$ being counted as three and the comma as one figure; $4,32\frac{1}{2}$ count as two words; and 33.50, are counted as six figures or two words, there being four figures and two points additional.

20. Points of punctuation in the common language and orthography are not chargeable. Parenthesis, italization, and quotation-marks, are counted two words for each. Letters separated or in groups are regarded each as a word. All signs and marks are counted as many words as are required to express them respectively; thus, A in a diamond, counts as four words.

21. Messages for several stations are to be charged as follows: If the dispatch is to be sent from station A to B and C, the tariff charged at A will be for the transmission from A to B, and then the tariff from B to C is to be charged on the message to be dropped at C, and in like manner to any number of stations desired.

22. When a dispatch is addressed to several persons in the same town the charge for transmission is to be on one dispatch only, but on every duplicate delivered to other persons, the cost of delivery will be charged, and for the copying a charge of fifty centimes will be required for each.

23. Any one wishing a copy of a dispatch either sent or received by the person, a charge of fifty centimes will be required for copying it, and for which a receipt will be given by the officer of the station.

24. Any one wishing information of the time of the delivery of a dispatch transmitted by such person, or the time of its reception at the destination office, a charge will be made, equal to one fourth the price of a dispatch to said place. For this payment a receipt will be given.

25. For having a message repeated back to the sender, full tariff will be charged, as though it was a new dispatch.

26. The charge on dispatches sent in the night will be double the usual tariff for the day business. The night hours are from 9 p. m. to 8 a. m., during the winter months, and from 9 p. m. to 7 a. m., during the remainder of the year.

27. Answers paid for in advance, are to be charged at the rate of a single dispatch, but if the answer should exceed the payment made, it cannot be delivered until fully paid. If no answer be sent, the money will be returned.

28. When anyone to whom a message is sent does not live in the locality of the destination office, the sender must indicate the mode of its delivery, for which the following charges shall be made, viz.: For delivery at post-office half franc, plus forty centimes for postal registration; for

sending by express, one franc for the first kilometer and fifty centimes for each additional kilometer; for sending by courier express three francs and seventy-five centimes for the first kilometer, and for each additional kilometer thirty-seven and a half centimes.

From the preceding rules it will be seen that the tariff of charges on the lines in France, depends upon distance. On the reception of a message a charge is made, in the nature of a fee. This charge is 2 francs on each dispatch. Besides this, a charge of 10 centimes is made for each myriameter of the distance the message is to be sent. On a message from Paris to Marseilles, a distance of 67 myriameters, or about 400 miles air-line, the charge will be 8 francs and 76 centimes. The minimum of a message is fifteen words. Over fifteen words, for each series of five words or less, the charge is the full tariff of the 15 words, and in addition ten per cent.

To determine the tariff from any one place to another, a tape measure is placed upon the map of France, between the two points. The measure has marked upon it the myriameters, and thus in a right line the distance is known. The tariff is then estimated upon the distance thus acquired.

CONDITIONS OF ADMISSION AS A SUPERNUMERARY, INTO THE ADMINISTRATION OF THE TELEGRAPH LINES.

(Enforced by Ministerial Decree.)

ART. I. The personnel of the administration of the telegraph lines, is recruited by means of a competition among the candidates for the places of supernumerary station-masters. One third of the places, however, are reserved for discharged military men of all grades, who can read and write, and are less than thirty years of age.

ART. II. The competition for said positions takes place at Paris whenever the telegraph service requires.

ART. III. Candidates must be not less than 22 years of age, nor more than 28 years, and must prove their rank as Frenchmen.

ART. IV. At least one month before the time of competition, they must furnish the following evidences, viz.:

- 1st. Their certificate of birth.
- 2d. Certificate of discharge from military service.
- 3d. Certificate of good moral character.

ART. V. They must furnish satisfactory evidences of their knowledge of the following, viz.:

- 1st. The mode of making out official reports.
- 2d. Linear drawings.
- 3d. Arithmetic as far as proportions.

- 4th. Elementary geometry.
- 5th. Elements of chemistry.
- 6th. Elements of natural and physical sciences, especially in static and dynamic electricity.
- 7th. The drawing of plans.
- 8th. Leveling.

ART. VI. The knowledge of one or more of the following languages, viz. : German, English, Italian, and Spanish, will be a great consideration in the classing of the candidate.

ART. VII. The director-general of telegraphs will preside over the examining committee, which will be of one inspector-general, director-general, and two inspectors.

ART. VIII. The director-general of the telegraph lines is charged with the execution of the above decree.

PROGRAMME OF PREPARATORY EDUCATION REQUIRED OF CANDIDATES
FOR THE PLACE OF SUPERNUMERARY.

(Fixed by Ministerial Decree.)

I. ARITHMETIC.

1st. Decimal numeration. 2d. Addition and subtraction of whole numbers. 3d. Multiplication of whole numbers. 4th. The product of several whole numbers not changed by inserting their factors. 5th. Division of whole numbers. 6th. To multiply or divide a number by the product of many factors, it is sufficient to multiply or divide successively by the factors of the product. 7th. Theory of prime numbers. 8th. Decomposition of a number into its prime factors. 9th. Greatest common divisor. 10th. Smallest number divisible by given numbers. 11th. Vulgar fractions. 12th. Operations with vulgar fractions. 13th. Decimal numbers. 14th. Operation with decimal numbers. 15th. To reduce vulgar fractions to a decimal, and *vice versa*. 16th. System of legal measures. 17th. Formation of squares and cubes with whole numbers, or vulgar or decimal fractions. 18th. Extraction of square and cube roots. 19th. Theory of proportions. 20th. Rule of three. 21st. Simple interest. 22d. Rule of fellowship. 23d. Allegations alternate and medial.

II. GEOMETRY.

1st. Right line and plane. 2d. Broken line and curved. 3d. Angles, triangles, and equilateral triangles. 4th. Parallel straight lines. 5th. Parallelograms, and the properties of their sides, angles, and diagonals. 6th. Circumference of the circle, chords and arcs. 7th. Condition of contact in intersection of

two circles. 8th. Measurement of angles—inscribed angles. 9th. Problems in the construction of triangles. 10th. Drawing of perpendicular and parallel lines. 11th. Use of the square and protractor. 12th. Verification of the square. 13th. Proportional lines. 14th. Similar triangles and similar polygons. 15th. To divide a given right line into parts proportional to the length given. 16th. To construct upon a given right line a polygon similar to a given polygon. 17th. Regular polygons. 18th. They may be inscribed and circumscribed by a circle. 19th. To inscribe a regular hexagon. 20th. The ratio of a circumference to its diameter, a constant number. 21st. Approximate valuation of the ratio of the circumference to the diameter. 22d. Measures of areas. 23d. Areas of similar polygons. 24th. Areas of a circle of a sector of a segment of a circle. 25th. Two right lines which cut each other—define a plane. 26th. Condition in which a right line is perpendicular to a plane. 27th. Parallelism of right lines and of planes. 28th. Measurement of problems of dihedral and trihedral angles. 29th. Of the parallelepipedon and its measurement. 30th. Pyramids and their measurements. 31st. Contents of a frustum of a pyramid. 32d. Of similar polygons. 33d. Of cones and cylinders with circular base. 34th. Lateral surface. 35th. Contents of bodies. 36th. Spheres. 37th. Areas of a zone. 38th. Areas of a whole sphere. 39th. Contents of the sphere section of a whole sphere.

III. ENGINEERING.

1st. To trace a right line upon the ground. 2d. Measurement of a portion of a right line by means of a chain. 3d. Measuring by the metre. 4th. Drawing of perpendiculars. 5th. Use of the surveyor's square. 6th. Graphometer and its use. 7th. Drafting. 8th. Scale of reduction. 9th. Drawing by the plane. 10th. Sketching.

IV. PHYSICS.

1st. Comparison and measurement of forces. 2d. Weights and measures. 3d. Equilibrium of liquids. 4th. Principle of the transmission of pressure. 5th. Measurement of density. 6th. Areometer. 7th. Atmospheric pressure. 8th. Barometer. 9th. Pneumatic machine. 10th. Aerostat. 11th. Heat and dilation. 12th. Construction and use of thermometers. 13th. Density of gases. 14th. Freezing mixtures. 15th. Measurement of elastic forces. 16th. Of steam at different temperatures. 17th. Mixture of gases and vapors. 18th. Hygrometer. 19th. Rain and snow. 20th. Regular and

irregular winds. 21st. Fog and dew. 22d. Electricity. 23d. Conductors, non-conductors and power of points. 24th. Electricity by induction. 25th. Electroscope. 26th. Electric Machines. 27th. Electric batteries. 28th. Leyden jar. 29th. Electrometers. 30th. Thunder. 31st. Lightning rods. 32d. Return currents. 33d. Magnets. 34th. Poles of magnets. 35th. Process of magnetization. 36th. Armature of magnets. 37th. Magnetic needle. 38th. Magnetic meridian. 39th. Declination and inclination. 40th. Terrestrial magnetism. 41st. The compass. 42d. Batteries, and of their different kinds. 43d. Their organization. 44th. Theory of the batteries. 45th. Luminous and calorific and mechanical effects. 46th. Chemical effects of batteries. 47th. Galvanoplastic. 48th. Silvering and gilding. 49th. Decomposition of water by means of the battery. 50th. Dry batteries. 51st. Electro-magnetism. 52d. Deviation of the magnetic needle by means of a current of electricity. 53d. Attraction and repulsion of a magnet by means of a current of electricity. 54th. Galvanometer or multiplier. 55th. Currents produced by ordinary electricity. 56th. Magnetization by means of currents of electricity. 57th. Magnetization of soft iron by means of a current. 58th. Operation of magnetism in motion. 59th. Thermo-electricity and its theory. 60th. Electrical action of Daniel's and Bunson's batteries. 61st. Conductibility of metals. 62d. Laws of the intensity of the current in a homogeneous circuit, and also in a heterogeneous circuit. 63d. Intensity of currents and the laws of deviation.

V. CHEMISTRY.

1st. Simple bodies. 2d. Compound bodies. 3d. Nomenclatures. 4th. Acids, bases, and salts. 5th. Oxygen. 6th. Combustion. 7th. Azote. 8th. Atmospheric air. 9th. Hydrogen. 10th. Water. 11th. Carbon. 12th. Carbonic acid. 13th. Carbonized hydrogen. 14th. Gas for lighting. 15th. Azote gas. 16th. Amonics. 17th. Sulphur. 18th. Sulphuric acid. 19th. Sulphurous acid. 20th. Sulphuretted hydrogen. 21st. Phosphorus. 22d. Phosphoric acid. 23d. Phosphoretted hydrogen. 24th. Chloride. 25th. Chlorhydric acid. 26th. Salts in general. 27th. Laws of Berthollet. 28th. Calcareous earths. 29th. Hydraulic limes. 30th. Mortars and plasters. 31st. Potash. 32d. Soda. 33d. Sulphate of soda. 34th. Marine salts. 35th. Iron, zinc, tin, copper, and mercury, and their salts. 36th. Sulphate of copper. 37th. Of silver, gold and platina, and the character of their salts. 38th. Theory of metallurgy. 39th. Theory of mining, etc.