the period of swing will be different, and the time taken to make a complete swing will increase or decrease as the equator is approached or receded from. So much for theoretical considerations. Can they be put to the test of experiment, and an answer obtained from nature herself? The fact is that this idea of Foucault's is so beautifully simple that anybody can make the experiment providing he has the means of using a very long pendulum. This pendulum must be rigidly, but at the same time very independently, supported.

Beneath the pendulum, in contact with the earth, and therefore showing any movement of rotation which the latter may possess, is a board, on the centre of which the pendulum nearly rests. From the central point of this board lines are described showing so many degrees from the central line over which the pendulum bob swings. These preliminaries being arranged, let the pendulum be started. This is done by drawing it out of the vertical and tying it by a thread which is burnt when it is desired to start the experiment.

Then, in consequence of that quality the existence of which was revealed to us by the rotating disk and which is possessed by this vibrating pendulum, and in consequence of the precautions which have been taken to prevent its swing being interfered with by the motion of the earth or other perturbing influences, it should be found, if Foucault's assumption be correct, that the earth is moving beneath the pendulum. And if all the conditions of the experiment have been complied with it is found that the pendulum moves over the scale as the earth rotates beneath it. That then is one demonstration of the existence of the earth's rotation.

The question now arises whether there be any other method of determining the same thing. There is, but in answering the question in the affirmative it must be said that this second method is neither so simple nor so satisfactory as the first.

We owe it also to the genius of this same man, Foucault. It depends upon the same principles and is connected with the same series of facts as the other. But before proceeding to

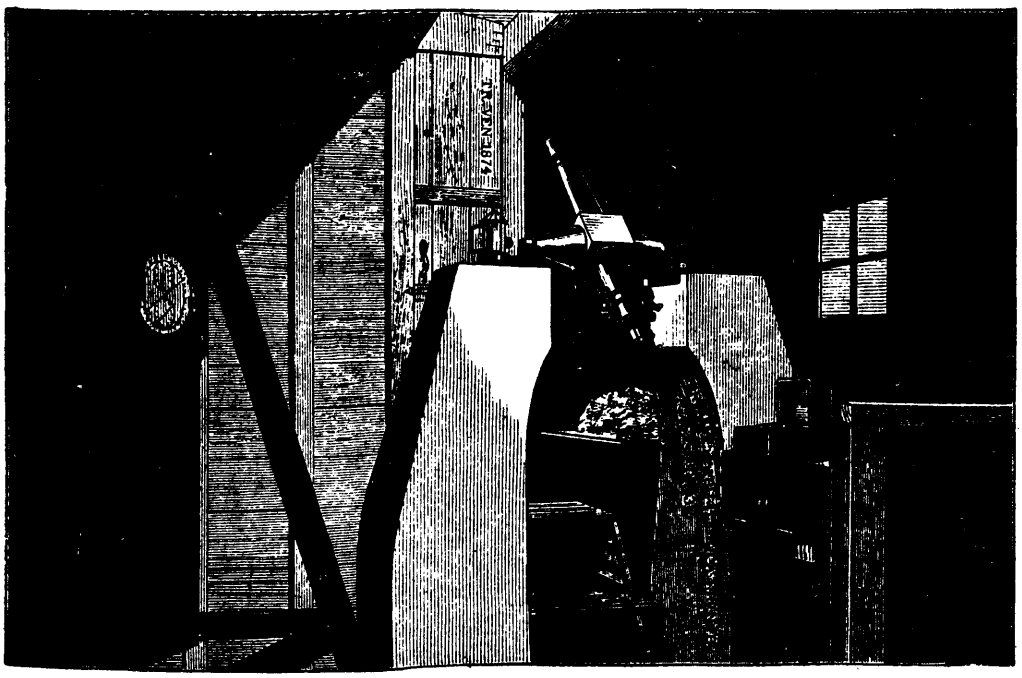

FIG. 30.—Transit instrument and clock.

discuss this second experiment it will be well to consider these two tables, which have been taken from Galbraith and Haughton's "Astronomy," because they show not only what the swinging pendulum should do if it behaves properly, but also what the gyroscope, the instrument used in the second experiment, should do if it behaves properly.

The first table is called

Hourly Motion of Pendulum Plane.

Place	North Lat.	Observed motion per hour	Calculated motion per hour	Observer
	° ′	°	°	
Ceylon	6 56	1·870	1·815	Schaw and Lamprey.
New York	40 44	9·733	9·814	Loomis.
Providence, R.I.	40 49½	9·955	9·833	Carswell and Norton.
New Haven, Ct.	41 18½	9·970	9·929	
Geneva	46 12	10·522	10·856	Dufour and Wartman.
Paris	48 50	11·500	11·323	Foucault.
Bristol	51 27	11·788	11·763	Bunt.
Dublin	53 20	11·915	12·065	Galbraith and Houghton.
Aberdeen	57 9	12·700	12·636	Gerard.

The second is

Rotation of Earth deduced from Pendulum.

Place	Time of Rotation		
	h.	m.	s.
Colombo, Ceylon	23	14	20
New York	24	8	9
Providence, R.I.	23	38	29
New Haven, Ct.	23	50	7
Geneva	24	41	39
Paris	23	33	57
Bristol	23	53	2
Dublin	24	14	7
Aberdeen	23	48	49
Mean value	23	53	9

The pendulum plane is of course the plane in which the pendulum swings. The first column in Table I gives the place where the pendulum was set swinging, the second the latitude,