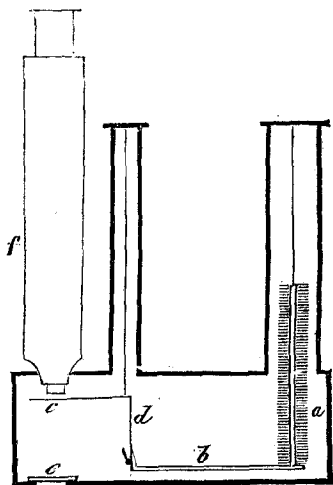


*Magnetic Declination.* By Dr. JOULE.

From the London Mechanics' Magazine, May, 1865.

At the ordinary meeting of the Literary and Philosophical Society, March 21, 1865, R. Angus Smith, Ph. D., F. R. S., President, in the chair, Dr. Joule described an instrument he had constructed, for showing rapidly minute changes of magnetic declination. The adjoining cut represents a section of the instrument. *a* is a column of small magnetic needles suspended by a filament of silk. Attached to its lower end is a glass lever *b*, with a hook at its end. A fine glass lever *c* is suspended by a single filament of silk, its shorter arm being connected with the first lever by means of a small hook attached to the fibre *d*. The whole is enclosed in a stout copper box, into which light is admitted through a lens *e*, cemented into an orifice immediately under the object-glass of the microscope *f*. The microscope magnifies about 300 linear, and has a micrometer in its eye-piece, with divisions corresponding to  $\frac{1}{2000}$ ths of an inch. One division corresponds to a deflection of the needle of  $4\frac{1}{2}''$ ; and as a tenth of a division can be very readily observed, the instrument measures deflections to within half a second. So rapid is the action that, on applying a small magnetic force, the index takes up its new position steadily in two seconds of time. Besides being a damper to the motion of the needle, the copper box, by its conducting power, equalizes the temperature rapidly, so that the indications are not to any considerable extent disturbed by currents of air. The success of the present instrument encourages the hope that very much greater delicacy may be obtained by a further multiplication of the motion and the use of a more powerful microscope. Dr. Joule stated that he had observed an extensive magnetic disturbance the previous evening, the index being driven entirely out of the field of view.

The President said that three meteorological instruments of true originality and of unprecedented delicacy had been described to that Society by the inventor, Dr. Joule. For common observation, the instruments were too refined, but in some fields of inquiry they seemed the only hopeful guides. Manchester had not yet a Meteorological Observatory, although the proposal had often been made to establish one. Private spirit, as in the instance of Mr. Vernon and others, had made the necessity less felt than before. But there was now an opportunity of beginning one with entirely new apparatus of Manchester origin, which would probably very much alter the quality of the inquiries made in meteorological establishments.



Mr. Baxendell stated that the Society had in its possession a thermometer constructed by the late Dr. Dalton, and which, it is believed, was used by him in many of his meteorological observations. The scale has the initials "J. D." and the year "1823" engraved upon it; and the freezing and boiling points of water are indicated on the stem by fine file marks. As it is known that the zero points of thermometers sometimes change to the extent of one or even two degrees in the course of several years, it occurred to Mr. Baxendell that it would be interesting to ascertain whether any change had taken place in this thermometer, and he had, therefore, lately tested very carefully the position of the freezing point, but found that no sensible alteration had taken place; and he believed, therefore, that great confidence might be placed in the observations which Dalton had made with this instrument.

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*Aboriginal Ingenuity.—The Tepiti.*

Indications that American Indians were an original, and, to a certain extent, an isolated race, are to be found in mechanical devices which they had, as in others which they had not; absence in one case and their presence in the other being hardly reconcilable with foreign communication or intercourse. Tribes that became the most advanced carried out the thread-making idea without the *distaff* and *pendant spindle*; they had not the *bellows* nor *scissors*, nor is it certain that either the *domestic lamp* or *candle* was known. The Maya MS. dictionary is said to mention a "hanging star," supposed to refer to a suspended light, perhaps in the temple. Then, there is no indication of the potter's wheel in their crockery ware. Now, could any people from Europe or Asia have made anything like an early settlement on the continent, and not have introduced one or more of these? and if introduced could they have vanished without leaving a trace of one of them north or south, east or west? We learn from Garcilasso la Vega how delighted his countrymen, the Peruvians, were with scissors. A young Inca told one of his school-fellows that the Spanish deserved all the gold and silver in the country for introducing them and looking-glasses. The native mode of cutting the hair with flint and obsidian knives was tedious and painful.

But there are devices peculiar to American Indians which speak to the same effect. Early colonists on the Atlantic or Pacific coast, or inland, would be alive, as new colonists ever are, to native devices, and ready to adopt such as had advantages over their own, and such they would naturally send or take to their own people. Now, among others, there is one that could not have escaped the observation of even transient visitors or settlers, and one so novel, simple, and efficient that, if the knowledge of it ever reached Europe or Asia, it would certainly have been preserved to this day. I refer to the *Tepiti*, or Cassava press, as interesting an example of primeval ingenuity as sacred or profane writers have ascribed to oriental inventors.