as in a Latin version. By means of these photographic copies of the map, the legends in Spanish are made accessible. I am not aware that they have ever been published as a whole. There is something more than a suspicion that some of the legends in Latin contain statements not to be found in the Spanish. A committee of the Massachusetts historical society, to whom a copy of this map, presented by the president, has been referred, intend to publish an English translation of the legends, with the result of a comparison with the Latin version.

CHARLES DEANE.

MAP OF THE PLANETS AND STARS NEAR THE SUN, MAY 6, 1883.

THE map which is given in this number of SCIENCE has been prepared to aid astronomers, who may observe the total solar eclipse of this year, in a search for Vulcan. It does not need to be said that the eclipse of May 6 is the most favorable for this purpose that will occur for many years, and it is to be hoped that the unique opportunity will not be lost.

The present map has been compiled with care from the *Durchmusterung* catalogue, checked by comparison with the maps and by proof-reading. It contains all the stars of the *Durchmusterung* within the region near the sun, down to the seventh magnitude inclusive, together with a few stars of a slightly lower magnitude, which are only added when their omission would spoil a configuration. The planets Saturn and Neptune are also added. The positions of the map are amply accurate for the purpose intended.

EDWARD S. HOLDEN.

Washburn observatory, university of Wisconsin, Madison, Jan. 11, 1883.

FIRST USE OF WIRE IN DEEP-SEA SOUNDING.

IN view of the great impetus recently given to deep-sea sounding and dredging (especially in the United-States navy and coast survey work) by the application of steel piano-wire in place of line, it is interesting to learn the fate of the first experiments in that direction. These have been extracted by Commander J. R. Bartlett, U.S.N., of the hydrographic office, from the log-book of the United-States schooner Taney, Lieut. J. Walsh, U.S.N., commanding, October, 1849, to June, 1850.

The Taney took on board at the Brooklyn navy-yard, Oct. 22, 1849, a large iron reel containing 7,000 fathoms iron wire graduated Nos. 7 to 13; an extra reel with 5,900 fathoms wire, size not stated; and a small reel with 300 fathoms iron wire, size No. 5.

The Taney sailed Oct. 26, 1849, to take deep-sea soundings in the North Atlantic. On the 15th of November preparations were made for sounding with wire in lat. 31° 59′ N., long. 58° 43′.5 W., not far from Bermuda. After reeling out 5,700 fathoms, the wire parted near the surface, owing to the fact that the splices had some projecting ends which caught upon each other. The No. 7 wire parted. It is noted in the log, that the circumstances were favorable and the sounding plumb. It seems, however, that the lead used was altogether too small, about twelve pounds only; and this was the reason why so much wire ran out without its being recognized that bottom had been reached. The weight of the wire of course carried it out, and would have continued to do so as long as any wire was left. The lead was armed with a Stellwagen cup, but the detaching apparatus and dynamometer for sounding were then unknown.

The same experience was repeated on the 9th of May, 1850, when 2,200 fathoms of wire were lost; and on the 18th, when 2,050 fathoms were lost, with the thermometer, twelve-pound lead, and Stellwagen cup. On the 22d of May the last attempt was made with the same results; the wire parting in every instance owing to one splice catching upon another on or near the reel. The last time only an eight-pound lead was used, with 1,900 fathoms of wire out when it parted. The party returned to New York, June 3, 1850, shortly after which Lieut. Walsh died. This ended the trial of wire for the time; to be revived when the invention of steam reeling-apparatus, detaching sounding-cups, the dynamometer, and 'accumulators' had rendered its use practicable. It seems singular, however, that the difficulty as to the splices was not remedied on the spot, and that heavy leads were not tried.

WILLIAM H. DALL.

AN EXTENSION OF THE THEOREM OF THE VIRIAL AND ITS APPLICATION TO THE KINETIC THEORY OF THE CONSTITUTION OF GASES.[1]

CLAUSIUS has designated as the theorem of the virial the equation which he first arrived at in a paper upon a *New mechanical theorem applicable to heat.*[2] This theorem applies to stationary progressive motion, such as the molecules of gases are assumed to have in the kinetic theory of gases, and, when so applied, may be written in the form

$$akt = \tfrac{2}{3} pv + \tfrac{1}{3} \Sigma rR \quad . \quad . \quad . \quad . \quad (1)$$

[1] Abstract of a paper read by H. T. EDDY, Ph.D., University of Cincinnati, before the Ohio mechanics' institute, Jan. 18, 1883.

[2] Phil. mag. [4], vol. 40, p. 122.