problem, concerning which much yet remains to be elucidated, the question arises, whether position-value—the ingenious

ing, the vacuum is graphically filled by the symbol of a vacuum (*sûnya, sifron, tzŭphra*). In the "*Method of Eutocius,*" I find in the group of the myriads the first trace of the exponential or indicational system of the Greeks, which was so influential in the East: M^{α}, M^{β}, M^{γ}, designate 10,000, 20,000, 30,000. That which is here alone applied to the myriads, passes among the Chinese and the Japanese, who derived their knowledge from the Chinese two hundred years before the Christian era, through all the multiples of the groups. In the Gobar, the Arabian "dust-writing" (discovered by my deceased friend and teacher Silvestre de Sacy, in a manuscript in the library of the old Abbey of St. Germain des Près), the group-signs are points—therefore zeros or ciphers; for in India, Thibet, and Persia, zeros and points are identical. In the Gobar, $3\cdot$ is written for 30; $4\cdot\cdot$ for 400; and $6\,\overset{\cdot}{\cdot\cdot}$ for 6000. The Indian numbers, and the knowledge of the value of position, must be more modern than the separation of the Indians and the Arians; for the Zend nation only used the far less convenient Pehlwi numbers. The conjecture of the successive improvements that have been made in the Indian notation appears to me to be supported by the Tamul system, which expresses units by nine characters, and all other values by group-signs for 10, 100, and 1000, with multipliers added to the left. The singular ἀριθμοὶ Ἰνδικοί, in a scholium of the monk Neophytos, discovered by Prof. Brandis in the library of Paris, and kindly communicated to me for publication, appear to corroborate the opinion of such a gradual process of improvement. The nine characters of Neophytos are, with the exception of the 4, quite similar to the present Persian; but the value of these nine units is raised to 10, 100, 1000 fold by writing one, two, or three ciphers or zero-signs above them; as $\overset{\circ}{2}$ for 20, $\overset{\circ}{2}\,4$ for 24, $\overset{\circ\circ}{5}$ for 500, and $\overset{\circ\circ}{3}\,6$ for 306. If we suppose points to be used instead of zeros, we have the Arabic dust-writing, Gobar. As my brother, Wilhelm von Humboldt, has often remarked of the Sanscrit, that it is very inappropriately designated by the terms "Indian" and "ancient Indian" language, since there are in the Indian peninsula several very ancient languages not at all derived *from* the Sanscrit, so the expression Indian or ancient Indian arithmetical characters is also very vague, and this vagueness applies both to the form of the characters and to the spirit of the methods, which sometimes consist in mere juxtaposition, sometimes in the employment of coefficients and indicators, and sometimes in the actual value of position. Even the existence of the cipher or zero is, as the scholium of Neophytos shows, not a necessary condition of the simple position-value in Indian numerical characters. The Indians who speak the Tamul language have arithmetical symbols which differ from their alphabetical characters, and of which the 2 and the 8 have a faint resemblance to the 2 and the 5 of the Devanagari figures (Rob. Anderson, *Rudiments of Tamul Grammar*, 1821, p. 135); and yet an accurate comparison proves that the Tamul arithmetical characters are derived from the Tamul alphabetical writing. According to Carey, the Cingalese are still more different from the Devanagari characters. In the Cingalese and in the Tamul, there is no position-value or zero-sign, but symbols for the groups of tens, hundreds, and thousands. The Cingalese work, like the Romans, by juxtaposition, the Tamuls by coefficients. Ptolemy uses the present zero-