Altogether these reports afford pleasing proof that the energy of our race is exerting itself to advance medical science in a relaxing tropical climate.

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*On the Origin of Arithmetic* (*Über den Ursprung des Zahlbegriffs aus dem Tonsinn und über das Wesen der Primzahlen*). Von W. Preyer in Berlin. Hamburg and Leipzig. 1891.

Professor Preyer, of Berlin, lays down as the foundation of his inquiry that all mental conceptions come through the senses. Arithmetic is the science of pure time, as geometry is the science of pure space. Preyer regards the ear as the organ of the sense of time, and the eye as the organ of the perception of space. How can a man who has no conception of time arrive at the conception of numbers? Children, he says, count and make estimates without a knowledge of numbers. It is sometimes assumed that all numbers are evolved through the addition of units, but this hypothesis assumes that they already know two numbers, and the knowledge of a method, that is of addition. These must first be acquired. Preyer thinks that the perception of numbers comes in the first place through hearing and the comparison of tones, and then becomes supported by seeing and touch. The sensation of intervals in musical consonance seizes upon the attention of children and uncivilized people. The lower numbers are learned through the feeling of pleasure at noting the intervals in musical tones —the first 1-1, the octave 2-1, the fifth $1\frac{1}{2}$, the major third $1\frac{1}{4}$, and the natural seventh $1\frac{3}{4}$, which goes between the fifth and the octave. The major third itself is not so primitive a sound as the fifth, because it lies between it and the first. The first indicates the repetition of a single tone with no rising in height. All the tones used in singing and in music are compounded of the octave, the fifth, the major third, and seventh. The other consonances are not needed to bring out the most pleasing harmonic tones, but they go to add more force to them. Preyer then holds that the lower numbers are at first names which indicate the recognition of the intervals of the tones which are most universally pleasing.

The learned Professor pursues his analysis through a pamphlet of thirty-six pages. I cannot subscribe to his assumption that arithmetic is the science of pure time. When a person recognizes four or five small objects at once there is a simul-

taneous recognition of so many points in space without any succession in time. The sense of hearing, however, brings us into closer relations with time than with space. Helmholtz has shown that in sound the number of the vibrations in the air and in the nerve fibres of the ear are identical. These vibrations in musical tones have a numerical relation to one another. No one will deny that numbers may be learned through the ear, that is, through the perception of the repetition of sounds, or in the intervals in the musical scale. But the power of abstracting numbers from these is an inherent quality of the human intellect, and this capacity can be exerted by those who never heard a sound, by the blind, and even by those who are both blind and deaf, that is numbers might be learned through touch. Some people rest their conceptions of numbers upon visual objects; others upon sounds. Inaudi, the arithmetical prodigy lately exhibited in Paris, made his calculations through heard numbers working in his mind. Other great calculators work their problems through visualized ciphers, aiding their mental operations by counting on their fingers. The arithmetical faculty is not dependent upon any one sense, although it could not be evolved in the absence of sensation.

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*A Dictionary of Psychological Medicine, giving the Definition, Etymology, and Synonyms of the Terms used in Medical Psychology, with the Symptoms, Treatment, and Pathology of Insanity, and the Law of Lunacy in Great Britain and Ireland.* By D. Hack Tuke, M.D. Two vols. J. & A. Churchill, London. 1892.

The production of the "Dictionary of Psychological Medicine" is an event which ought not to be passed by without mention in the "Journal of Mental Science." For in two large volumes of 1,400 pages of this work nearly one hundred and thirty writers, besides the Editor, have contributed from their special sources of information the latest views and researches on all that concerns psychological and neurological medicine and jurisprudence. The indefatigable editor has gathered together a band of workers, not only from our own and other English speaking countries, but from the continent, and from almost every nationality