The Statesman's Year-Book: Statistical and Historical Annual of the States of the World for the Year 1914. Edited by Dr. J. Scott Keltie, assisted by Dr. M. Epstein. Fifty-first annual publication. Revised after Official Returns. Pp. lxxix + 1500. (London: Macmillan and Co., 1914.) Price 10*s.* 6*d.* net.

As the years go by, the growth in size and usefulness of this welcome summary of the world are signs not only of the value of the contents, but of the carefulness which marks its compilation. Much wants more, and many readers would, no doubt, appreciate the extension of the introductory tables to include world surveys of other commodities than coal, gold, etc. The maps this year deal with new political boundaries in Balkania and Mongolia, the extension of railway communications in America, and the position and number of the wireless stations of the world. Many portions of the main text have been subjected to a thorough revision by competent authorities, and no effort seems to have been spared to bring the fifty-first issue thoroughly up-to-date. The complete bibliographies add specially to the usefulness of this indispensable year-book.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Man's Chin: a Dynamical Basis for Physical and Psycho-physiological Utilities.

To account for the presence of man's chin at least three different explanations have been brought forward and discussed:—(1) That the chin has been evolved by sex selection for its æsthetic value; (2) that it was needful for the development of the genio-glossal muscle and speech; (3) that with man's erect posture the chin has been chiefly useful in affording room for important structures in the throat, and in protecting them during combat, etc. These explanations have so far met with very little acceptance.

A conception of the chin as a *dynamical* factor in both mastication and speech does not appear to have received attention. An engineer examining the dental mechanism as a type of machine new to him would, on finding there was a considerable bulk of constructional material projecting from the chief moving member, be nearly certain to ask—What does this do? The chin mass is situated at the outer end of the jaw lever, where its momentum is greatest. It is built up in the heavier material used in the general construction. There is another point, too, that one should not too readily dismiss as a mere coincidence. Every rotation movement of the mandible during its elevation or shutting has combined with it a movement—obliquely upward and backward—of translation. The combined movements are so directed that at some parts of the jaw the resultant velocity is less than would exist if either component were to act alone; and at about a point situated between the jaw angle and the condyle, the resultant velocity is so small that some observers mistakenly believed it to be nil. At the chin, on the other hand, the directions of the component movements are such that the resultant velocity reaches nearly its maximum acceleration.

My suggestion is not quite that the chin is simply man's masticating hammer; something rather less crude than a purely percussive function is conditioned by the momentum of the chin. No doubt the momentum of the chin may appear to be a very small contribution to the considerable muscular force often used in chewing. Yet on the teeth themselves many morphological details that have been preserved as distinct specific features are so small that we do not yet know what the particular utilities are that determined their shape and survival. Further, there is another peculiarity in the mandible movement that may have some significance in this connection. During a (supposable) uniform movement of rotation about the condyle as horizontal axis, the accompanying translation movement is not uniform, but relatively varied—slow or small in the beginning, quicker in the middle, and slower again towards the end of the condyle path. This is favourable to the normal *rhythmical* movement of the jaw by giving in some degree a pendulum-like character to its swing. And it so happens that the position of maximum velocity (and momentum) coincides with the position of greatest resistance and food-strain in chewing—that is, when the cutting-edges of the external blades of the lower cheek teeth are just about to pass their upper opponents in the inward-and-upward shearing thrust. The chin momentum operates most strongly just about the point where it is most useful in preserving the rhythmical movement of mastication, so as to render less necessary any *consciously*-directed variation in the muscular effort put forth in any single chewing stroke.

Then, in the numerous smaller chewing movements for the finer reduction of food morsels, the chin mass (by both inertia and momentum) has at least some value as a "balance," controlling and guiding the niceties of direction in the thrust. The utility of balance influences the construction of many man-made implements (pen- or brush-holder, razor handle, spear, etc.) in the use of which some precision is required; this feature in construction has usually been adapted and has survived quite independently of any conscious or theoretical estimation of its special function. The obvious objection that animals manage the "niceties" of mastication without a chin could be met only by going more fully into the dynamics of the subject. This much at least can be stated here as being susceptible of proof—that as compared with the prognathous savage or the ape, the dental apparatus of modern civilised man is the "finer" machine, in so far as it is the better adapted for those shearing stresses by which tough foodstuffs are comminuted with economy of effort.

The above suggestion of "balancing" and "steadying" utilities can also be applied to the rapid and yet delicately controlled movements of the mandible in speech. The man who wrote a book on "The Speech of Monkeys" might possibly have had hope of more success in interpretating the "language" of these animals if only he could have subdued and steadied their jibberings and chatterings by providing them with good weighty chins.

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Meteoric Streaks and Trains.

PROF. C. C. TROWBRIDGE, of New York, has been conducting an interesting investigation, during recent years, into the heights and velocities of the streaks and trains of meteors. He has been collecting old records of these phenomena, and will be glad to receive any new materials which may be gathered during this year's Perseid shower. Every year brings us some brilliant Perseids leaving durable streaks, and it is important that when these appear the drift