Newcomb's preface without seeing the gross and unpardonable carelessness of a reviewer who would interpret it as Professor James did, not to speak of the additional carelessness in writing which led him to so misquote Newcomb's words as to make them explicitly convey the meaning he had falsely assigned to them.

Somewhat more pardonable — if due to ignorance on Professor James's part — is his speaking of Professor Newcomb as 'wandering over into the economic field' at an advanced period in his life. Most people in this country who are interested in economics know that Professor Newcomb has been a student and writer upon economics for the last twenty-five years or more. If Professor James knew this, — however low might be his opinion of the result of Professor Newcomb's studies, — his speaking of Newcomb's 'wandering over into the economic field' is simply inexcusable misrepresentation.

Professor James goes on to say that "there is no evidence in the style of reasoning in this work that the author is at all acquainted with the recent literature of the science either in England or on the continent. One great advance in economic science in the last twenty five years lies in a change of its prevailing method." I, for my part, do not know to what extent Professor Newcomb may be acquainted with the writings of the recent German economists or their English-speaking followers; but, so far as the absence of any effect of their work upon his method of discussion is relied upon as evidence on this head, it is very pertinent to ask Professor James how much of the influence of these writers is discernible in Professor Sidgwick's recent work on political economy. Professor Sidgwick, being unfortunately 'professor in moral and political philosophy,' may be regarded by Professor James as not quite enough a specialist to be cited; but we have his own word for it (in his preface) that, "among foreign writers," he had "derived most assistance from the works of Professors A. Held and Wagner;" and in spite of his having seen the new light, his book professes to be in the main a guarded restatement of the principles of the old masters.

This is not the place to enter into a general discussion of the merits of the new economists who think they have 'exploded' every principle of political economy from which they can show that an erroneous practical conclusion has been drawn, and who freely distribute such adjectives as 'crude,' 'dogmatic,' and 'mazy,' in speaking of any theory which they find has not taken note of every disturbing influence. But it is presumptuous in a member of this school to regard a general adherence to the methods of Mill and Cairnes as evidence of ignorance or incompetence.

It would take too long to show how unfair is Professor James's presentation of Newcomb's treatment of *laissez-faire*. I trust that the correction I made at the beginning of this letter may be enough to render the reader somewhat suspicious of Professor James's fairness and accuracy in representing his author. It may, however, be worth while to re-enforce this suspicion by observing that the last sentence in Professor James's article is entirely and absurdly gratuitous, as Professor Newcomb, in speaking (p. 153) of the government's assuming (an unfortunately chosen expression, I admit) that "the values of equal weights of the two metals have a certain fixed ratio to each other," is simply engaged in *describing* what governments do when they establish an unlimited bimetallic system; his discussion of the 'views' both of monometallists and of bimetallists being reserved for a subsequent portion of the book (which Professor James would seem not to have read) in which he criticises the arguments on both sides without deciding in favor of either.

FABIAN FRANKLIN.

Baltimore, Nov. 27.

The Biela meteors.

The Bielid meteors were observed here in considerable numbers last evening. I am sorry to say, that, having been very busily occupied all day, I had quite forgotten that they were expected, and so was not on the lookout for them at the beginning of the darkness. I suppose that in consequence I probably missed the maximum of the shower, which seems to have occurred very early in the evening.

On going out of my house at 7.15, my attention was immediately attracted by seeing two meteors in the sky together, followed almost instantly by others. While walking the first hundred yards, I saw twelve; and during the whole ten minutes' walk to the Halsted observatory, I counted thirty-six; though the eye was much disturbed by the street-lights, and though for a considerable part of the way the view of the sky was more or less obstructed by trees and buildings. The shower was apparently on the wane, however, and the number per minute diminished pretty regularly. Up to 7.45, about one hundred had been recorded in all; between that time and 8 o'clock, only three or four more were seen, and observation was discontinued.

About half a dozen of the hundred were as bright as stars of the first magnitude; about fifty were of the second and third magnitudes; and of the remainder a considerable proportion were between the fifth and sixth magnitudes, just fairly visible to the naked eye, and only seen when one happened to be looking at the exact place where they appeared. Of course, it is likely that the real number of these faint meteors was much larger in proportion to the brighter ones than the actual observations would indicate. Several of the larger ones left trains which lasted for two or three seconds, never more, and were always red. In no case was the meteor, or its train, of the greenish or bluish tinge which characterizes the Leonids. The tracks were very few of them more than 10° or 15° long, and the motion was rather slow for a shooting star, the duration of flight being usually more than a second, even when the path was not more than 5° long. In a few cases the tracks were decidedly curved or crooked.

The 'radiant' was very well marked, — an oval region about 4° long, north and south, and about 2° wide. Its centre, according to the best estimate I could form, was about 2° north-west from Gamma Andromedae, A.R. $1^h\ 50^m$, δ 43°.5. The determination rests largely upon three nearly stationary meteors, with tracks not exceeding 15° in length, which appeared within the limits of the radiant; but it agrees satisfactorily with the result obtained by plotting fifteen or twenty other tracks in the same part of the sky.

It would seem from this that the radiant is now a little farther east than it was in 1872, when, according to A. S. Herschel (*Monthly notices*, vol. xxxiii. p. 78), its position was A.R. $1^h\ 41^m.6$ (25°.4) and δ 43°.7. In 1872 some of the best observers found evidences of two or more distinct radiants. Nothing of the

kind is indicated by any observations last night, though a few of the meteor tracks (perhaps five or six in all) would not pass strictly through the radiant if traced back. C. A. YOUNG.

Princeton, N.J., Nov. 28.

A bright meteor.

On Friday, Nov. 13, about 10.30 A.M., the attention of a number of our students was attracted by a brilliant meteor.

The appearance as described by Mr. H. Toulmin, of the senior class, is as follows: The path of the meteor began 15° or 20° west and north of the zenith, following a north-westerly direction, and ending some 20° from the horizon.

The brightness he compares to that of Venus when seen at night. The sun was shining brightly, and no clouds were noticed. No explosion was heard, nor did any fragments seem to reach the ground.

C. L. DOOLITTLE.

Lehigh university.

Absorption of mercurial vapor by soils.

Last year considerable attention was excited by the proposition to utilize the insecticide properties of mercurial vapor against the phylloxera or vine-louse. This suggestion originated with Mr. J. A. Bauer, a druggist of San Francisco, and himself the owner of a vineyard in the infested region of the Napa valley, where he had for some years experimented on the efficacy of mercury, and satisfied himself of its usefulness as a preventive of infection, when, in planting, each cutting was surrounded by a few inches of earth mixed with 'deadened' mercury. Upon publication of the fact, a considerable demand for the mercurial mixture (consisting of equal parts of finely divided mercury and clay or chalk) was made by persons interested, and many thousand vines were treated in different localities in the manner prescribed by Mr. Bauer. This was to mix thoroughly about a peck of earth with an ounce of the above mixture, and fill in with it the hole in which the cutting has been placed, to the depth of at least six inches from the surface. Many experiments were also made on vines already infested, to see if the mercury would gradually spread so as to disinfect the whole of the root system.

Contrary to expectation, most of these experiments proved a failure, inasmuch as the phylloxera seemed to continue, unchecked, on the roots already infested, and in some cases clean cuttings had become infested, despite the surrounding mercurialized soil.

Having witnessed a number of the successful experiments upon which Mr. Bauer's recommendations were based, I undertook an investigation of the circumstances of the reported failures, and soon discovered two that were essential. One was that the mercury used was considerably contaminated with lead, which is known to diminish exceedingly the evaporation of mercury; another, that oil had been used in order to facilitate the 'deadening' process, and thus each globule was covered with a film that additionally impeded volatilization. In fact, the iodine test for mercurial vapor showed that a mere trace of the latter existed around the mixture furnished by Mr. Bauer, while a similar one prepared with pure mercury showed abundant volatilization at the ordinary temperature, and acted very promptly upon insects.

Yet, upon using the latter mixture in the manner prescribed by Mr. Bauer, in a very clayey soil, neither the insects nor the iodine test manifested the presence of mercurial vapor. It was now remembered that Mr. Bauer's successful experiments had been made in a very sandy soil of the city of San Francisco; and the inference was plain, that, just as aqueous vapor would be absorbed to a much greater extent by a clay soil than by sand, so the mercurial vapor was at first absorbed by the former until saturation was reached, which might not be for many weeks or even months; the soil acting as an effectual disinfectant until supersaturated.

Experiments proved this surmise to be correct; and the investigation, still in progress, seems to show that the capacity of soils for the absorption of aqueous vapor may serve as an approximate measure of their relative capacity for the absorption of mercurial vapor also. Thus in pure sand, which in a saturated atmosphere at 15° C. absorbed only .5 per cent of aqueous vapor, the amount of mercurial vapor absorbed was too small for analytical determination; while in a clay soil, absorbing, under the same conditions, 6 per cent of watery vapor, the mercurial vapor retained at 49° C. amounted to .012 per cent, equivalent to about 130 grains per cubic foot of soil. Now, since from one-fourth to one-half cubic foot was used in the treatment of vines, it follows that from 33 to 65 grains of metal out of the 240 used in each case, would have to evaporate and impregnate the soil, before any free vapor would be available for action on the insects. At the low temperature of the soil this would naturally take a considerable length of time: hence the failures.

It is of course perfectly feasible to insure this impregnation beforehand by exposing the mercurialized soil to a higher temperature (e.g., to that of 49° C., easily attained in California by exposure to the sun) for ten or twelve hours, or for a much shorter time to steam-heat. A clay soil so prepared will act on the phylloxera as promptly as when sand is used; all being dead, or incurably poisoned, within from 20 to 30 hours.

The method is therefore far from being a failure, as has been industriously represented by interested parties. It will accomplish all that has ever been claimed for it; to wit, the preservation of young vineyards from infection through the ingress of the phylloxera from above; and, as there is no occasion for disturbing the earth immediately surrounding the stock of a vine, there is no reason why this protection should not continue for all the time the vine is likely to live. With proper precautions, it will also, no doubt, be available against other insect pests of similar habits; e.g., the 'woolly aphis' (Schizoneura lanicera Hausm.). The conditions for successful application in practice in various cases are still under investigation. E. W. HILGARD.

Agric. exper. station, Berkeley, Cal., Nov. 23.

The English sparrow.

Your correspondent in *Science*, No. 147, asks for information in regard to the English sparrows. In this city (Cincinnati) and vicinity there are large numbers of these birds, and local ornithologists have no hesitation in saying they drive away the native songsters.

At my house, in one of the thinly populated suburbs,