flowered form must be favoured in the struggle for existence, when ceasing to develop their useless anthers. Thus of the smallest-flowered form, varieties with atrophied anthers of necessity remained at last the only survivors.

Lippstadt, June 17 H. MÜLLER

ALL the flowers of the ground ivy (*Nepeta Glechoma*) that I have this season examined, from this neighbourhood, have been of the stamenless form described by your correspondent "S. S. D." While spending a few days at Bath, I could find none but hermaphrodite flowers. At Hertford I found both forms, but a preponderance of hermaphrodites. These seem always more or less protandrous, and spontaneous self-pollenation is further prevented by the unequal lengths of the style and stamens.

Kilderry, Co. Donegal W. E. HART

Lotus corniculatus

MR. W. E. HART (NATURE, June 12) is quite right in correcting me on the subject of the fertilisation of *Lotus corniculatus*. It is the outer whorl of stamens, those opposite the calyx teeth, which continue to grow after the others, and which have their filaments dilated at the top so as to thrust the pollen out of the long sharp tube of the keel. I should scarcely have thought it necessary to acknowledge his courteous correction, if it were not for the following question and answer: How is it, then, that the pollen of the inner and shorter whorl of stamens, which discharge their pollen at the same time as the outer whorl, gets pushed out by the filaments of the outer whorl, since the anthers of the inner whorl lie below the summits of the filaments of the outer whorl? The answer is curious: In the early bud, before the anther cells begin to open, the inner whorl is obviously shorter than the outer whorl, so that the anthers of the former lie in a regular row entirely below the anthers of the latter, apparently for the convenience of close packing in the narrow closed flower. As the anther cells begin to open, which is just before the flower opens, the stamens of the inner whorl grow and approach very nearly in height to the stamens of the outer whorl; and as they shed their pollen from the summit of the anthers, their pollen comes out above the dilated tops of the filaments of the outer whorl, so that it can be pushed forwards by those filaments along with the pollen of their own anthers. The filaments of the inner whorl then wither and become comparatively short, while those of the outer whorl continue to grow, dilate, and stiffen, so as to do the work for all the pollen of both whorls. In the mature opened flower the difference between the two whorls becomes more marked than ever. If I am right, Mr. Hart's detection of my blunder leads to the notice of a curious instance of economy of space and of mechanism. T. H. FARRER

Abinger, Surrey, June 21

The Secchi and Respighi Methods

IN the number of NATURE for June 12, p. 136, I see that you notice the results obtained in the last eclipse with the use of the spectroscope for determining the first entrance of the moon or planet. There seems, however, to be some confusion in the report. You say that I propose Respighi's method for first contact, and my own for the last. This is not the case. I propose the common Respighi method as useful for obtaining a *first warning* of the entrance of the planet on the chromosphere. This is the only use I think it possible to make of it. But the real entrance must be obtained by my method, in which one sees the disc of the sun as with a common glass, and the line of the chromosphere tangent to it, can be seen broken at the instant of contact, as the ring of Venus is broken at its exit from the solar disc.

You say also (page 131, col. 1) that it is difficult to obtain a perfect adjustment on account of the inequality of the driving-clock. If you say so for the common spectroscopic method, I agree perfectly with you, because the edge of the disc cannot be seen; but with my method this difficulty does not exist. It is not more difficult to keep the sun's disc tangent to the chromospheric line, than to keep it tangent to a common wire; the clock can help, but it is not necessary to have it in perfect order; even with common handles one can obtain it. The reason is that the solar disc being perfectly visible, one is greatly helped by the edge of the sun itself, while in common methods the edge of the sun is not seen.

Rome, June 16 P. A. SECCHI

P.S.—More on this will be found in the *Memorie del. Soc. degli Spettroscopisti Ital.*

Gassendi and the Doctrine of Natural Selection

NO one having yet replied to the question in Mr. Monro's letter (see NATURE, vol. vii. p. 402), I venture to hope that you will give me space for a few remarks on Gassendi's physical philosophy, and more especially on that part of it germane to the subject discussed by Mr. Monro.

The apparent implication of the question referred to is, that anticipations of natural selection are to be found in Gassendi's writings. Allowing to the term its utmost latitude of meaning, this does not appear to me to be the case. In his historical sketch of the various views which poets and philosophers have held as to the origin of things, Gassendi gives the theory of Empedokles at some length, including the passage on the *βουγενῆ ἀνδρόπρωρα* which Mr. Monro quotes in his letter. But Gassendi has no word of approval for the theory; he classes it with other Greek cosmogonies, such as those of Anaximander, Pythagoras, &c., and with the Chinese and Hindu cosmogonies as "fabulares sententias philosophorum," not less fabulous indeed than the poetic fictions of Prometheus, Deukalion, and Kadmus. Here, too, as well as in other parts of his works, Gassendi blames philosophers for ascribing to the action of natural laws effects which he regards as direct results of the Divine power.

Before giving a brief summary of Gassendi's own views, I will premise that it is not easy to discover them with exactitude. His works are very voluminous, both the Lyons edition of 1658, and the Florence edition of 1728, occupying six bulky and closely printed folio volumes. Even the abridgment made by his disciple Bernier fills seven vols. 12mo. Ordinary histories of philosophy give for the most part a very meagre account of the French forerunner of Locke; and more comprehensive works, like those of Tennemann, Buhle, and De Gerando, deal with Gassendi as a psychologist and a moralist rather than as a physicist. Even Dr. Whewell, from whom, as the historian of the inductive sciences, more might have been expected, makes but a few cursory references to the philosopher who was one of the earliest and most pronounced followers of the Baconian method, and who, as De Gerando says, "enseignant les mêmes principes (as Bacon) les a surtout enseignés par son exemple." The work which, as far as I have seen, gives the most complete account of Gassendi as a physical philosopher is Schaller's "Geschichte der Naturphilosophie von Baco bis auf unsere Zeit." This writer takes Bacon, Hobbes, and Gassendi as the typical philosophers of the empirical or *a posteriori* school of natural philosophy. He devotes about one hundred pages to the exposition of Gassendi's physical doctrines, and concludes with an elaborate criticism of his atomic theory. The intrinsic obstacles to a precise appreciation of Gassendi's views are more serious. Not far removed from the age of scholasticism he exhibits, in a modified degree, two of the distinctive features of the schoolmen, their pedantic erudition, and their commentatorial spirit. The wealth of quotation with which his pages are burdened rather than adorned has laid him open to the charge "de laisser étouffer ses propres idées sous le poids des citations empruntées aux anciens." He better deserves the second than the first clause of Gibbon's epigrammatic eulogy: "Le meilleur philosophe des littérateurs, et le meilleur littérateur des philosophes." A work largely imbued with the commentatorial spirit, as the *Syntagma Philosophicum* is, is always more valuable as a history of philosophic opinion than as a source of new philosophic thought. Again Gassendi's bent of mind, coupled with the exigencies of his position as a Church dignitary, seems to me to have precluded his holding opinions of a very decided and novel character. True or not, the reason he is said to have given for adopting the atomism of Epicurus rather than the Cartesian theory of vortices is somewhat characteristic; "Chimæra for chimæra I cannot help feeling some partiality for that which is two thousand years older than the other."

In his views as to the origin of things, Gassendi is at once an atomist and a special creationist. One experiences a certain sense of incongruity in noticing the way in which, while following the Biblical narrative for the main outlines of his doctrine, he fills in the details from Atomism. In the beginning there was a chaos in which the Deity had intermingled in manifold confusion atoms, molecules, *corpuscula insectilia*, or *minima naturalia* (a phrase borrowed from Lucretius) of every kind, celestial and terrestrial, organic and inorganic, animal and vegetal. Upon these atoms had been impressed peculiar motions and affinities. At the creation of the world, as the creative fiats in their turn went forth, the potential motions and affinities of each species of atom became kinetic, and by the concourse of