Greek masculine noun οἶστρος, oistros (for which the purest Latinists are perhaps wont to employ either *asilus* or *tabanus*), and is therefore itself obviously of the same gender.

The Greek word originally referred to a dipterous insect infesting cattle (probably *tabanus bovinus*) the gad- or bot-fly, and in this sense is as old as Homer. Later, Aristotle employed it of a parasite of tunny-fish, and also of a small insectivorous bird. Meanwhile, by another line of evolution, it came figuratively to signify a sting, hence something that drives one mad; frenzy, insane impulse, mad passion, etc., and is so employed by the writers of the golden period of Greece.

So far as I know, its Latin transliteration is first found in Virgil. But it is still masculine, as in Pliny.

We must now take a leap across the centuries to the learned Isidore of Seville (*c.* 600 A.D.), who, in his "Origines," is apparently the earliest writer to turn this masculine noun into a neuter. Why he did so must remain, in the absence of any evidence, inexplicable. In any case, his great reputation as a scholar apparently set a precedent for later writers. Du Cange, in his monumental "Glossarium Med. et Inf. Lat.," actually spells it oes, but refers to Isidore's *oestrum.*

Coming now to English literature, it is a fact that the neuter form has for some centuries been naturalized in our language. In 1656, for instance, S. Holland, applying the term to a flea, speaks of "defying the eagerness of those sanguine-coated *oestrums.*" In 1706, Phillips defines the "*oestrum,* or *oestrus,*" as "the gad-bee." Or Badham, in 1854, apparently recalling the zoology of Aristotle, refers to "the conduct of the poor thunny under the scourge of the sea *oestrum.*" In 1663, Butler, in the famous "Hudibras," employs the neuter figuratively. "What *oestrum,* what phrenetick mood, makes you thus lavish of your blood?"

Coming still closer to the modern physiological connotation, Jefferson, in 1782 writes as follows: "Love is the peculiar *oestrum* of the poet"; which to the present writer, at least, suggests the lines from "Locksley Hall";

In the Spring a fuller crimson comes upon the robin's breast:
In the Spring the wanton lapwing gets himself another crest;

In the Spring a livelier iris changes on the burnish'd dove;
In the Spring a young man's fancy lightly turns to thoughts of love.

We come now to its definite physiological use. The earliest example that the Philological Society of England gives is dated 1772 (*Ann. Reg.*): "The times, in which animals of different species feel the *oestrum,* [note that it is neuter and not masculine] by which they are stimulated to the propagation of their respective kinds."

It would seem, therefore, (1) that *oestrum,* as used by modern physiologists, is not intended as a masculine accusative but a neuter nominative (with no philological justification, however, but only that of "the Tradition of the Elders"): and (2) that Heape, who wrote in the second half of the nineteenth century, etc., could not have introduced the word (in either its masculine or neuter dress) as applicable to animal tumescence, inasmuch as the last quotation antedates him by practically a century, and also, intrinsically, bears indications of being a record of a connotation already familiar in England.

Since writing the above, I find that Isidore was not the first writer to employ the neuter. At the close of a discussion of *oestrus,* Facciolatus and Forcellinus, in their "Totius Latinitatis Lexicon," have the following note. "Festus facit oestrum neut. gen., nam et Graece οἶστρον." The reference is undoubtedly to Sextus Pompeius Festus, the author of twenty books, "de Verborum Significatione." While his date is uncertain, he lived at a later period than Martial (*c.* A.D. 75) and before Macrobius (*c.* 400). Isidore perhaps made use of his lexicon, and thus standardized the error.

At how early a date there began the trend towards the modern physiological use of the term may be seen from the following citation from IV Macc., a Greek work by a Jewish Alexandrian scholar about A.D. 50. "For he, a young man at the age when physical desire is strong, by his reason quenched the mad impulse (οἶστρον—masc. acc.) of his passions. . . . The temperate mind is able to conquer the dictates of the passions, and to quench the fires of wild desire (οἰστρῶν)."

STUART L. TYSON

PELHAM MANOR, N. Y.

## POSSIBLE SIGNIFICANCE OF THE DECREASED SUSPENSION STABILITY OF THE BLOOD

THE decrease of the suspension stability of the blood, or the increased sedimentation rate of erythrocytes during disease, has provoked an enormous amount of investigation devoted chiefly to employing this phenomenon for diagnosis and prognosis of various illnesses. The fact that red cells settle more rapidly than normally in so great a number of diseases has led many to regard this phenomenon as too

general to be of value in diagnosis or prognosis. It is possible that the significance of the reaction has been largely overlooked in the efforts to apply it to practical purposes. It may, as Fahreus has already suggested, play a rôle as a factor in the defense mechanism of the body against infection. Fever easily lessens the suspension stability of the blood by causing an increase in the viscosity of the plasma. As a result there is a change in the electrical charge, the erythrocytes clump and settle rapidly. It has been demonstrated that both erythrocytes and bacteria carry negative charges. The assumption would then be that a decrease of the suspension stability of the blood would also favor clumping of bacteria circulating in the blood stream. If the hypothesis is correct that clumping of bacteria is the first step in the successful disposal of bacteria which gain entrance into the body it would appear that the ease with which the suspension stability is disturbed is of considerable significance. It would be logical to consider fever, which alters suspension stability, as one factor in protection against infection.

A number of experiments recently performed indicate that bacteria of various kinds (pneumococci, Friedländer's bacilli, typhoid bacilli) tend to aggregate and clump in plasma from blood exhibiting a marked decreased suspension stability but not in plasma obtained from a normal individual. The clumping is not striking but can often be observed microscopically. If a weak solution of gum acacia is added to increase the viscosity further, the reaction is markedly enhanced. For instance, acacia was added to one of two parallel series of tubes containing increasing dilutions of typhoid antiserum. Typhoid bacilli agglutinated in a far higher dilution of antiserum in the row of tubes containing the acacia. When typhoid bacilli are added to a 5 per cent. solution of acacia, motility is instantly retarded or stopped. Theobald Smith[1] has recently noted a similar phenomenon in the agglutinating action of agar on bacteria.

A few experiments *in vivo* were performed. Mice were inoculated intraperitoneally with a heavy suspension of type I pneumococci and divided into 3 groups. One group was injected intraperitoneally with 0.5 cc of a 10 per cent. solution of acacia, one group with .01 cc of type I antipneumococcus serum and the third group with acacia and antiserum. The mice were killed after ½ hour and 1 hour periods. Pneumococci and leucocytes showed much more clumping in the mice injected with acacia. Occasionally in the mice receiving acacia most of the pneumococci had disappeared, only a few clumps were seen attached to the large agglomerations of leucocytes. In the mice receiving the minute amount of immune serum, pneumococci were found in great numbers, often evenly distributed and not clumped. The observed differences in the three groups were most striking within one hour after inoculation.

It appears, from these experiments, that an increase in the viscosity both *in vitro* and *in vivo* enhances the agglutinative property of specific immune serum. Whether the increase of viscosity of blood plasma which accompanies fever likewise favors agglutination is as yet uncertain and is being investigated.

HOBART A. REIMANN

DEPARTMENT OF MEDICINE,
UNIVERSITY OF MINNESOTA

[1] T. Smith, SCIENCE, 74, 21, 1931.

## FOSSILS FROM THE EASTERN FLANK OF THE SIERRA NEVADA, CALIFORNIA

THE Sierra Nevada of California has been described as a huge fault block, tilted toward the southwest.[1] The northern end of this mountain mass departs considerably from so simple a form, and consists of several parallel ranges with intervening troughs,[2] but in the central and southern portions, the ideal condition of a simple, though dissected, fault block, seems to be much more nearly realized. The lofty escarpment, which limits the southern half of the Sierra Nevada on the eastern side, is composed mainly of plutonic intrusions, thought to have invaded an older series of igneous and sedimentary rocks in upper Jurassic time.[3] Occasional roof pendants of the older rocks occur along and west of the escarpment, at least as far south as Owens Lake, and farther north, in the vicinity of Mono Lake, they become quite large and abundant.

It would be desirable, both from a scientific and a practical standpoint to determine the age of the older rocks, and to correlate them with similar formations in adjoining regions. Unfortunately, however, fossils, although they have been reported from the western slope of the range, and from the northern portion, by various writers, are extremely rare along the eastern escarpment. Also, the geologic structures in the roof pendants are very complex, because of the intense folding and faulting that probably accompanied the intrusion of the plutonic rocks. The lithologic similarities are of doubtful value.

[1] Turner, H. W., "The Rocks of the Sierra Nevada." *U. S. Geol. Survey Fourteenth Annual Rept.*, pt. 2, pp. 435–496, 1894.

[2] Lindgren, Waldemar, and Knowlton, F. H., "The age of the auriferous gravels of the Sierra Nevada, with a report on the flora of Independence Hill," *Jour. Geology*, vol. 4, pp. 881–906, 1896.

[3] Turner, H. W., "The Pleistocene geology of the south central Sierra Nevada with especial reference to the origin of Yosemite Valley," *California Acad. Sci. Proc.*, 3d ser., Geology, vol. 1, pp. 261–321, 1900.