We, however, are of the opinion that most students of prehistoric archeology look at the facts of their science in a very different spirit from this. They assert their existence, but wait until a sufficient number has been accumulated before attempting their explanation. Nevertheless, we must do the author the justice of admitting that he has been very severe and critical in his examination of the evidence of these facts, and will only allow its validity in the cases upon which he has founded his three species, rejecting all the many other alleged proofs of the existence of 'the tertiary man.' He largely relies upon the recent discovery by Professor Bellucci of Perugia, in the presence of several witnesses, of a flint flake *in situ* in a deposit alleged to belong to the upper miocene, at a place called the desert of Otta, not far from Lisbon. It would take more space than we have at our command to point out the weakness of this piece of evidence, which has been done elsewhere.[1] We will merely repeat, that "prudent investigators must hesitate to base the proof of a fact pregnant with such startling consequences upon no firmer foundation than a mere 'bulb of percussion.'"

The other disputed point in the new science, upon which the author takes decided ground, is in favor of the so-called 'hiatus' between the paleolithic and the neolithic periods. He believes, not only that a long space of time, during which great changes were effected in the climate and the fauna of Europe, elapsed between the two periods, but that the second is marked by the appearance upon the scene of a new and more advanced race of men, who with better tools and weapons, and aided by a knowledge of the cereals and the use of domesticated animals, gained the mastery over the autochthonous population of the earlier period. The contrary opinion maintains that the later race were developed from the former by a slow and gradual process. For our own part, we agree with the author's conclusion, believing it to be sustained by the preponderance of evidence.

As both a general statement and a minute account of the present state of knowledge in regard to prehistoric subjects, we know of no work superior to this. It is a complete storehouse of information, gathered by a master of the new science, who assisted at its birth, and has dwelt within its very penetralia. His statements in regard to facts can be relied upon most implicitly; it is only to some of his conclusions that we take exception.

[1] International review, September, 1882.

PINNER'S ORGANIC CHEMISTRY.

An introduction to the study of organic chemistry. By ADOLPH PINNER, Ph.D. Translated and revised from the fifth German edition by PETER T. AUSTEN, Ph.D., F.C.S. New York, *John Wiley & Sons*, 1883. 19+403 p. 8°.

CHEMISTS who are already familiar with Professor Pinner's *Repetitorium der (anorganischen und) organischen chemie* need not be informed of the peculiar excellences of that successful text-book, and will welcome Dr. Austen's translation, which makes it available to English-speaking students. This work presents, in a systematic and comprehensive manner, a review of the enormous number of substances derived from carbon, and especially indicates their mutual theoretical relations. Beginning with the compounds of the group C_1, the author describes, first, the simpler bodies, then their hydroxyl-derivatives, sulpho-derivatives, nitrogen-derivatives (amines, amides, urea, cyanides, etc.), phosphorus, arsenic and antimony compounds, and the so-called organometallic bodies; next follow the simpler substances of the group C_2, with their derivatives; and so on. The space given to any one body or topic is necessarily small. American students, with their utilitarian views, would probably prefer more descriptive matter in many cases, as in alcohol, sugar, starch, petroleum, etc. Practical matters are made subordinate to theoretical considerations.

The translation is clear and generally satisfactory, but not always free from traces of the original language. The translator follows the rules issued by the London chemical society as respects spelling, arrangement of constitutional formulae, and terminology. The work is exceedingly well printed, and very free from typographical errors. As a compendium of the present actual state of organic chemistry, for use in classes having a good foundation of inorganic chemistry, this work is well adapted, and deserves general acceptance.

REPORT OF THE CONNECTICUT SHELL-FISH COMMISSION, 1883.

Second report of the shell-fish commissioners of the state of Connecticut to the general assembly, January session, 1883. Middletown, *Pelton & King*, 1883. 44 p., map. 8°.

IN natural accordance with the reputation of its inhabitants for sound common sense applied to business matters, the state of Connecticut enjoys the distinction of being the first to appoint a commission to supervise its interests in the fisheries of economic mollusks. The

second report of that commission has just appeared. The most important work upon which the commissioners have been engaged is that of mapping the grounds within the state limits suitable for the cultivation of oysters, and assigning the same to those engaged in that industry, upon the payment of an almost nominal fee. Natural beds, or those which have been so within ten years, are exempted from assignment. The immediate result of this policy is to give to the oystermen a property in the ground they use, protection against encroachment, and security in the possession of improvements thereon. This, in time, will largely increase the yield of this valuable food-supply, and add to the taxable resources of the state. At a time when the beds of the Chesapeake are perilously near a destruction, which, under the present conditions of folly, ignorance, and greed in those most interested, is inevitable, the action of the state of Connecticut assumes a national importance. The work of surveying the coast with the co-operation of the U. S. coast survey has been actively carried on, and in its most important features has been carried out for that part of the shore west from the Connecticut river. By the commencement of the working-season of 1883, it is believed that 90,000 acres of oyster-grounds will be held by cultivators under state jurisdiction. A new mode of cultivation, or capture of spat for seed on muddy bottoms, has been invented at Groton. Birch-trees of fifteen or twenty feet in height, and three or four inches in diameter at the butt, are thrust about three feet into the mud, with the tops under the surface of the lowest water, and inclined at an angle of some 45° with the current. The floating spat attaches itself to the branches, and grows rapidly; a single bush affording, in a few months, five to fifteen bushels of seed-oysters, none of which would have survived settling on the muddy bottom. An absurd claim was made, that these submerged bushes produced scarlet-fever and diphtheria, and many were destroyed; but the plan has recently received legal recognition, and, with proper effort, can be made to produce millions of bushels of oysters where is now only waste ground.

The oyster-business in all its branches has attained greater perfection in Connecticut waters than in any other part of the country. It is usually very profitable, but subject to unexpected and sometimes ruinous losses. Thousands of bushels of oysters have been destroyed on one patch in a week by starfish. A firm is mentioned which in two years, off Charles Island, has lost oysters valued at one hundred thousand dollars. The starfish seem to move in crowds, which scatter when they reach a bed, and devour all before them. One fisherman, while searching for them, came upon an immense bunch, and gathered in seventy-five bushels of starfish in a short time, thus saving his bed. The coot (Fulica atra), it has been discovered, feeds upon young starfish, and its protection is recommended. The drill (Urosalpinx cinereus Stimps.) and periwinkle (Sycotypus canaliculatus Gill), as well as the drumfish, are reported to do but inconsiderable damage, especially in the deeper waters. The pollution of rivers falling into the Sound, the dumping of mud dredged out of harbors, and oyster-thieving, are referred to, and legislative regulations suggested. The propagation of the oyster has been attempted, but thus far with little prospect of success, on account of the extreme minuteness and delicacy of the embryos. Without radical improvement on present methods, this branch of the subject offers no grounds for belief in its practical application to economic purposes. The report contains a map of the triangulation executed, and an appendix of statutes bearing on the general topic.

WEEKLY SUMMARY OF THE PROGRESS OF SCIENCE.

ASTRONOMY.

Comet (Brooks-Swift). — The spectrum of this comet was examined at Lord Crawford's observatory, Dun Echt, Scotland, on the evening of March 1, and found to be fairly bright, and to consist of the usual three bands. — (*Dun Echt circular*, No. 71.) D. P. T. [473

The mass of Jupiter. — In a paper published in the Proceedings of the Royal Swedish academy (1882), Dr. Backlund develops the formulae by which the correction to the mass of Jupiter may be derived from heliometric observations of the distances and position-angles of the satellites *inter se*, and not, as usual, from the planet. He is engaged upon a new determination of this character. The chief advantage in this method is, that measures of the star-like satellites from each other are much less likely to be affected by constant errors than are measures of the satellites from the planet. The number of unknown quantities in his final equations is twelve; six observations, at least, being required in order to obtain all the corrections to the elements. — (*Copernicus*, Feb.) D. P. T. [474