flector, and, by forming a counter-current, prevents another ridge forming near it, but favors the formation of a *parallel* ridge at a little distance. The second ridge thus formed acts in the same way as the first, and so on. After the first ridge is once formed, snow would accumulate on the side of it away from the wind, just as in the case of the tree.

JACOB REIGHARD.

La Porte, Ind., Feb. 27.

PREHISTORIC MAN.

Le Préhistorique: Antiquité de l'homme. Par GABRIEL DE MORTILLET, professeur d'anthropologie préhistorique à l'École d'anthropologie de Paris. (Bibliothèque des sciences contemp.) Paris, *C. Reinwald*, 1883. 642 p. 8°.

IN this latest and most important work of the distinguished *conservateur* in the prehistoric department of the *Musée des antiquités nationales de Saint-Germain*, we find exemplified in the highest degree both the merits and the faults of his previous writings. His merits consist in simplicity and elegance of style, and a marvellous capacity for the classification and arrangement of the innumerable details of an infant science, with whose minutiae he displays the most intimate acquaintance. This profound knowledge is combined with a very cautious and conservative spirit in accepting assumed facts, and is accompanied by an inexhaustible patience in their investigation. But as a counterweight to these high qualifications in a teacher of science, he displays a hastiness in his generalizations which will not wait for the slow and steady growth of knowledge, and a dogmatism which insists on forcing upon the world his crude speculations as the accepted truths of science. But what is even more unfortunate (although we can readily account for the existence of such a feeling in a man of science in France at the present time), his resistance to the reactionary spirit of clericalism seems to have resulted in a state of active and bitter hostility to all religion whatsoever. His attitude towards the bigoted and ignorant opposition of religious men to the overwhelming evidence of the antiquity of man can hardly be considered as '*dowered with the hate of hate, the scorn of scorn.*' He more than repays them in their own coin; as when he tells us that "the quaternary man *lived in peace*, entirely unprovided with religious ideas," or speaks of Cuvier as "the illustrious professor of the museum, creator of a new science, but doubled with a mediocre counsellor of state, posing as the defender of what then, as now, was called *the moral order.*" So we cannot help feeling that there must be a little personal pique to account for his sneer at 'certain great academies' which have not yet granted their letters of naturalization to 'palethnological studies;' and we can scarcely believe him to be serious in his complaint that these new doctrines have not yet found their way into the elementary text-books.

Upon the disputed points in prehistoric archeology he utters no uncertain sound. The first part of the work, embracing fifteen entire chapters, is devoted to 'The tertiary man,' although such a title seems to be somewhat inconsistent with his conclusion, that, "during the tertiary times, there existed a being intelligent enough to produce fire, and to fabricate instruments of stone; but this being was not yet a man." He was '*the precursor of man*,' — an ancestral form intermediate between him and the anthropoid apes of the present day. For this remote ancestor of ours, whose organic remains, he admits, have not as yet been met with, he has provided the long and learned appellation of the Anthropopithecus; and this achievement he modestly compares to Leverrier's discovery of a planet, or to the recovery by the philologists of the Aryans from the *débris* of their language. He even goes so far as to assure us that there were at least three species of this long-named creature, the first of which he calls A. Bourgeoisii, named from the late Abbé Bourgeois of Thenay, near Tours in central France, who has been most indefatigable in his search for traces of man in tertiary times. Then comes A. Ramesii, so called from M. Rames, who made a similar discovery near Aurillac in Auvergne. Finally there is A. Ribeiroii, whose appellative is derived from Col. Ribeiro, director of the geological bureau of Portugal, who believes that he has found traces of the existence of man, at that remote epoch, in the valley of the Tagus.

It is hardly necessary to state, that such very advanced Darwinianism as this does not represent the opinion and belief of the great body of students of prehistoric archeology the world over. The writer does not know of six men of science in Europe who accept 'the precursor of man.' The evidence that has sufficed to produce in the author's mind the conviction of his existence must be admitted to be very slight, although this does not appear to disturb him greatly. To the objection that the discovery in a certain locality, of objects that seem to bear traces of human workmanship, has not been confirmed in other places, he replies, that this is "an objection without foundation, since a fact can only be observed at one spot. It is like denying an eclipse because it is only visible upon a small portion of the globe."

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