clods of clay, burnt red and pretty hard. The process of burning is supposed to have been similar to that discovered by Schliemann at Troy. The soil, a sort of loam, had been thrown up into a rampart, the whole coated with clay matted together with bushes and sedge. Over all were heaped prairie-grass and trees, and the pile set on fire. Dr. Yarrow describes a like process pursued in North Carolina grave-mounds. — (*Wisc. hist. coll.*, ix. 99.) J. W. P. [352

EARLY INSTITUTIONS.

History of agricultural prices in England. — M. Jusserand reviews Mr. Thorold Rogers's work upon this subject. He pronounces it one of the great books of our century, and indispensable to the student of economic history. It is full of facts hitherto unknown, or, if known, unclassified, and inaccessible to most students. Mr. Rogers's opinion that the fifteenth century, and the beginning of the sixteenth, was a golden age for the laboring-people of England, is cited as especially notable, inasmuch as a contrary opinion has generally obtained up to this time. — (*Rev. critique*, 18 juin, 1883.) D. W. R. [353

Indirect taxation among the Romans. — M. Dareste sums up all, or nearly all, that is known upon this subject. Very little is known; and very little is likely to be known, unless some more inscriptions, like that discovered not long ago in the ruins of Palmyra, should be found. It was an important find, — a custom-house tariff with regulations regarding the collection of duties. (See *Bull. corresp. hellén.*, mai–juin, 1882.) The inscription has not yet been published. The principal indirect taxes of the Romans were, the custom-house duty (portorium), a tax on successions, upon the manumission of slaves, and the sale of movable goods. They were not very heavy taxes at any time. M. Dareste gives us a very good account of the portorium. The Roman custom-houses were scattered about here and there, wherever merchants were wont to pass or to congregate. A list of localities where there were custom-houses is given. The portorium was a percentage levied upon the value of merchandise. Only merchandise was subject to it. Personal effects of travellers, *instrumenta itineris*, etc., were free of duty. A list of writings upon the subject is given. The principal work cited is that of M. R. Cagnat: *Étude historique sur les impôts indirects chez les Romains.* It was written before the discovery of the Palmyra inscription. — (*Séances trav. acad. inscr.*, Feb.–March, 1883.) D. W. R. [354

INTELLIGENCE FROM AMERICAN SCIENTIFIC STATIONS.

GOVERNMENT ORGANIZATIONS.

Geological survey.

Field-work of the division of the Great Basin. — In consequence of the extension of the work of the survey to the Atlantic states, the director has found it necessary to divert some of its force from investigations already initiated. One of the most important researches thus stopped is that of the quaternary lakes of the Great Basin. The corps was reduced at the beginning of the fiscal year, and instructed to devote the field season to supplementing the material already acquired, so as to prepare it for publication without future visits to the district.

The office at Salt-Lake City was closed on the 30th of June, and field operations were immediately begun. Mr. I. C. Russell, assistant geologist, proceeded to Mono valley, California, and carried to completion his examination of the existing lake and its ancient expansion. He included in his study, also, the six extinct glaciers which anciently debouched in the Mono valley, tracing them to their common source in the great névé of the Sierra Nevada. Incidentally he examined the ice-masses associated with some of the summits of the Sierra, and brought the camera to bear on them. These have been called glaciers by Muir and others, but are said by King to be unworthy of the name; and it may be hoped that these later observations and illustrations will suffice to place the matter beyond controversy.

From the Mono basin he proceeded to the Walker, Carson, Pyramid, Winnemucca, and Black Rock basins, for the purpose of re-investigating certain points connected with the history of the ancient Lake Lahontan, upon which he is preparing a report.

Mr. W. D. Johnson, topographer of the division, spent the summer, under Mr. Russell's direction, in surveys for a general map of the Mono basin, and is now engaged on a series of special maps of ancient glacial moraines.

Ensign J. B. Bernadou, detailed from the navy for the purpose, has acted during the summer as Mr. Russell's assistant.

Mr. G. K. Gilbert, who has general charge of the work, spent a few weeks in the field, visiting localities of special interest in the Lahontan, Bonneville, and Mono basins. He was accompanied in the Lahontan basin by Mr. R. Ellsworth Call, the conchologist, who is engaged in a study of the molluscan faunas of the quaternary lakes of the Great Basin, and took the field for the purpose of familiarizing himself with their geological relations.

The Champlain valley. — Mr. Charles D. Walcott, with Mr. C. Curtice as assistant, has been studying the formations between the archean and Trenton in Saratoga county, N.Y., and along up the Champlain valley on both sides of the lake.

Saratoga village, west of the fault-line along which the springs occur, was found to be built over a massive, gray, magnesian limestone, that carries a strongly marked fauna closely allied to that of the Potsdam sandstone of Wisconsin. The geologic section from

the archean to the base of the bird's-eye limestone was found to be of great interest. At Glen Falls, Essex, Ausable Chasm, and Chazy, N.Y., sections were taken, and collections formed.

The sections taken at Highgate Springs, Swanton, St. Alban's, and Georgia, Vt., by Professor Jules Marcou, were critically examined, and large collections of fossils secured. The data obtained show the dip of the Winooski marble series and the slates above, carrying the Olenellus fauna, to be the same. The five hundred feet of magnesian limestone, with its interbedded arenaceous layers, conformably underlie the Olenellus beds. The fauna at the Georgia locality was increased by the addition of eight species not before reported as occurring there.

NOTES AND NEWS.

MR. H. M. STANLEY contributes to the *New-Englander* an interesting, and, on the whole, clearly written study, entitled 'Evolution as bearing on method in teleology.' The essay follows a train of thought somewhat similar to the one stated in a book that appears almost at the same time, and that we reviewed recently; viz., Mr. Hicks's Critique of design arguments. Mr. Stanley is thankful to the doctrine of evolution for having rid teleology of a useless and somewhat dangerous argument, — the argument from mere ignorance; i.e., from our incapacity to explain certain singular or wonderful things save by supposing a powerful being directly working to produce them. This argument, which covers, on the whole, much the same ground as is covered by what Mr. Hicks calls teleology in the narrower sense, is regarded by Mr. Stanley as superseded by the doctrine of evolution. We now see that nature ought to be regarded as a 'practically infinite series of second causes;' so that, if we are now ignorant of the cause of any phenomenon, we still have a right to expect to find for it hereafter a purely natural cause. Every thing has grown; and we have to view nature as a vast and perfect machine, self-supplying, self-regulating, and not needing any workman to stand by to watch the steam-gauge, to put in the material, or to oil the bearings. Yet this view is not atheistic, according to Mr. Stanley; for the supposition of a designing intelligence remains, only this intelligence is 'immanently behind phenomena.' By this being, all things consist. In fact, the more nearly automatic the machine, the more perfect the contriving intelligence. "If an automatic locomotive-machine is a sign of very great intelligence, how much greater intelligence would an automatic universe-machine exhibit? . . . Teleology has been called a 'carpenter theory,' but a teleology which views the universe as a practically infinite automatic machine would forever destroy the force of any such epithet." In other words, as we understand Mr. Stanley, a 'practically infinite' carpenter would be something much better than a carpenter; and teleology gains rather than loses when the doctrine of evolution shows that the carpenter's tinkering of his work, if there is any tinkering, is practically infinitesimal. All this seems to us not at all novel; but, for the most part, it is very well put, and worth saying.

But when we inquire of any of these evolutionary design arguments, not how they defend themselves against the charge of atheism, but how they demonstrate theism, we are disappointed. Mr. Hicks, as we saw in reviewing him, is very definite on this point as to what he attempts, and as to what he does not attempt; but his definiteness only serves to show his weakness. He declares that order, as such, is proof of intelligence, but adds that the proof is solely inductive. Men are orderly because they are intelligent: hence nature, if orderly, must be somehow associated with intelligence. We answered this induction by asking whether all brilliantly colored objects must needs be visited by insects merely because the colors of flowers depend upon *their* relations to the habits of insects. But with Mr. Stanley we hardly have room for so definite a criticism; for, though his argument in favor of theism, in so far as he suggests one at all, seems to be inductive, it seems also most carefully to shun any such definite statement as should make it definitely answerable. The vast machine needs, it would seem, a controlling intelligence, which does not interfere with it, and yet does somehow direct it. The 'practically infinite series of second causes' is not enough by itself, and we must somehow get outside of it to find a designer; and, when we ask how the designer is related to the series of second causes, we get the charmingly innocent answer, that he is 'immanently behind phenomena,' — an expression that seems to us either mere words, or else an excellent Irish bull. Perhaps Mr. Stanley can explain this phrase for us; but meanwhile, as one casts about for an interpretation, one is reminded strongly of Brer Fox, in the wonderful tar-baby story, as he 'lay low' in the bushes, watching his creation the tar-baby while it slowly intrapped Brer Rabbit. Possibly Brer Fox was 'immanently behind' that tar-baby. But our criticism is only of bad arguments and of obscure expressions, not of the view itself that the order of the universe implies an intelligence. The latter we hold as positively as Mr. Hicks or Mr. Stanley, only we insist that the question is not in the least one of inductive science. The 'design' argument in all its accustomed forms is bad, because it is an inductive argument, applied as true empirical science never applies any inductive arguments; viz., to matters wholly beyond the limits of phenomenal existence. The whole question is one of philosophy. Not as a result of induction, but as an implied premise of the inductive, or of some other rational thinking process, must this doctrine of intelligence in nature be established, if at all; and therefore only a critical philosophy, that examines the assumptions lying at the basis of the thinking processes, has any business with the question. Empirical science, as such, has simply once for all 'no need of that hypothesis.'

— A fire broke out last week in the cellar of the building containing the geological collections at Amherst college. Fortunately it was discovered early, and put out by the students before any serious damage