case of the Roaring Run and Apollo wells, it may be possible that no porous stratum, which could serve as a gas reservoir, was pierced by the drill: this, as already stated (*Science*, July 17), is the first necessary condition of the existence of gas.

The Ridgway gas-well is located in a syncline, and not on a subordinate anticline, as has been suggested, but at a point where there is a certain regular dip of about 1° toward the west, on the side of the syncline. The Kane gas-wells — including the large one at Kane, which is now supplying the residents of the town with light and fuel, and the famous Kane geyser (gas) well — are both in a syncline, the south-east dip, in the one case, and the north-west dip, in the other case, toward the centre of the basin, being less than fifty feet per mile; and the south-west dip along the axis of the basin being from fifteen to twenty-five feet per mile. The great McMullen & Hallet gas-well, commonly known as the 'Mullen snorter,' is not in the vicinity of any anticline. The gas-sand at this well is nearly horizontal, having a dip of about eleven feet only in a direction S. 15° W.

The gas-wells found in the vicinity of the city of Erie are located in a region where no anticlines or synclines have been discovered. The dip of the rocks here is toward the south-west, at the rate of about twenty feet per mile, from recent surveys: or from the surveys made nearly fifty years ago, by the First geological survey, as pointed out by Professor Lesley, the average dip was estimated to be fourteen feet per mile. Gas-wells have been drilled in the vicinity of Fredonia, New York, one as early as 1821. Gas is still obtained here; and, as far as the structure has been made out, no anticlines exist in the vicinity of the Fredonia wells.

While these few facts would seem to be enough to show that all gas-wells, either in the vicinity of productive oil territory, or at considerable distances removed therefrom, are not necessarily in the vicinity of anticlines, many instances might be cited, particularly in the gas regions recently developed in Pennsylvania, to show that some of the largest and most productive wells are either on or in the vicinity of anticlinal crests. I am free to admit, as I have already done, that the position of anticlines and synclines have an important bearing upon the location of profitable gas-wells; but I cannot believe that, in view of our present knowledge, the 'anticlinal theory' is sufficient to account for all occurrences of natural gas. As to whether it will be possible for facts still to be recorded to give any geologist an adequate basis for the formulation of an ultimate theory, we must await the results of Mr. Carll's present investigation.

CHAS. A. ASHBURNER,
Geologist in charge Penn. surv.

907 Walnut Street, Philadelphia,
Aug. 24.

Annuaire géologique universel.

The undersigned being mentioned, under the name of Dr. *Svedonius*, amongst the collaborators in the above-named work recently published by Dr. Dagincourt in Paris, and two articles on Sweden and Norway appearing in the same, signed in my name, of which I had no knowledge *until after* their publication, I do hereby declare that the said articles are not composed by me, but are uncritically compiled from two pamphlets printed in the years 1874 and 1878, and are, consequently, now substantially antiquated pamphlets, with the authorship of which I had nothing whatever to do. These pamphlets, together with several others on the same subject, I have, at the request of a Swedish man of science, forwarded to Dr. Dagincourt, emphatically pointing out the time of their publication; and to this my collaboratorship in the annual is restricted.

DR. F. SVENONIUS,
State geologist.

Stockholm, July 31.

Probable period of gestation in the 'horned toad.'

On the 15th of May last I captured a very fine specimen of an adult female Phrynosoma Douglassii. The fact having long been known to me that these reptiles are capable of sustaining prolonged fasts without any apparent inconvenience, I determined to test the question for my own satisfaction and information. Accordingly, this specimen was placed where it was impossible for it to secure any food. One month after its incarceration it was taken out to be examined. No particular change was noticeable; the barest traces of emaciation could be seen in the limbs; but the creature upon being teased puffed itself up, as they do, and made short leaps with open mouth at my finger. It also ran nimbly about my study.

It was replaced in its limited quarters, and another month passed by without its having taken a particle of nutriment. Its eyes now had a slight sunken appearance, and some shrinkage of the limbs could be detected. I dipped it in water for a moment, and once more introduced it to its narrow prison. At this stage of the proceedings my chief surprise arose from the fact that the body of the animal still retained its rotund contour, and was, if any thing, plumper than at the time of the inauguration of the experiment.

Upon this date it had passed no excrementitious matter for nearly three weeks.

My surprise was great, when, in looking into the box on the afternoon of the 10th of the present month, to find strewed about the bottom of it no less than seven newly-born young. These were all dead, and enveloped in their membranes, which latter also enclosed a bright yellow yelk about as large as a small pea. At the time, circumstances prevented me from making any further examination; but, two hours later, my astonishment was at its pitch, when I found *fourteen* more young had come to light. Two of these were without the membranes and yelk, but every one of the twenty-one was dead.

Upon examining the mother, it was at once evident that her labor had not terminated; and, indeed, within the next ten minutes she was delivered of three more young ones. These were all born tail first: two of them were living, and had to be simply freed from their envelopes, the yelks having been absorbed. The remaining one was like the majority of the others, and lived but a moment or two.

As I write these lines I have before me twenty-two of the young in alcohol, two live and active little fellows of the same brood, and the mother-lizard, who, though she has lost much of her original activity and flesh during her *three months*' test, looks for all the world as fully capable of enduring many more days of it.

Taking all the circumstances I have related into consideration, I believe it will be found that about one hundred days is the period of gestation of this viviparous reptile.

It will be of interest to state, in the present connection, that other lizards endure these fasts as well as Phrynosoma; for I have a large Sceloporus, un-