pear.' If this refers to the common Missouri cactus, would it not be well to follow the Mexican in making it a useful food for cattle and sheep, by cutting the plant to the ground, and throwing it on piles of dry brush, which are fired, and the spines scorched off, when it is greatly relished by the stock.

CHARLES H. STERNBERG.

LAWRENCE, KANSAS.

THE SONG OF BIRDS.

TO THE EDITOR OF SCIENCE: Some time ago Mr. W. E. D. Scott contributed to SCIENCE an article upon the song of birds, drawing the conclusion that when isolated from their kind birds would originate a song.

In the building in which my office is located there is a canary that was taken from its parent bird when quite young, and grew to adult age entirely isolated from other birds. It has developed a song of its own made up, as nearly as I can distinguish, of but three tones sung as a phrase of seven notes. While the song suggests that of the ordinary canary it is not, I would say, actually any part of it; it is sometimes used singly, though generally repeated several times, and there is little if any variation from the original phrase or form.

WALTER S. KELLEY.

THE CONGER EEL.

TO THE EDITOR OF SCIENCE: The U. S. National Museum has recently received from the New York Aquarium a specimen of the larval form of the conger eel, which was captured in Gravesend Bay, N. Y. It measures four inches in length and is in a good state of preservation. Another specimen recently sent to the Aquarium was taken on the New Jersey coast.

Although the adult conger eel is common in New York waters, the *Leptocephalus* form has been recorded but rarely. Brevoort recorded its occurrence in the vicinity of New York City many years ago.

BARTON A. BEAN.

U. S. NATIONAL MUSEUM,
WASHINGTON, D. C.,
April 25, 1902.

CORRESPONDENCE OF THE LATE PROFESSOR LEIDY.

TO THE EDITOR OF SCIENCE: The undersigned has been collecting for some time the correspondence of the late Professor Joseph Leidy. Before the same is published, he would be indebted for any such which may be in the possession of the readers of SCIENCE. Care will be taken to return the originals if requested. Kindly address,

DR. JOSEPH LEIDY.

1319 LOCUST STREET,
PHILADELPHIA, PA.,
April 21, 1902.

SHORTER ARTICLES.

THE HYDROLYSIS AND SYNTHESIS OF ETHYL BUTYRATE BY PLATINUM BLACK.

KASTLE and Lowenhart have shown that the catalytic action of the enzyme lipase is reversible, *i. e.*, that it accelerates not only hydrolysis of fats into fatty acid and alcohol, but also the synthesis of fats from fatty acids and alcohol (*Chemical News*, February 8, 1901–March 15, 1901).

In an investigation on the action of enzymes which I began over a year ago at the suggestion of Professor Loeb, it occurred to us to try experiments with platinum black as the active principle in place of lipase.

I found that platinum black acts quite comparably to lipase. Platinum black hydrolyzes ethyl butyrate as well as synthesizes it from butyric acid and ethyl alcohol.

In my experiments the following chief facts were found:

1. Platinum black hydrolyzes ethyl butyrate, as is shown by the constant and definite increase in the acidity of the solution.

2. The velocity of the action is a function of temperature, *i. e.*, an increase in temperature from 0°C. to 40°C. is accompanied by a correspondingly increased hydrolysis.

3. The velocity of the reaction is a function of the quantity of the platinum black used; but independent of the quantity of ethyl butyrate used.

4. Platinum black synthesizes butyric acid and ethyl alcohol into ethyl butyrate. The odor of ethyl butyrate appears in a short time and increases with the increase in time.

5. The catalytic action of platinum black is diminished through the addition of small quantities of those poisons which, according to Kastle and Lowenhart, interfere with the catalytic action of lipase, *e. g.*, potassium cyanide, hydrogen cyanide, phenol, mercuric chloride, salicylic acid, silver nitrate, chloroform, sodium fluoride and others.

In all the experiments bacteriological precautions were used to exclude the possible influence of bacteria in these results. Control experiments showed that the above hydrolytic and synthetic action did not occur in the absence of platinum black.

My sincere thanks are due Professor Loeb for his helpful and valuable suggestions in these experiments.

A full report of these experiments will appear in the *American Journal of Physiology*.

Hugh Neilson.

Hull Physiological Laboratory,
University of Chicago,
April 12, 1902.

THE JACKSON OUTCROPS ON RED RIVER.

The Jackson stage of the marine Tertiary appears on the Red River in Louisiana at three points, known to the writer from recent inspection. The northernmost outcrop is the well-known long low bluff at Montgomery, which is probably the most extensive and prolific exposure of the stage now existing. The fossils are contained in profusion in a light blue-gray argillaceous marl, the bed being some six feet in thickness and having a very pronounced even dip, through the approximately quarter mile of exposure, of about one foot in fifty along the straight course of the river, which is here nearly due south, until it disappears beneath the surface at low water.

The next exposure occurs about a mile and a half below the Montgomery outcrop, on the estate of Mr. T. W. Kimbrel. These beds, which are also exposed along a line bearing but a few degrees east of south, have so slight a dip that they appear to be practically horizontal to the eye and are composed for the greater part of greenish-black and brick-red clays. This deposit is not so rich in species as the Montgomery bed and is much more limited in horizontal extent; it bears nearly due south from the Montgomery bed.

The third exposure occurs at the eastern base of the high and very picturesque bluff, more than a mile in length, about three miles below the Kimbrel beds and limiting the estate of Mr. John Young, and is in like manner composed of blackish and red clays; it bears about thirty degrees south of east from the Kimbrel deposits and may be known as the Young's Bluff bed. Both the Kimbrel and Young's Bluff beds are characterized by a profusion of a large *Pinna* and of *Venericardia planicosta, Volutilithes* and *Pseudoliva*.

The Kimbrel bed belongs to a horizon noticeably distinct from the Montgomery outcrop and contains immense numbers of an extremely minute *Lucina*, which is without doubt one of the smallest known bivalves. It is suborbicular, generally a little higher than long, slightly inequilateral, with the posterior side more broadly rounded than the anterior, strongly inflated, thick and heavy in substance, with the hinge thick and strong, all the cardinal teeth large, and the lateral teeth also very thick and almost equidistant from the cardinal. The beaks are small and moderately elevated, the lunule long, narrow and rather ill-defined. The ventral edge is crenulate within and the exterior surface marked with feeble close-set lines of growth and generally also three or four deep concentric grooves of arrested growth. The length of the largest valve in an extended series is 1.35 mm., the height 1.4 mm. It may be called *Lucina atoma*, and is brought forward with a name at the present time because of its importance in being the characteristic fossil of the Kimbrel horizon.

It is impossible at present to state the number of feet of strata separating this horizon from the Montgomery, for it is probable that the latter stratum changes its dip shortly after disappearing below low water, but there are several changes in the nature of its fossils that indicate considerable lapse of time. This is shown, for example, in *Venericardia planicosta*, in which the hinge seems to be less developed and the substance of the entire shell thinner, and in *Volutilithes*, where the