tion and progress of the work, the preparation of which was undertaken in 1890. Financial support has been given by the British Association, the Royal Society and the Zoological Society, while the authorities of the British Museum have afforded continual assistance. The work will be to the student of animal life what the 'Index Kewensis' is to the botanist, and indeed far more, as the last-named work refers only to Phanerogams, whereas the 'Index Animalium' will include all groups of animals and both recent and fossil forms. The portion of the work already completed and in the press covers the period from 1758–1800 and consists of 61,600 entries.

THE Society of German Engineers, in Berlin, has undertaken the preparation of an international technical dictionary to be published in English, French and German.

SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of the Boston Society of Medical Sciences completes its fifth volume with the double number for May 23 and June 4, the index to the volume being issued with this number. From a small 16mo the *Journal* has grown to a volume of over 500 pages, although it shows at the same time the modern tendency towards specialization by containing more bacteriological and pathological papers than formerly. There is, however, much of general interest as well as important contributions to our knowledge of anatomy and physiology.

The Plant World for June contains 'Botanizing in Bermuda,' by Marshall A. Howe; 'Suggestions for the Study of the Hawthorns,' by W. W. Ashe, which notes that in place of ten species formerly recognized we know that at least 120 species occur on the Atlantic coast; 'Cuban Uses of the Royal Palm,' by William Palmer, and 'Botanizing in and around a Lake,' by E. L. Morris, besides briefer articles, notes and reviews. The supplement devoted to 'The Families of Flowering Plants,' by C. L. Pollard,' treats of the Mimosaceæ, Cæsalpiniaceæ, and the Papilionaceæ. The number is well illustrated.

SOCIETIES AND ACADEMIES.

ONONDAGA ACADEMY OF SCIENCE.

AT the June meeting Mr. Chas. G. Rogers presented a series of observations made during March, April and May, on the dates of arrival of birds on their spring migration, the blue-bird being first seen on March 15, and the robin appearing three days later.

Mr. Geo. D. Lynch read a paper on 'Hawks,' in which he described the food, and the nesting and defensive habits of Cooper's hawk, the sparrow hawk and the red-shouldered hawk, illustrating his remarks with specimens of skins and eggs of each of the three species.

Principal John D. Wilson read a paper embracing his observations on a family of bluebirds. He constructed a box in the shape of a prism about six inches square and fifteen inches deep, two opposite sides stopping about two inches short of the top, thus forming two entrances, protected from rain by a projecting roof. A narrow shelf was placed just beneath each entrance. Sparrows seemed unable to utilize the box for nesting purposes and so left it alone. They gathered about, however, when the young birds began to appear at the entrances, but were soon driven away by the parent birds. After the young were hatched they seemed to be fed solely by the mother, who invariably entered and left the nest by the opening on the south side. The male entered either opening indifferently, never brought food, and usually brought out excreta from the nest. Mr. Lynch spoke of similar observations on a robin's nest. The young birds were fed entirely on caterpillars, while the parent birds ate freely of cherries, monopolizing one tree, and even brushing their wings against the head of any person attempting to climb the tree.

Mr. Horace W. Britcher spoke briefly of the habits of some of the forms of life inhabiting a small springtime pond in which a form of the fairy shrimp (*Branchippus gellidus* Hay ?) occurs. The pond is usually dry from July to November. Larval *Branchippus* appear in February, and eggs are deposited during late April and early May, the water becoming so warm by the middle of May that the *Branchippus* are rapidly killed. A year ago eggs were collected and an attempt

made during the summer, and again during the winter, to hatch them in aquaria, but without success.

H. W. Britcher,
Secretary.

DISCUSSION AND CORRESPONDENCE.

THE LARYNX AS AN INSTRUMENT OF MUSIC.

It is with considerable hesitation that I venture to enter into a discussion that has arisen in this Journal under the above title. It is so likely to become a discussion of terms that may be defined by different writers in different ways that it is, perhaps, a question whether a prolonged discussion of the subject is desirable. In spite of this fact, however, I take the liberty of expressing an opinion to which I have been brought by the past several years of observations upon the larynx. Of course, we may call that part of the larynx which vibrates a 'cushion,' a 'reed,' a 'membranous reed,' a 'cord,' a 'membranous cord' or other names, and still find much justification in each case. It seems to me that if we wish to discuss the question as to the class of instruments to which this belongs, we must judge it by two series of facts: first, what elements control the pitch of the fundamental tone produced; second, what is the quality of the tone produced. If we examine the larynx with these points in view, we find, in the first place, that the pitch of the tone produced is controlled by three mechanisms: first, one for increasing tension; second, one for decreasing the length; third, one for lightening the weight of the vibrating part. These three factors are those used for controlling the pitch of a string. If we examine the quality of the tone produced we find that the fundamental and over-tones form a series whose rates of vibration are to each other in the order of the natural numbers, 1, 2, 3, 4; etc., this quality of tone is the quality produced by a string and not the quality produced by a reed or membrane, in both of which the quality is much more complex and contains many intermediate over-tones. It seems to me, in view of these considerations, that we refer to this vibrating part as a 'cord' quite properly. It will be admitted, undoubtedly, by all that the tilting of the cricoid cartilage on the thyroid cartilage increases the tension on the vocal cords, and in so doing raises and tends to control their pitch. The arytenoid cartilages when brought together bring out the edges of the vocal cord from the side of the tube, and by their rotation may decrease the free length of the vocal cords, as is clearly shown by photographs that have been taken of the larynx when producing tones of different pitches. In Fig. 1 we have a section

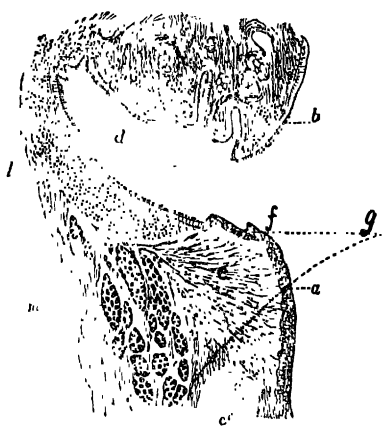

Fig. 1.

through the vocal cord and its immediate surroundings. It is shown in the relaxed position against the wall of the tube. The dotted line between $a \ldots g \ldots f$ shows, approximately, the position and form of the cord in action. In Fig. 2 is shown, diagrammatically, a cross-sec-

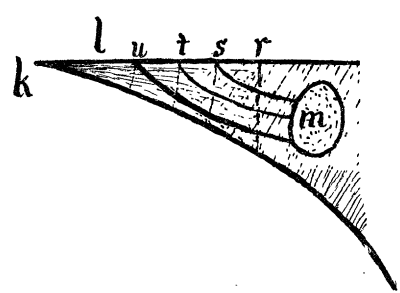

Fig. 2.

tion of the vocal cord, the point extension at k being rather exaggerated. m is the vocal muscle extending from the inside front of the thyroid to the outer side of the arytenoid, and passing through the back of the vocal cord. This muscle serves to rotate the arytenoid, and