nest containing a Cow-bunting's egg, over which was built another nest containing six eggs of the Goldfinch.

In the nest of the second form the walls are much thinner, and the general form and structure much resemble a Vireo's nest. These beautiful frail structures, however, are much better adapted to their position on the ends of branches than the thick nests would be if placed in that position.

The eggs are from three to six in mumber, most commonly five, blue, unspotted, save in the instance of two sets evidently belonging to the same pair of birds, which I found, one set in 1890, the other in '91, in the same tree. The eggs were finely spotted with reddish brown forming a wreath around the larger end. I have never heretofore seen an instance of spotted eggs of the Goldfinch noted in ornithological publications, and I believe their occurrence is somewhat uncommon. PAUL VAN RIPER.

PHYSICAL CHEMISTRY AT THE COLUMBIAN CONGRESS.

THE recent doctrines of chemical energy are pushing towards the front. The opening paper on physical chemistry was presented to the Congress by the writer of this report, who called attention to the valuable results arising from "the cross-fertilization of the sciences." The physical properties of substances have long been studied, under the name of chemical physics; such data are indispensable in chemical analysis, technology, etc. But, with transposition of the terms, we find more attention given to the properties of energy itself, and to the conditions of equilibrium, and of rapid or slow change. These generalizations promise to be most fruitful of results, and deserving of general recognition in our universities.

The second paper, "on chemical energy," was contributed by Professor Ostwald, of Leipsic, who is indefatigable, both in research and in expounding the progress of science. The two factors, capacity and intensity, are discussed and illustrated in this paper, with great perspicuity. Capacity is proportional to the mass; for two tons of coal, by combustion, will yield twice as much heat as one ton. To estimate the intensity, on the other hand, we may remember that heat conduction always implies some difference in heat intensity; so, a chemical transformation implies greater intensity of chemical energy in the reacting bodies than in the reaction products, under comparable conditions. A "chemometer" anologous to thermometer, though not yet complete, is not wholly unknown. Emphasis is given to the theorem, "two potentials which individually are equal to a third are equal to each other," with important deductions therefrom; and catalytic bodies are discussed in relation to the acceleration of chemical change.

A third paper, by Prof. J. E. Trevor, of Ithaca, states the fundamental equations of equilibrium, for three leading cases, and presents some extended mathematical deductions.

Three other communications, assigned to this section, are of more varied character. Prof. E. W. Morley stated by request some of his results in determining the atomic weight of oxygen, with remarkably close agreement, at about 15.88; but the work is still in progress.

Professor Lunge, of Zurich (whose genial presence added much to the interest of the Congress) described apparatus for promoting the interaction of liquids and gases. Perforated earthenware plates, of special form, are so placed as to promote contact of the reacting substances, —as in sulphuric acid manufacture.

Prof. T. H. Norton communicated a paper from Professor Orndorff, illustrating by models the stereochemistry of paraldehyde and metaldehyde $(C_2H_4)_3$. The three methyl groups are assumed in one case to be all on one side of the plane of the carbon-oxygen ring; and in the other case to be distributed on both sides.

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GREAT HORNED OWLS IN CONFINEMENT.

WHILE collecting in some dense pine woods early in April, 1886, I saw a great horned owl about every day which flew from a nest in a pine tree. This tree was the tallest of its kind in the vicinity, and the nest was at least seventy-five feet from the ground. Thinking I might secure its eggs or young, I climbed the tree and found, much to my disgust, that the bird used the nest only as a roosting place.

By patient watching and hunting I discovered its nest April 19, in a large chestnut tree. It was composed of coarse sticks and was lined with feathers and down from the parent bird, and had the appearance of having been a deserted hawk's nest.

Here I found two young birds which were covered with down and were about half grown. Their tail and wing feathers were just starting out. They tried to defend themselves like an adult bird by keeping up a continual hissing and blowing sound, and at the same time snapping their bills and opening and closing their eyes. I noticed that they occasionally made a low, murmuring sound, and also a louder and harsher note, which they make now when hungry.

In the nest with them were two half-eaten fish, *Catostomus communis*, and the hinder portion of two brown rats. When in confinement, a week or two later, they ate voraciously, and one day I offered one a dead mourning dove. It seized it head first, and in a very few minutes succeeded in swallowing it entire, except the tips of its tail feathers, which protruded from its mouth. I expected then it would fall a victim to its gluttony, but within a very short time the tail feathers had disappeared, and it remained very quiet for two or three hours, after that it showed no discomfort whatever from its meal.

April 27 they could walk quite well, and about June 15 the feathers started out on the head of the smaller bird, which I believe to be a male, although it was by far the larger when taken from the nest.

The feathers on the larger, or female bird, did not appear until July 4, and at this date the wing and the tail feathers on both were full grown. After this time they consumed but a small portion of the food they formerly did, although they occasionally ate voraciously. They seem to prefer rats, mice, birds and are quite partial to beef.

About the middle of October the larger, and what I believe to be the female bird, began to hoot, but not very loud. This is performed by the bird standing at its full height, with its ear-tufts (which were fully developed October 1) erect, but slightly slanting backward, and swelling out its throat it gives utterance to the notes, "waugh ho ho ho ho."

They recognize all strangers, and appear afraid of dogs, horses and cows, but always show fight and act on the defensive. Their way of showing fight is to lower their head and tail, and spread their wings to nearly their full extent, but arching them so as to protect their body, and at the same time utter a peculiar blowing or hissing sound, accompanied with a snapping of their bills.

They have been confined in a large cage for over seven years, and during this time have showed no inclination to breed, and when not disturbed have made no attempts to escape, but sit quietly on their perches through the day. Just after dark they move about considerably.