cold air at the rate of about 5,000 cubic feet per hour, at a temperature 50° below zero, when working at a speed of 140 to 160 revolutions per minute, which is capable of being continuously maintained, provided the water supply and lubrication are attended to.

The chamber with which this machine is connected is 15 feet long by 20 feet broad and 9 feet high, and in the hottest days of the late summer its temperature was easily reduced to from 30° to 40° Fahr. by six or eight hours' working. There can be no doubt but that this machine will be found exceedingly useful for the preservation of food and other perishable goods in places where steam power is inadmissible, but more especially in the climates where high temperatures prevail.

We are pleased to note this practical advance, which has been made by Mr. J. J. Coleman, who was the first to make mechanical refrigeration a success on board ship, where it is now very extensively employed. Scarcely three years and a half have elapsed since he sent out to New York the first cold air machine successfully used in bringing meat across the Atlantic. At the present time machinery on the lines designed by Mr. Coleman and partners, and known as the Bell-Coleman machines, are fitted up in various parts of the world, their steam cylinders being capable of indicating in the aggregate 4,000 horse power, and their cooling capacity being equal to the freezing of 200,000 tons of meat per annum. These machines are working not only between America and Great Britain, but also between Australia, New Zealand, and India, and this country.—*Iron.*

THE ELECTRIC LIGHT IN SURGICAL DIAGNOSIS.

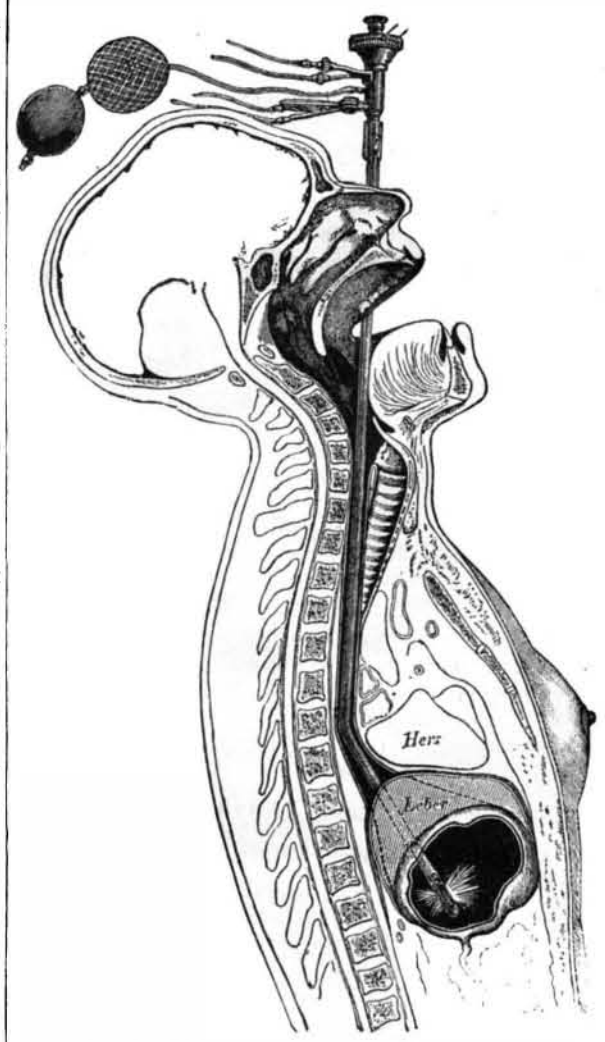
We find in a recent number of *Annals of Anatomy and Surgery* a very interesting contribution by Dr. Roswell Park, of Chicago, in which he describes the most recent applications of the electric light for surgical purposes. It appears that Josef Leiter, a well known instrument maker of Vienna, has at last succeeded in producing electrical instruments by which the interior portions of the human body may be strongly illuminated by the electric light, and thoroughly examined by the eye of the surgeon.

The accompanying engraving shows the application of one form of these new instruments, called the gastroscope, an instrument for the examination of the stomach. It consists of a bent tube, which contains a window at one end, electric wires, tubes for the introduction of a water circulation, by means of rubber bags, for the purpose of keeping the tube cool while the electric light is burning; also for the introduction of water into the stomach, to distend the same. The lower extremity of the tube is provided with a platinum wire, which is made to glow under the electric current, which is produced by a battery. The tube is also provided with reflector prisms and lenses, for directing the light through the tube.

The eye of the surgeon is applied at the upper end of the tube, after it has been inserted in the stomach in the manner indicated in our sketch.

As preparation for the use of the gastroscope, it is necessary that the patient shall have gone for some hours without eating. Half an hour previous to its use a hypodermic dose of morphia, say one-third grain, should be administered. Just prior to the examination the stomach should be washed out. The patient is then laid upon the left side on a table, having a head support, which shall keep the neck in its axial position. A small receptacle is placed under the mouth to catch the saliva which cannot be swallowed. The head is then thrown well back, and the instrument, which has previously been lubricated with vaseline or glycerine, is guided by the finger of the left hand and passed downward with a gentle sweep.

Previous practice on the cadaver with a hard rubber sound of the same dimensions and flexure as the gastroscope will



THE ELECTRIC LIGHT IN SURGICAL DIAGNOSIS.

easily teach the necessary manipulations. The instrument being in place, the stomach is inflated to the desired extent, but not sufficient to distress the patient. The pointer on the rheostat being turned slowly, the metal blind is drawn (at J), and the observer has the field before him.

By the curve in the tube not only is the introduction of the instrument facilitated—it having been found impossible to pass a perfectly straight tube so far as is necessary for this purpose—but it will be seen that with partial rotation of the tube about the long axis of the straight portion, the extremity carrying the window and the light makes quite an excursion, and permits the view of a much more extensive surface than would be possible were no such excursion made.

Moreover, as it is provided with an optical system, it obtains that as the instrument is rotated toward a given point of the mucous membrane its image is enlarged; while as it is further removed the image is diminished, while the field is enlarged. At a distance of two centimeters the image is of natural size. The "definition" of this system is excellent, and, granted a tolerance of the instrument on the patient's part, and the requisite skill on that of the observer, a very satisfactory examination can be made.

A variety of other instruments are made, which are operated substantially in the same general manner as the one described. For example, we have the laryngoscope, for examination of all parts of the throat; the œsophagoscope, for the gullet; the otoscope, for the ears; the urethroscope, for the bladder; the cystoscope, etc. The invention of instruments marks another step in electrical progress. They promise to be of utility and importance to the medical profession, for by their use many parts of the human system heretofore hidden from the eye may now be brilliantly lighted and examined, and their condition in disease and health ascertained.

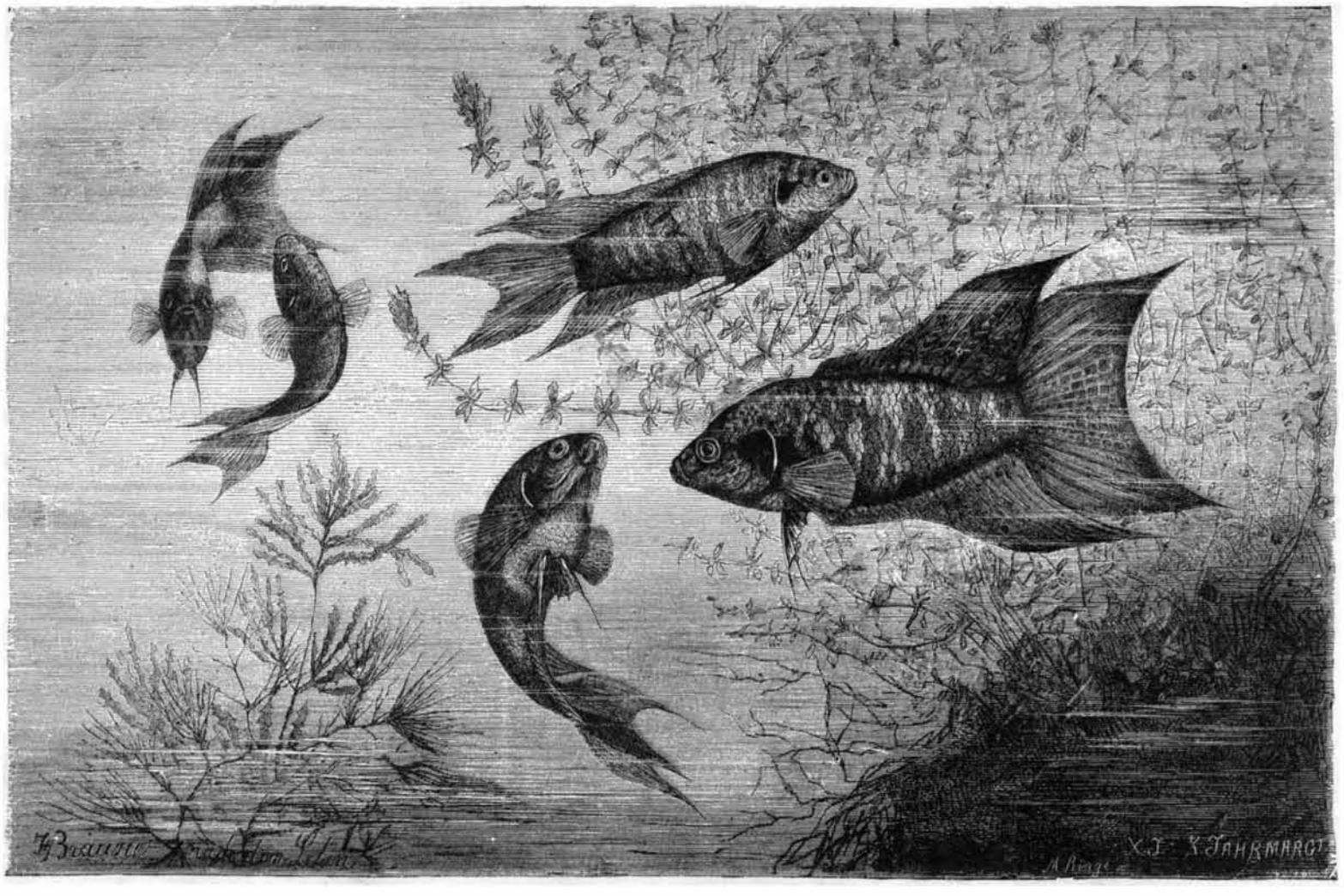
THE PARADISE FISH.

The paradise fish is a representative of the family *Macropus.* These fish have very large fins, less developed in the female. The brownish color of the upper side changes into a greenish gray on the lower side; the markings consist of changeable yellowish green or blue and red cross lines. Their length is from eight to nine centimeters.

Very little is known of these fish in their free life. They are universally kept in captivity in China, and treated as our gold fish, but are more easily propagated in a limited space.

They are better adapted for household pets than other fish of this class, as they can live in a much less quantity of water, and can remain out of the water for twenty minutes and more without injury. Giraud brought one hundred of these fish from China, and although during the tedious journey he was not able to give them sufficient room or the necessary care and nourishment, twenty-two of them lived.

Benecke says that "in May of the year 1878 he obtained a pair of paradise fish. They were placed in a basin containing about forty liters of water. They immediately went to work to devour the small crawfish and larvæ of insects which had been placed in the vessel. After these were consumed two crawfish, water fleas, and mussels were put in. The mussels they had not received before, and evidently had never eaten them, for at first they only took hold of the little animals and then released them with a shake of the head, but after a day or two they only ate the mussels, leaving the water fleas placed in the basin unmolested. One day no mussels could be obtained, and they ate greedily not only small but very large angle worms from five to eight centimeters long and two millimeters thick. They always rejected the intestines of the worms. When the worms were put in the basin, as they were taken from the ground, they would shake them two or three times, then let them go, then throw them around in the water, in order to shake off the dirt before eating them. If the worm struggled, they would sling it against the water plants or the sides of the basin.



THE PARADISE FISH.