

EUDYNAMIS NIGER.

The islands of Oceania and Southern Asia harbor a little group of cuckoos (*Eudynamis*), which are characterized by a thick, strong, hooked beak that is very much curved on the top, while the under jaw is almost straight, strong feet, wings of medium length, and a long rounded tail. The male is usually black and the female is more or less spotted with black and white.

The best known of this species is the *Eudynamis niger* or *Cuculus niger*. The male is a brilliant greenish black, the female dark green with white spots on the back, white bands on the wings and tail, and underneath it is white with black spots, which are elongated near the neck and are heart-shaped on the breast. The eye is scarlet, the beak pale green. The length of the male is about 16 inches and of the female about 18 inches. This bird is found all through India and on the Malay peninsula and the Philippine Islands. He lives in gardens and groves, feeding mostly on fruits.

The female seems to deposit its eggs only in the nests of the two species of crow found in India (*Corvus splendens* and *Corvus culminatus*). And these eggs are so often found alone that some think that the mother bird destroys the crow's eggs contained in the nest where she wishes to deposit her own, while others maintain that the young cuckoo throws the young crows out of the nest; we have also seen it stated that the mother crow raises the whole brood together, bestowing the same care on the little interloper as on her own young ones.

The natives of India are very fond of these birds and give them various names, which are an imitation of their notes, which please them so well that they often cage the birds, prizing them as other people do fine singers. The European finds their few notes very tiresome. For our engraving we are indebted to Brehm's *Thierleben*.

The Cant That Makes Trouble.

As Senator Hoar told the students of a summer school at Worcester, recently, this country itself "is nothing but a great labor organization," and the Debs strike "is nothing but a little labor union rising against a great one."

The assumption of Debs and his crew that there is in this country a distinct class called Labor, and that they represent it, does violence to every American principle and tradition.

In truth, labor and toil have been the lot of people from the beginning. They are all laborers here, or, at least, the drones are so few that they are not worth counting. The proposed Populistic income tax is made to discriminate against people with incomes exceeding \$4,000; and how many are there of them? Only about 85,000 out of 70,000,000 people, according to the estimate of the framers of the vengeful imposition. Of these 85,000, too, how many get their incomes without regular labor on their part? The number is not 8,500. Even the richest of them are oftentimes the hardest workers, and the great mass of them is made up of people who have gathered by toil accumulations which they keep only by constant industry, or of men who are laboring day by day in the professions or in business. Hardly more than one in ten of them has any money which was not made by his own ability and industrious application. In the whole Union there are not more than a hundred large fortunes which were not built up by the personal exertions of the men to whom they now belong. Take the rich railroad men. All of them, two or three families excepted, began poor. Nearly every superior railroad officer has worked his way up from the bottom of the ladder; and the same possibility of ascent remains for those who are low down. They are all laborers together, from the superintendent down to the switchman, and each is paid according to the value of his services.

It is a disgrace to an American that he is willing to be included in a specific class designated as Labor. Is he not an American citizen? Has he not an equal voice in the government of the republic? Why should he speak of himself as if he belonged to one of the fixed social gradations of an aristocratic system, when he is a member of a society in which all are laborers, and in which the capital is almost wholly held by men who began where he is, poor though he may be?

In this country there are no classes. There is only

one class, and all the citizens belong to it. To speak of Labor as a distinct social classification is to outrage the spirit and the principle of our institutions. It is not the sort of talk befitting Americans.—*New York Sun*.

Colorado's Newest Railroad.

Owing to the assured richness of the Cripple Creek gold district, two railroads—one tapping the Denver and Rio Grande, at Florence, and heading north, the other running south from Divide Station, on the Colorado Midland—have been projected and pushed forward with all possible energy during the past few months.

The Florence and Cripple Creek Railroad will open through to Cripple Creek on or about July 1. At the present writing its northern terminal is Victor, one of the principal towns of the Cripple Creek district, and connection is made at that point with six-horse stages running to the famous mining camp. The distance from Florence is a trifle over forty miles, and the ride is one of the prettiest and grandest in all Colorado. It was my privilege during the past week to make the trip, going in by way of Florence and out *via* Divide, and I predict that when these lines are completed, this little circle will become the most popular of all circle trips for tourists in Colorado. A steep climb from Florence takes you to the top of *Mesa* and affords a lovely view. Looking to the south, you see the myriads of oil wells marked by towering trestles, while the whole landscape for miles is dotted with enormous oil

trouble, with its fort-clad peak. Winding and twisting and even climbing we pass close to the Strong mine, with its shaft-house destroyed, and the ground around it blackened by the explosion of an enormous charge of dynamite set off by the unruly element of the strikers, while eleven non-union men were in the drifts below. Fortunately and miraculously all escaped unharmed after two days' imprisonment in the mine. Fine shaft houses are here seen on all sides, for we are now on one of the richest mountains in the district. Passing numbers of log huts and rudely constructed cabins, we come to Victor, the present terminal station, crowded with miners, soldiers, and idle men awaiting the mail and the Denver papers. Cripple Creek is still an hour's run by stage, so mounting to the top of the big "Concord," with its six horses, I watch the scene with intense interest. All is new to many of our passengers, as is evidenced by their excited manner and numerous questions. A motley crew of all sorts, colors and conditions finally crowd into and on top of the stage, and we are off.

The Florence and Cripple Creek Railroad, which we have just left, is 40 $\frac{1}{2}$ miles in length, has a grade varying from one to almost four per cent, is admirably constructed, and cost on an average \$17,000 per mile, not including stations and terminal properties.

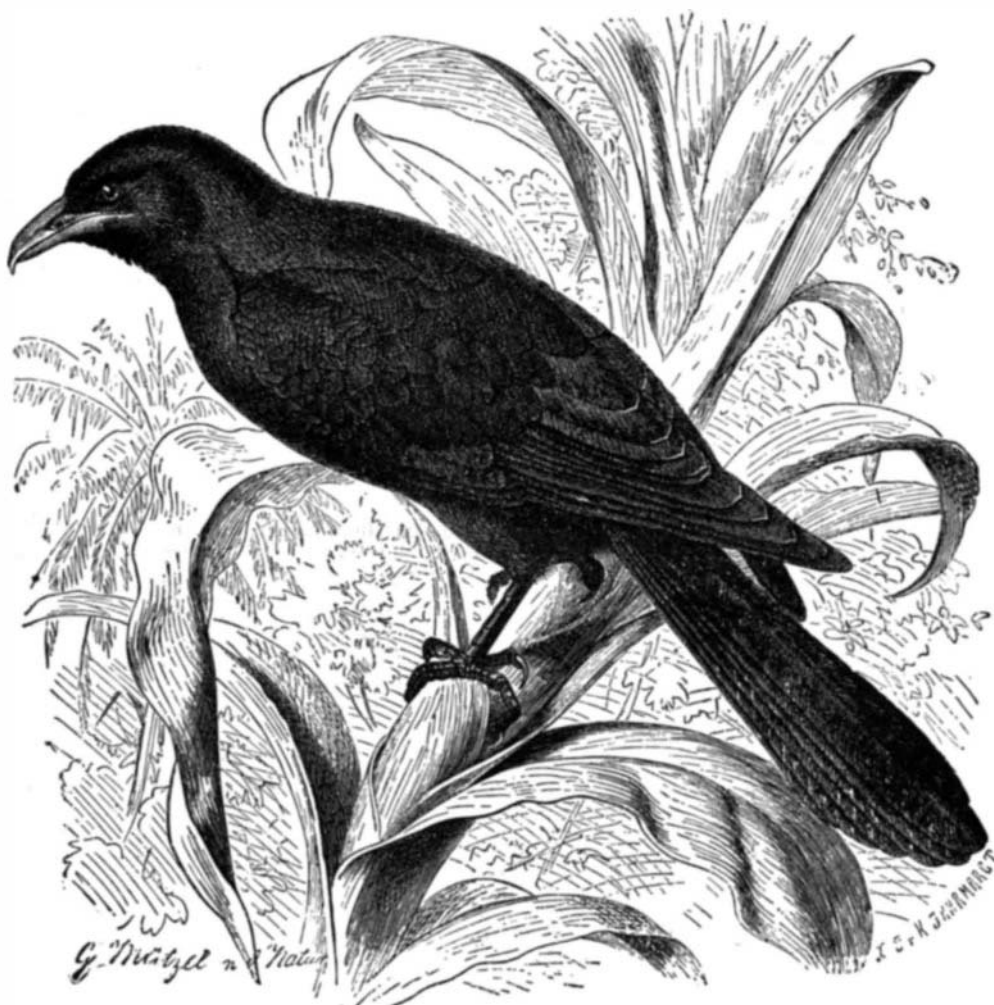
Many of its curves are of 30 degrees, but so well laid and accurately raised that none of that disagreeable creaking or "singing," as the flange plays against the curve, is heard. Being a narrow gauge railroad, it was enabled to purchase at a low figure from the Denver and Rio Grande its supply of equipment, unused by the former company since the widening of its gauge to the standard. The future of the camp insures the prosperity of the line, and even at the present time its earnings are most satisfactory.

As we drive from Victor to Cripple Creek the grade of the new road is seen winding along the mountains, and hundreds of men are busy laying the steel and making ready for the early opening.

Down through the gulch plunges our heavily-loaded stage, and through one continued succession of settlements we rush on a gallop, till, at the end of an hour, the arc lights of Cripple are seen. Pulling up at the hotel, another crowd welcomes us, and such a crowd! All quarters of the world, except China, have contributed to the population of this camp. Chinese are barred by local edict, and woe to any ambitious Celestial who seeks his sanitary mission within the confines of Cripple Creek. It may be unconstitutional, but the edict is none the less effective for a trifle like that. The large, gaudy office of the miserably wretched hotel is crowded far into the night with men on all errands, but every man in the outfit can produce at least one piece of rich ore from his corduroy suit with most wonderful details as to the width of that particular vein and the richness of its assays.—*New York Railroad Men*.

Glass Coloring in Germany.

The beautiful coloring of certain varieties of glass now produced in Germany, and which is said to far excel some of the most noted French specimens, is an art practiced by the glassblower at the furnace, by means of an apparatus consisting of a sheet iron cylinder, 20 inches long and 8 inches diameter, standing vertically, and having a similar cylinder riveted across the top. *Kuhlow's German Trade Review* says that in the lower cylinder is an opening into which an iron ladle can pass, and the horizontal cylinder is provided with doors at either end, the one nearest the operator being so arranged that the blowpipes can be supported when the door is closed in a horizontal split running to its middle, the object to be treated being held inside. While the glassblower is reheating his work for the last time in the furnace, an attendant takes the long-handled iron ladle, which has been heated red hot, shakes into it about a spoonful of a specially prepared chemical mixture, and places the bowl of the ladle quickly in the opening provided for it in the vertical cylinder. The mixture immediately gives off vapor, which rises to the horizontal cylinders, where, meanwhile, the blower has placed his work, supported by the blowpipe and heated to an even red, turning it rapidly in the vapor. In a short time the object is covered with a changeable luster, is removed from the pipe, and tempered like other ware in an ordinary oven, then cut, engraved, painted, or gilded as desired.



EUDYNAMIS NIGER—YOUNG MALE. (One-half natural size.)

tanks, now nearly all under control of the Standard Oil Company, while beyond and to the west extends the most glorious of all ranges of the Rockies, the Sangre de Christo, the snow-topped peaks standing in bold and beautiful contrast with the bright green of the lowlands. Then comes the canon with its interminable windings along the banks of the stream which is crossed and recrossed no less than nineteen times within two miles on truss bridges.

Puffing and snorting, our little narrow-gauge engine with its train of three cars toils and struggles up the grade, and at every turn the scene grows wilder and more beautiful. We are fighting with every revolution of the drivers, right into the very heart of the Rockies now, and with me the sensation of riding over a new piece of road is so novel, I became positively enthusiastic. Out of one canon, we plunge again in another, and at the farther end of this one make a detour of almost a complete circle before commencing the climb up the mountain. In a few minutes four tiers of track are seen below us, and when the summit is reached the scene is one of the finest I have ever looked upon. Dense foliage of the graceful quaking aspen and the sturdy pine covers all the mountains in the foreground, while again the Sangre de Christo forms the horizon to the south and west, its peaks standing in witching silhouette against the bluest and clearest sky in the world. And now we are approaching the richest treasure ground on the continent. Prospect holes are seen on all sides. Blue-shirted miners with laced boots are seen at every hand; then comes in sight Blue Hill, the stronghold of the striking miners during the recent

[FROM THE MOUNT LOWE ECHO.]

Saturn and His Eclipses.

The story of Saturn would be incomplete were I to omit in its recital to mention the vast number of total eclipses both of the sun and of the satellites themselves, and of the enormously long duration of those of the sun by the rings as seen from various latitudes both north and south of his equator.

The nearest satellite revolves around the planet in $22\frac{1}{2}$ hours, going through all its phases from new moon to full and back from full to new so rapidly that the changes, both in position and phases, would be visible to a Saturnian inhabitant. Seen first in the west as a narrow crescent, it would in five hours grow to a full round face, and would have moved half round the sky or over a space equal to the apparent size of our moon in two minutes. If the months of Saturn be reckoned by this satellite, there would be nearly thirty thousand of them in his year, or two and one-half times as many as our year has hours. But as he has, at least, eight attendant moons, there is opportunity for speculation as to which of these orbs should have the honor of regulating the length of the months.

Let the reader imagine himself on the great globe of Saturn, in, say, north latitude corresponding to that of any place in Southern California; he would behold three vast arches, the inner one nearly transparent, the middle one much the widest and opaque, and, outside of this, a much narrower one, also opaque, all extending east and west from horizon to horizon. In the spaces between these arches he could distinguish the stars, some of the satellites, and, occasionally, the sun. Were he situated in, say, 20 degrees north latitude, at a certain season of the year, he would see the sun rise clear of the ring on the northern side, pass diagonally across them, being partly obscured while behind the crape ring, but shining brightly while in the space between it and the middle bright ring, and, passing behind that, would be totally eclipsed, but emerging, would cross the 1,700 mile interval between it and the exterior bright ring under which it would suffer another total eclipse, but from which it would finally reappear and pass the meridian clear of them all. In the afternoon a like series of eclipses, both total and partial, though in reverse order, will be witnessed, the sun setting, as it rose, clear of the rings. And this arrangement will last with but slight variation, during some part of the day, for 11 years and 306 days. In latitude 40 degrees north, the sun will, at a certain declination, both rise and set totally eclipsed, being seen unobscured only at mid-day, for the space of one year and 23 days. At this same latitude, with the sun's declination such that his apparent daily motion is paralleled with the rings, the sun as he climbs higher will, after many partial eclipses, pass behind the ring and a total eclipse, lasting from sunrise to sunset, will be produced. Each day on that planet as on the earth at this season of the year, the sun gradually ascends till his greatest declination north is attained, but always behind the ring. His descent then begins, but thirty times slower than that of our sun after June 21, until finally his lower limb emerges from the ring, when totality ends after having endured all through each day for a term of six years and 236 days or 5,543 Saturnian days. Following this, for a long time, the eclipses will be partial until the sun is clear of the rings.

Astronomers on our planet hail with delight the coming of a total solar eclipse, and hie themselves to the uttermost parts of the earth to observe its varied and interesting phenomena, even though it shall last but the brief space of two minutes, as the occasion is one of great value for the determination of the cause and nature of the sun's corona and many other matters pertaining to its physical nature, but what must their emotions be at the reflection of an eclipse so extended as those we have described? LEWIS SWIFT.

Low Observatory, Echo Mountain, June 23, 1894.

The Danger Point of Burning Oils.

A demonstration of an interesting series of experiments upon the relative flash and danger points of mineral burning oils of Scotch, Russian, and American origin took place at Linlithgow recently. The first experiment was made with Professor Abel's regulation test apparatus, in which oil is heated in an inclosed vessel two inches in diameter until the flash point is reached. The sample tested was an American oil known as the Royal Daylight. It lighted at a temperature of 76°, or 3° above the government standard. To show the arbitrary character of the government test, a sample of the same oil was taken and placed in a vessel nine inches in diameter of exactly similar construction to that of Professor Abel, and in this case the flash point fell to 69°. Next a popular Russian oil was tested, and was found to flash with the Abel apparatus at 84°, and in the extended experiment, when the larger body of oil was used, at 79°.

Mr. Bishop, the chemist to the Linlithgow Oil Company, who conducted the experiments, next proceeded to illustrate the fire test. Filling a miner's lamp of the ordinary construction, he placed a small spirit lamp under it, applying a light to the oil repeatedly as the temperature rose. At 90° the oil flashed; at 105° it

burned for a few seconds; at 110° it burned steadily until extinguished by the closing of the lamp. Subsequently the ordinary No. 1 oil of the company was tested by the regulation apparatus, a slow, tedious operation, for it did not flash until a temperature of 116° was reached. A number of Young's duplex metal lamps charged with Scotch, American, and Russian oil, which had been burning for some time, were also shown. A thermometer having been inserted into the several lamps, it was found that the temperature of both the American and Russian oils stood at 90° (or 17° above the standard), and of the Scotch oil at 88°. With a glass or a china lamp, the temperature in each case would have been several degrees lower, and it was further stated that from the construction of the lamp in ordinary circumstances no danger arose from the high temperature *per se* in the case of either of the foreign oils. In the event of an accident occurring, however, the results might be serious; and this Mr. Bishop next proceeded to demonstrate. Pouring a small quantity of American oil heated to 88° into a small metal cup, he applied a light and the oil immediately ignited. With the Russian oil the result was similar, though the flame did not so quickly catch the oil. Next the lighted match was thrown into Scotch oil, also heated to 88°, when the light was at once extinguished.—*Chemical Trade Journal*.

California Borax Mines.

Though every now and then reports come from the desert of rich finds of gold and silver, yet the greatest industry of Death Valley and the desert is the mining and working of borax. Twenty years ago borax was first discovered in California, west of the Slate range, seventy-eight miles from Mojave, the discoverer, John W. Searles, forming a company known as the San Bernardino Borax Mining Company, erected works which have been in constant operation ever since.

The borax in the crude state forms a crust over the marsh. This crust is removed, hauled to the works and placed in solution in immense tanks heated by steam. After allowing the solution to settle, it is drawn off into cement vats, where it is allowed to crystallize. This operation is again repeated, when the borax is ready to be sacked and shipped to market. After the removal of the borax from the marsh, crystals of tincal again begin to form, which are worked but once, when they are in a salable condition. In order to facilitate this operation, water from the marsh is pumped into large tanks, in which the tincal forms.

These works are models of mechanical construction, and are the best equipped on the desert. To the uninitiated, borax working is but a repetition of boiling, settling and crystallizing. The fuel used is crude petroleum, which is hauled in huge tanks from Mojave.

The teams used in the transportation of the refined product are curiosities in their way—a wonder to the tenderfoot and a surprise to the teamster. As these wagons are the greatest in existence, carry the heaviest loads and are seen no other place, a description is in order. The hind wheels are seven feet in diameter, front wheels five feet; hubs, eighteen inches in diameter by twenty-two inches in length; tires, six inches wide and an inch thick; steel axles, three and one-half inches in diameter; bed, sixteen feet long, four feet wide and six feet deep. Each wagon weighs about 8,000 pounds, and is capable of carrying 20,000 pounds at a load. Two wagons loaded with borax and an oil tank on a third wagon complete the train hauled by the borax team. The team consists of eighteen mules and two horses—twenty animals in all, which are driven by a bell cord, used as a jerk line. A carload (40,000 pounds) of borax is hauled each trip from the works to Mojave, and a tank of oil and two loads are hauled on the return trip.

It takes eight days to make the trip, and in nearly twenty years not a trip has been missed. Stations at which water can be had, and where feed is stored, have been erected for the borax teams to put up. The borax company has done much to assist in the development of the desert, as water is furnished free of charge at all their stations.

From the borax mine, twelve miles from Daggett, wagons of the same style and teams similar in makeup are used by the borax company. Not all the borax of Death Valley and the desert is found in marshes, and all the marshes, while having the same appearance, do not contain borax.

In Furnace Creek canon of the Funeral mountains, and in the Death Valley marsh, borax is found in the shape of cotton balls, while in the San Bernardino Company's marsh none of these are found. The cotton balls are borate of lime and are scientifically known as urexite. On taking them from the ground they can be pulverized easily, but after exposure to the air they become very dry and hard. They become so hard that it is necessary to put them through a crusher.

For months after the discovery of borax hundreds of prospectors braved the terrors of Death Valley, and many left their bones to bleach in that terrible sink-hole. Borax was searched for in unheard-of localities, but it was only known to exist in marshes and beds of

old lakes. It was not until the discovery of silver in the Calico mountains that borax was known to exist in deposits or veins. A miner, more curious than his fellows, had a piece of white-looking rock assayed, and made the wonderful discovery that hundreds of prospectors had traveled over a vein of boracic acid more valuable than any marsh then known. This was a set-back to all preconceived notions of borax mining, and the supposed-to-be valueless white rock of the Calico mountains became suddenly valuable. This is only another case of where the values at home were overlooked for the much-talked-of treasures of a far-off land. The deposit at Calico is owned by the Pacific Coast Borax Company, and the product is shipped to their works at Alameda for reduction.

Another and larger deposit of the same class was found at Monte Blanco, in a branch of Furnace Creek canon, but its great distance from a railroad made the working of it an impossibility.

In Death Valley are the rotting remnants of two borax works—institutions which promised, for a time, to make their owners rich. With a fall in the price of borax and the establishment of more accessible rivals, abandonment was forced upon the owners. The works north of Furnace Creek, which were erected to utilize the product of Winter's discovery, closed in 1888, after a run of five years. The Eagle works, erected at a marsh belonging to a Frenchman named Daunet, have also been closed down for several years.

Throughout all this country, with the exception of Death Valley, may be found the stakes of the railroad surveyor, and several practical routes for a railroad have been found, though none have yet been decided upon. At the time of the discovery of borax in California, the wholesale price was 50 cents a pound. At present it is worth about 8 cents. Over 20,000 tons are used annually, about one-third of which is produced in the United States.

Vibrios in River Water.

A recent number of the *Arbeiten d. Kaiserlichen Gesundheitsamte* contains an interesting paper, by Dr. Dunbar, on the detection of cholera vibrios in river water. As many as 4,100 samples in all were examined, 855 being abstracted from the river Elbe alone, while samples from the Rhine, Weser, Oder and other rivers were also submitted to the special tests necessary for the isolation of cholera vibrios. The investigations were begun at the beginning of last August, and were continued until the middle of December. Only those vibrios which gave the cholera red reaction were submitted to further cultivation and examination. Dr. Dunbar exercises great caution in the classification of the numerous vibrios he has isolated, and although in all important respects it was impossible to distinguish them from undoubted cholera vibrios, yet he prefers to describe those obtained from the river Elbe as Elbevibrios, those from the river Rhine as Rhinevibrios, those from the river Oder as Odervibrios, and those from the river Amstel as Amstelvibrios. Some of these vibrios when cultivated in ordinary peptone broth in the presence of air and at a suitable temperature, gave rise to phosphorescence, a phenomenon which was never obtained with the cholera vibrio; but even this failed to serve as a mark of distinction, for out of 68 cultures in which this characteristic appearance was exhibited, 38 only gave it occasionally, losing this power in some instances and exhibiting it in others. Elbevibrios were detected in the vicinity of Hamburg from July 19 down to November 4; after that date, although samples were daily examined, none were found. But whereas these cholera-like vibrios were not found after November 4 in the running water, they were found more than a month later, on December 19, in the mud at the bottom of the river; the latter, remarks Dr. Dunbar, probably offering them an opportunity of remaining in a dormant condition for considerable periods of time until chance and suitable circumstances enable them to become again redistributed in the stream itself. These Elbevibrios were found on 21 occasions in the tap water as delivered to the city, and once in this water after passing through a Berkefeld cylinder, which was investigated on fifty successive days.

Petroleum in Sumatra.

The deposits of petroleum discovered a few years ago in the Province of Lanhkat, in the northern portion of the island of Sumatra, and along the coasts of the Malacca Straits, are being rapidly developed. Concessions have been granted by the Dutch Indian government to both Dutch and English capitalists, but at present only the Dutchmen have worked their concessions. The area of the lands conceded amounts to 318 square miles, and it is believed that this portion of the island is very rich in petroleum. The wells are put down very near to the coast, so that the expense of carriage and shipment is not heavy, and, as the quality of the oil is very good, it is thought Sumatra may, before very long, enter into serious competition with Russia and America, the more so as this portion of the coast possesses a deep and well-sheltered harbor.