of ore are mined and shipped each working day of the year.

The railroads which carry the product to the docks have been brought to the very mouths of the mine. The "skip" cars which convey the ore from the mine dump their contents into immense ore pockets, which in turn empty into the railroad cars waiting beneath to receive their load. When there is an over-supply of ore, the surplus is dumped on the stock pile. Mining never ceases. The aspect of the Norrie mine is very different from that of the Menominee range, where great ore pits can be seen. The Norrie is a mine in the true sense of the word; for there is no open pit, no evidence of the ceaseless activity far beneath the surface.

The mine now known as the Norrie includes workings in which were four separate mines formerly known as North, East, and West Norrie and the Pabst. Two additional mines, the Vaughn and the Aurora, are also operated by the company under the name of Norrie, but their product forms a separate account. If the output were included with that of the Norrie, the sum total would be much in excess of 1,000,000 tons per year.

ANIMALS THAT BLOOM AND PLANTS THAT EAT MEAT.

BY CHARLES MINOR BLACKFORD, JR., M.D.

In general, animals move about to seek food, while plants are fixed to one spot and get their nourishment from the earth in which their roots are imbedded and the air that surrounds their leaves, but there are species in each "kingdom" that do not follow the rule. Botanists know of plants that have neither roots nor leaves, of others that have one but not the other, and of others still that are undoubtedly vegetable yet move about as freely as animals would do. On the other hand there are animals that never leave the spot on which they first took up their habitation, and that seem to trust to luck for food. The oyster and clam have thus lost the power of locomotion. There are many that have been separated from the plants only by the researches of recent years. Sponges, corals, sea anemones and the whole "sea cucumber" group were long believed to be vegetable, and many blue water sailors think so to this day. There are animals that seem to blossom as freely as do flowering plants.

The sea anemone is one of the commonest of these. It is found clinging to rocks in sheltered places along shore in practically every part of the world, for it is not confined to any special region. It grows only in comparatively shallow water, that is in depths of less than five hundred fathoms, although there is one species that lives in the open sea, but wherever found it is essentially the same in structure. It is a tough, leathery tube, spread out below into a "base" that fastens it to a rock or other foundation, and expanding above into the flower-like "disk" with the mouth in the center. All around the opening of the mouth are curling tentacles, not unlike the petals of a modern chrysanthemum. Some varieties are almost or entirely colorless, while in some others the tentacles are gorgeously tinted and rival the flowers of the field; but in all lurks death in a certain and horrible form. Watch some little creature touch the curving arms, and they will be seen to curl inward and wrap the intruder in their folds as they push it toward the mouth. The inner sides of the tentacles are covered by poison glands that sting the prey to insensibility or death and so stop the struggles that might prove disastrous to the anemone. When the mouth is reached, the captive is pushed into the hollow interior, and the anemone shuts up into a reddish brown ball until its meal is digested, when it spreads its fatal beauties for another victim.

Another great family of flowering animals is that including the "sea cucumbers." These animals have long, flattened bodies of a dark color that ranges from brown to reddish purple, and their most active movement is a slow creeping along the bottom. At one end is the mouth surrounded by the petal-like tentacles that push into it the mud and sand on which the organism lives. The mud of the bottom is filled with tiny beings that really furnish the food, but it appears to subsist on the inorganic mud itself. The most curious thing about the "cucumber" is that it takes lodgers in a way. It has a large cavity within its body that is filled with water, and into this cavity a little fish called the fierasfer works its way, and then lives within the helpless host. It is not a parasite, for it leaves its lodging to seek food, but it merely lodges in the holothurian for shelter, as the power of stinging that sea cucumbers possess to a high degree renders them fairly safe from molestation. The little lodgers do not seem to do any harm to their landlords except when several take quarters in the same one, and then they may inflict fatal damage by overcrowding.

The whole class of coral-forming animals resemble plants so closely as to deceive all but skilled observers. Few sights in nature are more beautiful than the "coral gardens" in the West Indies, where the gorgeously colored vegetation is almost entirely animal in character. The sea bottom near Nassau is formed of white coral sand and the débris of broken-down shells, and covering this is water of such transparency that the boat seems to float in air. A plate of glass is let into the floor of the boat, and the reflection of the sunlight from the white sand below illuminates the scene so that its smallest detail is visible. The sheet of glittering white sand is broken by dark masses of coral rock from which stream broad sheets of "fan coral" that naturalists call gorgonias, brilliant in vivid reds, yellows and purples. The darker masses of rock are spangled with anemones that equal the tints of a tropical forest, while the waving plumes of the sea feathers and the fantastic shapes of the glass sponges add the charm of variety of form. Clumps of bright-hued sea weeds that bear little resemblance to the dirty, faded green ones common on our coasts, are the only representatives of real vegetation that greet the eye. All the rest is animal, but the eye is deceived by a mimicry of plant life so perfect as to make the efforts of our human players crude indeed. The vivid stars of richest crimson that look like blooms on the branches of the coral are really the ends of boring annelids, worms that cut into the stony mass and ensconce themselves in the trunks of growing coral.

The birds and butterflies of the upper world are replaced by fishes of curious forms and flashing colors. The common names of these give even those who have never seen them an idea of their appearance, but their beauties can be appreciated only when in their native element and amid their normal surroundings. Angel fishes, parrot fishes, butterfly fishes, and shoals of smaller ones float through the water with easy grace, or dart into shelter with a quickness that would elude the eye but for the silvery gleam of their bodies as the sunlight is flashed back from the glittering scales. It is hard to believe that the fishes that seem to browse among the coral trees do not actually bite off the tips as sheep would nibble twigs, and even so close an observer as Darwin thought that they did so, but they are seeking the crustaceans that feed on the coral madrepores, or, perhaps, the madrepores themselves.

In the sheltered tropical waters grow anemones that are larger and more beautiful than those in our harsher climate. Some of them are two feet or more in diameter, and from this they range to tiny forms that can be found only after careful search, but from the largest to the smallest, they have a charm that lures many an unfortunate being to its doom.

Zoology has revealed no organism more at variance with the popular conception of animals than the "sea lilies" or crinoids, and when seen for the first time it is difficult to believe that they are not near relatives of the stately queen of flowers, but in all but form they are animals belonging to the same family as does the starfish. The crinoids grow in clusters like the beds of tiger lilies, and from the bed a jointed stalk rises sometimes to a height of several feet before the "lily" is reached. Surmounting this stem is a disk that bears the mouth, as in the case of the anemones, but the tentacles are much longer and rise around the margins of the disk in such a manner as to simulate a lily with marvelous perfection. Unlike most of the anemones, the crinoids live in deep water, and some of them have been dredged up from the depths in which it seems impossible for such tender and delicate things to exist. They were among the earliest types of animal life on earth, and their fossils are very common. They are in such preservation that they were called "stone lilies" before their true nature was understood, and their origin was much discussed before the living crinoids were discovered.

However anomalous the idea of flowering animals may appear, it is not more so than is that of plants that set traps and devour the prey taken by them. Flesh-eating plants seem to violate the rules of nature, yet the violation is apparent rather than real, for many plants absorb animal matter as part of their food. In general this is taken in only after decomposition has rendered the tissues soluble, but there are some blood-thirsty plants that kill and eat small animals as ruthlessly as do beasts of prey.

Among these the little sun-dew is most widely known, for its fame was spread over the world by the work of Darwin, who gave an elaborate description of it in his "Insectivorous Plants." The leaves of the sun-dew are studded with little projections on whose summits are drops of a clear, sticky liquid that glistens in the sun, as does dew, and from this the name is derived. The liquid attracts insects, either by its appearance or its odor; but when the unfortunate visitor seeks to sip the tempting draught, the leaf begins to coil inward and form a cup from which escape is impossible. The liquor runs down into the hollow and collects into a pool, in which the insect is drowned before being digested.

In the neighborhood of Wilmington there grows the "North Carolina Fly-Catcher," a plant that Linnæus called "the miracle of nature." This plant has leaves divided into two lobes that sit at a little less than a right angle to one another, and are fringed with tiny spikes. The upper side of each lobe is covered with minute glands that secrete a purple fluid, and also has a number of sensitive filaments arranged in a triangle. If an insect touch these filaments, the lobes shut up like the leaves of a book, the two parts turning on the midrib as a hinge, and the intruder is captured. If it be very small, it can escape through the spaces between the interlocking spikes, but otherwise the leaf forms itself into a temporary stomach in which digestion proceeds. The glands that were dry before, begin to secrete an acid liquid of a purple color, containing an enzyme like pepsin, in which the soft parts of the victim are disintegrated, and as this proceeds the pressure is increased until all of the digestible matter is absorbed, when the leaf gradually opens and the dry husk is extruded. The leaf will close on a bit of glass or stone as readily as on a fly, but the fraud is quickly discovered, and the indigestible matter rejected. The leaf is then ready to close again, even before it is fully opened, whereas when digesting food material it stays closed for several days, and is very sluggish in shutting again. The most vigorous leaves seem to be able to digest only two or three times in a lifetime, and the botanist Lindsay fed some specimens with such quantities of meat that they died from indigestion.

In Portugal there is a plant known as the Drosophyllum lusitanicum among botanists, that is so efficient as a fly catcher that the country people hang up branches of it for this purpose. It secretes a gummy, sticky fluid that entangles insects and kills them.

The common bladderwort is a foe to many small animals. It captures great numbers of water bugs, and has been known to catch and kill small fishes. From time to time the attention of fish culturists is called to this plant as a foe, but it is not regarded as a serious one.

THE IRON AND STEEL INSTITUTE AT PARIS.

BY THE PARIS CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

Among the most interesting of the papers read before the recent meeting of the Iron and Steel Institute at Paris, was that of Mr. Ernest Lange, of Manchester, relating to a new method of producing high temperatures and its application in practice. This method has been first practically applied by M. Goldschmidt, of Essen, and depends upon the reducing action of aluminium. This metal has a great chemical activity, and its affinity for oxygen gives it a considerable reducing power. Its heat of combustion has been determined by Mr. Thomsen, who finds that 393·6 calories are disengaged by the union of an atom of the metal with oxygen and water; as a result of the reaction, aluminium oxide, Al_2O_3, and water are formed. M. Goldschmidt, of Essen, was the first to apply the principle on a large scale in metallurgical work and overcome the difficulties met with by previous experimenters. He found that to cause the reaction it was not necessary to heat the whole mixture of the metallic oxide to be reduced and aluminium powder to its igniting temperature, but it sufficed to cause the ignition in a single point, and then the reaction soon spread throughout the whole mass. In this way exterior heating was dispensed with, and thus all danger of explosion was avoided.

In the method used by Goldschmidt, the crucible in which the action takes place remains at first cold at the exterior, and only becomes heated up by conduction, this being an excellent condition for resisting the very high temperature of the reacting mass in the interior. To start the action, one point is strongly heated by placing at the surface a cartridge containing a small quantity of a mixture easily inflammable and capable of giving a high temperature; the aluminium is used either in powder or in grains. The crucibles used should be such that their material does not enter into the reaction; for these, magnesia is preferable. The metals reduced from their oxides are obtained in a very pure state without alloy of aluminium, provided the reaction starts with a slight excess of the oxide; they are quite free from carbon, which is an important point. Under these conditions M. Goldschmidt has been able to produce 220 pounds of pure chromium in 25 minutes; he uses a special furnace in the form of a crucible; a small quantity of the mixture is poured in and ignited, and when the action is finished the process is repeated. The surface crust of corundum is remelted at each addition, while the metal unites at the bottom in a single mass; it is estimated that a temperature of 3.000° C. is reached in the interior of the crucible. Mr. Lange considers that this method is also of considerable value in rail-soldering and repairing of steel castings. In these cases the oxide best adapted is the red oxide of iron, Fe_2O_3, and it is mixed with aluminium powder, using the following reaction: $Fe_2O_3 + Al_2 = Al_2O_3 + Fe_2$. This mixture may be regulated according to the degree of heat it is desired to use. For relatively low temperatures pure aluminium is not required, or in other cases the oxide of iron may be mixed with magnesia or carbonate of lime. For soldering purposes alone, the reduced iron need not be absolutely pure, but this latter condition is necessary for the repairing of castings. As concerns the soldering process, this method offers great advantages in the construction of electric railways, where the continuity for the return current though the rails must be assured. It permits of operating on the spot, and avoids the use of rail-bonds, without requiring the transportation of a heavy outfit.