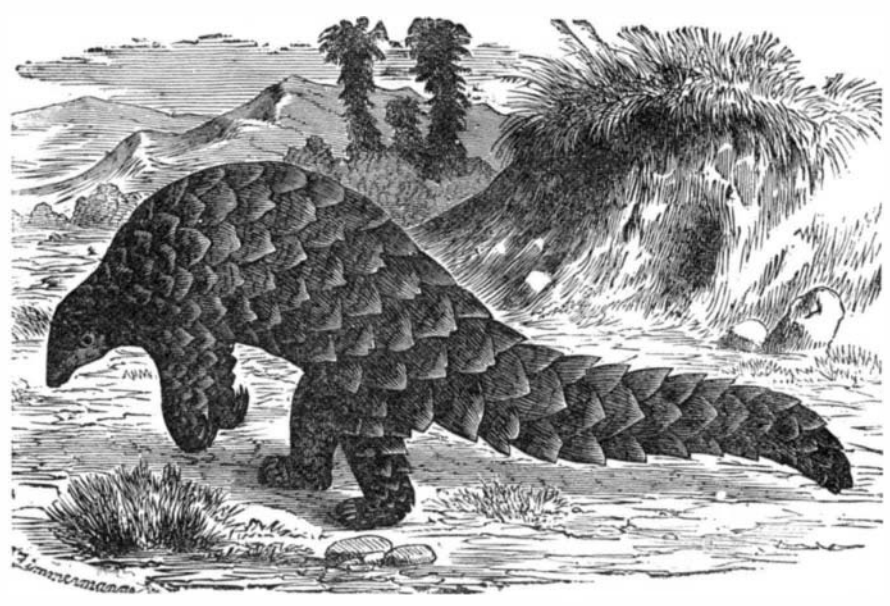
THE ANT-EATER FAMILY.

The ant-eater is a remarkable animal of the old genus *myrmecophaga*, and of the edentate or toothless order. The hind feet are plantigrade, and armed with large claws bent inward, so that the animal walks on the extreme edge of the foot. This arrangement is a wise provision of Nature for preserving the claws from damage, they being used for tearing down the ant hills and unearthing the insects on which the animal chiefly feeds. The South American variety is a hairy creature, sometimes called the ant bear (*myromecophaga jubata*); it is about four feet long, and has a bushy tail of two and a half feet more, and its hight at the shoulder is about three feet three inches. The tongue of the ant-eater is remarkable; it can be darted from the mouth to a length of eighteen inches, and is thus very effective in picking up its food, resembling in this respect the tongue of the chameleon.

We publish herewith an engraving of the scaly ant-eater, commonly found in Africa and Asia. This specimen is known as the pangolin, and its scaly covering is formidable, being hard enough to turn a musket ball. When it is alarmed, and cannot reach its hole in the ground, it rolls itself up like a ball, throwing up the sharp edges of its scales, and then the animals which usually attack it are glad to let it alone.

Sir Emerson Tennent, while in Ceylon, kept two of these creatures alive at one time, and says: "One was a gentle and affectionate creature, which, after wandering over the house in search of ants, would attract attention to its wants by climbing up my knee, and laying hold of my leg by its tail. It seized ants by extending its long, glutinous tongue along their track."

Still another kind is found in Africa, it is called the phatagin. In the hot countries where all these species have their habitat, the ants are very troublesome, and destroy much property, and animals that are capable of getting rid of them in such numbers are viewed by some eastern races with superstitious awe.



THE SCALY ANT-EATER.

A Human Analysis.

Dr. Lancaster, of London, recently analyzed a man, and presented the results of his investigation in palpable form to his audience during a late chemical lecture. The body operated upon weighed 158·4 lbs. The lecturer exhibited upon the platform 23·1 lbs. carbon, 2·2 lbs. lime, 22·3 ozs. phosphorus, and about 1 oz. each sodium, iron, potassium, magnesium, and silicon. He apologized for not exhibiting 5,595 cubic feet of oxygen, weighing 121 lbs., 105,900 cubic feet of hydrogen, weighing 15·4 lbs., and 52 cubic feet of nitrogen, likewise obtained from the body, on account of their great bulk. All of these elements combine into the following: 121 lbs. water, 16·5 lbs. gelatin, 132 lbs. fat, 8·8 lbs. fibrin and albumen, 7 7 lbs. phosphate of lime and other mineral substances.

Action of Sulphuric Acid on Lead and its Alloys.

Few metals are able to resist the action of hot oil of vitriol, lead being, of all the common metals, the least acted upon by this acid. The addition of some metals assists lead to withstand the attacks of sulphuric acid, while others render it a more easy victim. The careful experiments of A. Bauer, which were published recently in the *Berichte der Deutscher Chemischen Gesellschaft*, cannot fail to be of practical value to manufacturers and others.

Several alloys were prepared by fusing pure lead with other metals, the exact composition being determined by analysis. These alloys were rolled out into plates of equal thickness, and heated in a suitable apparatus with sulphuric acid of 66° B., the temperature at which a reaction took place being carefully observed. The apparatus consisted of a flask secured in position a little above the bottom of an air bath, the sides of which were formed by a glass cylinder. A thermometer, reaching down to the acid in the flask, showed its temperature. In every experiment an equal weight of alloy and an equal volume of acid were employed. The results were as follows:

1. Pure lead: A strip of pure lead weighing 3 grains was heated in 3½ cubic inches sulphuric acid of 66° B. At about 347° Fah., a considerable evolution of gas took place, which was stronger at 374° Fah. At 446° or 464° Fah., all the lead was at once converted into sulphate of lead, which dissolved in the sulphuric acid. At this sudden decomposition, sulphurous acid and hydrogen appeared, and sulphur separated.

2. Alloys of lead and bismuth: (*a*) With 10 per cent of bismuth. The action began at 302° Fah., and continued, slowly and quietly, up to 374° Fah., at which temperature all the metal was destroyed. (*b*) With 4 per cent of bismuth. The decomposition followed more rapidly than with the 10 per cent alloy, and was finished at 266° to 284° Fah. (*c*) With 0·73 per cent of bismuth. The decomposition followed, suddenly and completely, at 320° Fah.

3 Alloys of lead and antimony: (*a*) With 10 per cent of antimony. This alloy decomposed slowly and steadily; a strong action began at 374° Fah., and ended at 446° to 464° Fah. (*b*) With 5 per cent antimony. This alloy also dissolved slowly. A more violent action began at 356° to 374° Fah., and the end was at 428° to 437° Fah. (*c*) With 1 per cent antimony. Here too the decomposition is slow, but a considerable evolution of gas takes place at 482° Fah., and the action is ended at 536° Fah.

4. Alloy of lead and arsenic: Containing 10 per cent arsenic. This alloy acts very like the 10 per cent antimony alloy. The action is slower, and ends at 464° Fah.

5. Alloy of lead with 1 per cent copper: This acts very similarly to the 1 per cent antimony alloy; a strong reaction begins at 482° Fah., and all the metal is dissolved at 536° Fah.

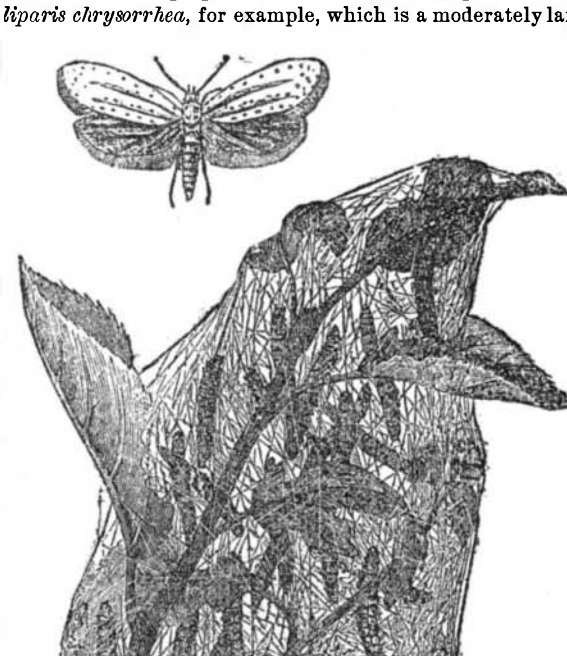
6. Alloys of lead and platinum: (*a*) With 10 per cent platinum. The decomposition is slow and incomplete, and ends at 536° Fah. (*b*) With 2 per cent of platinum. The decomposition is sudden and complete, between 500° and 536° Fah.

7. Alloy of lead and tin with 10 per cent tin: This alloy acts like pure lead; solution takes place suddenly at about 392° Fah.

These experiments show that the addition of a little antimony or copper renders the alloy more able to resist sulphuric acid, while bismuth has a decidedly injurious effect.

THE COBWEB APPLE MOTH.

The little moth represented in the accompanying engraving is very injurious to our apple trees. As is often the case, its size bears no proportion to its destructive powers. The *liparis chrysorrhea*, for example, which is a moderately large



bombyx, is generally thought a very bad inmate in an orchard, and on the continent its hurtful propensities are so well known, and the means of counteracting them so simple, that municipalities and powers have given it renown, by enacting decrees for its extermination and putting a price upon the heads of its members: and yet, destructive as it is, it is nothing to this tiny *yponomeuta*. The liparis strips the branch on which the brood has been established—nay, many branches may be wholly defoliated, but the whole tree is rarely entirely stripped, whereas the *yponomeuta* spares nothing; it invades the whole tree, and leaves it as bare as if fire or the locust had passed over it. One thing only it leaves behind it, as it were in charity or contempt, namely, a white veil wrapped round the tree, as if to conceal its nakedness. It looks like a forgotten skeleton enveloped in spiders' webs.

This is the work of the caterpillars. Hatched in the previous winter, they revive in the months of May and June, and the eggs from which they spring having been laid in the previous autumn in numbers, near each other, large families or societies speedily spin a commodious tent, represented in the engraving, in which they are sheltered from sun and rain. At first a number of leaves are inclosed in the web, and on these the young larvæ feed. These are soon consumed. The tent is then enlarged, and more leaves covered in. When all these are consumed, they flit to a new region, where they spin a new web. This, repeated by multitudes of families all over the tree, leaves it utterly consumed, and annihilates all chance of the smallest crop. In the month of July the larva passes into the chrysalis state in its web, the head being downwards. The perfect insect comes out in August. After coupling, the female lays her eggs in numbers in the bifurcation of the branches. The young larvæ are hatched in the month of September. They then shelter under a slight envelope of silk, when they pass the winter in a state of torpidity, out of which they awake in the month of May, to follow the course of life above indicated. This species feeds on the apple, the thorn, and sometimes on the service tree; rarely, if ever, on anything else. The larva, when young, at the beginning of May, is yellowish white, covered with small blackish points; the head and plate of the first segment are blackish brown. When it is adult, at the end of June, it is velvety gray, with two dorsal rows of deep black quadrangular spots. The head, the plate of the first segment, and the true legs are dull black. The perfect insect has the upper wings entirely pure white, without any tinge of leaden hue, and with about twenty-four small black spots. The lower wings are blackish. The figures are slightly enlarged. No satisfactory remedy has been found for this scourge. Scorching the nests with blazing torches and sweeping them away with stiff brooms have been suggested; but the suggestions are neither very practical nor efficient.—*The Garden.*

The Magnetization of Gas Spectra.

Some very curious experiments have recently been laid before the French Academy of Sciences by M. Chautard, relative to the influence of a powerful magnet upon the spectra of gases contained in Geissler tubes and illuminated by means of the electric current. In all simple bodies of the chlorine family, and in the gaseous or volatile compounds derived therefrom which thus far have been examined, the action of the magnet is immediate, and manifests itself, not merely by a change of color in the tube, but by an increased brilliancy of the spectral lines, which become doubled. The bodies thus far submitted to investigation, besides chlorine, which behave similarly include bromine, iodine, the chloride, bromide and fluoride of silicium, the fluoride of boron, hydrochloric acid, chloride of antimony and of bismuth, bichloride of mercury, and the protochloride and bichloride of tin.

The lights of sulphur and of selenium become extinguished the instant the magnet is excited, and the same is the case with that of the tubes containing chlorine, bromine, and iodine when the tension of the coil is suitable. The feeble brilliancy of the oxygen illumination is not sensibly modified, nor is that of carbon compounds, such as carbonic acid, carbonic oxide, etc. The fine bands of the nitrogen spectrum are not changed, except in the red and yellow portion. These colors become almost completely extinguished, or at least are replaced by a flat uniform tint, in which all traces of lines disappear. The lines in the more refrangible region remain intact.

The hydrogen lines keep sensibly their normal appearance, but by employing a sufficiently powerful magnet, at the moment of excitation a very brilliant yellow line appears, which is due to sodium, doubtless obtained from the surrounding glass. This line vanishes as if by magic when the current is interrupted, to reappear again, however, for some time, as often as the electric flow is established. Eventually it loses intensity, and it becomes necessary to allow the tube several minutes of repose before the line can again be caused to appear. It shows itself also in nitrogen tubes, and in those containing carbonic and hydrochloric acid.

The protochloride of tin, crystallized and dry, but bihydrated, offers remarkable phenomena of dissociation under the magnetic influence. Normally the spectrum is pale, and shows a few of the green chlorine lines; but as soon as the magnet is excited, two characteristic bands of hydrogen, the red and the blue, appear, which remain as long as the magnetization exists, and return with the same indefinitely. M. Chautard attributes this to the momentary separation of the elements of the water of the salt, due to the considerable resistance opposed to the passage of the induced current during the magnetization.

M. Chautard's investigations are still in progress, and doubtless further novel and interesting results remain to be adduced. The phenomena noted are remarkable, and will attract the close attention of chemists and physicists generally

AT Columbia, Tenn., recently, the boiler of a steam thresher suddenly exploded, killing three and wounding seven persons who were working the machine. It is stated that one piece of the boiler fell at a distance of three miles from the scene of the disaster; but this requires confirmation. The cause of the explosion was the usual one—care lessness.

© 1875 SCIENTIFIC AMERICAN, INC.