

**THE IBEX.**

Of the genus *Capra*, which includes several species, the ibex or steinbok is a familiar and excellent example.

This animal, an inhabitant of the Alps, is remarkable for the exceeding development of the horns, which are sometimes more than three feet in length, and of such extraordinary dimensions that they appear to a casual observer to be peculiarly unsuitable for an animal which traverses the craggy regions of Alpine precipices. Some writers say that these enormous horns are employed by their owners as "buffers," by which the force of a fall may be broken, and that the animal, when leaping from a great height, will alight on its horns, and by their elastic strength be guarded from the severity of a shock that would instantly kill any animal not so defended. This statement, however, is but little credited.

To hunt the ibex successfully is as hard a matter as hunting the chamois, for the ibex is to the full as wary and active an animal, and is sometimes apt to turn the tables on its pursuer, and assume an offensive deportment. Should the hunter approach too near the ibex, the animal will, as if suddenly urged by the reckless courage of despair, dash boldly forward at its foe, and strike him from the precipitous rock over which he is forced to pass. The difficulty of the chase is further increased by the fact that the ibex is a remarkably enduring animal, and is capable of abstaining from food or water for a considerable time.

It lives in little bands of five or ten in number, each troop being under the command of an old male, and preserving admirable order among themselves. Their sentinel is ever on the watch, and at the slightest suspicious sound, scent, or object the warning whistle is blown, and the whole troop make instantly for the highest attainable point. Their instinct always leads them upward, an inborn "excelsior" being woven into their very natures, and as soon as they perceive danger, they invariably begin to mount toward the line of perpetual snow. The young of this animal are produced in April, and in a few hours after their birth they are strong enough to follow their parent.

The color of the ibex is a reddish brown in summer, and gray-brown in winter; a dark stripe passes along the spine and over the face, and the abdomen and interior faces of the limbs are washed with whitish-gray. The horns are covered from base to point with strongly marked transverse ridges, the number of which is variable, and is thought by some persons to denote the age of the animal. In the female the horns are not nearly so large nor so heavily ridged as in the male. The ibex is also known under the name of bouquetin.

**Preservative of the Dead.**

The United States Consul-General at Berlin, Mr. Kreismann, has communicated to the Department of State a new process patented in Germany for preservation of the dead. The liquid used is prepared as follows: In 3,000 grammes of boiling water are dissolved 100 grammes of alum, 25 grammes of cooking salt, 12 grammes of saltpeter, 60 grammes of potash, and 10 grammes of arsenic acid. When cool it is filtered. To 10 liters of this liquid 4 liters of glycerine and 1 liter of methylic alcohol are added. The process of embalming is by saturating and impregnating the bodies with it. From 1½ to 5 liters of the liquid are used for a body.

**Volcanic Products at the Bottom of the Pacific.**

The Abbé Renard and Mr. J. Murray communicated to the Geological Section of the British Association, at Sheffield, the results of an examination of the materials brought up by the Challenger's instruments from the bottom of the central Pacific. The area from which the materials submitted to the Abbé Renard were derived extends from the Sandwich Islands to 30° S. lat., having the Low Archipelago approximately in its center. Volcanic matter was found to play an important part in the formation of the bottom, being present in the form of lapilli and ashes distributed in great abundance in the "red clay," of which we have heard

so much. The lapilli nearly all belong to the basaltic type, passing from felspathic basalt to allied rocks, in which the vitreous base acquires greater and greater development, until it almost entirely displaces the crystalline constituents of the basalt, when the fragments become mere glassy rocks of the basic series, generally containing some crystals of peridote, innumerable crystallites, the latter sometimes grouped in opaque granules, sometimes arranged regularly around the peridote microlites. From the forms of these volcanic fragments, which are often coated with manganese, their association with volcanic ash, and their lithological constitution, they cannot be derived from submarine flows of lava. They are rather incoherent volcanic products, or lapilli, the accumulations of which in the Pacific form a series of submarine tuffs.

One of the most remarkable facts, brought to light by these soundings in the Pacific, is the large share taken in the formation of these sedimentary deposits by palagonites, perfectly identical in lithological characters with those of Sicily, Iceland, and the Galapagos islands. Many are in

which they are developed is easily understood if we bear in mind the lithological nature of the basic tuffs and of their products of decomposition.—*Nature*.

**NATURAL HISTORY NOTES.**

**THE BEHEADING OF FLIES BY A WESTERN PLANT.**—In the *Bulletin de la Société Botanique de France* (vol. xxiv.), says Professor Asa Gray, there is an account by M. J. Poisson of his observations upon *Mentzelia ornata* as cultivated in the Jardin des Plantes, Paris, and the very singular mode in which it causes the destruction of flies. It is so curious that the essential points of M. Poisson's communication are here recapitulated, in the hope that observations may be made in this country, either by the few who are able to cultivate this ornamental plant with success, or by those who can examine it in its native stations. It is well known that the roughness of this and some related *Loasaceæ* is owing to the stiff bristles of the surface being provided with an armature, at certain points along their length, of retrorse barbs. There

are three or four whorls of these barbs, and four or five barbs to each whorl, on the larger bristles; in the smaller there is only a terminal whorl of barbs, in the manner of a glochidiate bristle. Mixed with these harpoon-like bristles are some soft ones, tipped with a capitate gland, which secrete a viscid matter attractive to insects. It appears that flies so attracted thrust in their proboscis between the thickly-set glochidiate bristles to feed upon the secretion of the glands between and below. The retrorse barbs interpose no obstacle to this; but when the proboscis is withdrawn, its dilated and cushion-like tip catches in the barbs, and holds all fast. The harder the backward pull, the firmer and more extensive the attachment to the sharp barbs. The wounded and impaled organ becomes congested and swollen, and the insect is seldom able to disengage it. Especially is this the case with the larger flies. Some perish by exhaustion; but more of them, passing round and round in a circle, and in one and the same direction, come to an end by twisting off their heads. Insects too small to be impaled on the barbs are held fast by the viscid secretions of the glands, and likewise perish. In these respects the arrangement comes under the head of those recently illustrated by Kerner, for the exclusion of unwelcome guests from the blossoms. And this may be extended to the flies also, which might reach the blossom on the wing, but are attracted rather to the glands beneath, to their own destruction. Professor Gray requests those who have good opportunities of obtaining *Mentzelia ornata*, and its much more common relative, *M. nuda*, both of which occur in the Western prairies and plains, to investigate the matter and ascertain whether this charge of cruel behavior is well founded.

**CACTUS SPINES.**—The spines must, says Moseley in his "Notes of a Naturalist," be a most efficient

protection to the cactus from being devoured by large animals. "I have often noticed that if one approaches one's hand slowly toward some of the forms with closely set long spines, doing it with especial care to try and touch the end of one of the spines lightly without getting pricked, one's hand always does receive a sharp prick before such is expected, the distance having been miscalculated. There seems to be a special arrangement in the color of the spines in some cases, possibly intended directly to bring about an illusion, and cause animals likely to injure the plant to get pricked severely before they expect it, and thus to teach them to shun the plant. While the greater length of the spines next the surface of the plant is white, the tips are dark colored or black. The black tips are almost invisible as viewed at a good many angles against the general mass as a background. The spines look as if they ended where the white coloring ends, and the hand is advanced as if the prickles began there, and is pricked suddenly by some unseen black tip. The experiment is easily tried in any cactus house at home."

**HYBRID SHAD.**—Mr. Seth Green has recently called attention to the fact that it has been customary for the last four



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fact glasses of the basic series, either consisting of sideromelane, or decomposed into a red resinoid substance. The small lapilli of two or three inches in diameter are cemented by zeolites, showing the crystalline forms of christianite. The presence of these readily alterable basic glasses at once reveals the source of the clayey matter with which they are associated, as wherever rocks of this type occur their decomposition into clay is observable.

Among the minerals present in the volcanic ash are rhombic tabular crystals of plagioclase, augite, magnetite, and a little sanidine or hornblende. It is singular that quartz grains are practically absent, in striking contrast to coast deposits. This fact, however, is not so unexpected as the formation of zeolites in the free state. Minute fibrous radiated spherules are formed in the mud, possessing the crystallographic characters of christianite.

Besides these zeolitic spherules, other crystals of the same kind occur in the form of minute prisms, and in such prodigious numbers that they make up about one third of the red clay. These and the zeolitic spherules are regarded by the authors as belonging to one mineral species, and they remark that the formation of these and of the red clay in

years at the shad hatching works on the Hudson River, whenever an opportunity offered, to impregnate the spawn of the shad with the milt of the white bass. He says that these eggs have hatched out in quite as large a percentage as those impregnated with the shad milt. The young fish look very much like small shad, but their actions are so entirely different that they are readily distinguishable while in the hatching boxes. The attention of fishermen and others is particularly called to the fact that such hybrids now exist in the Hudson, and they are requested if any such be caught to make known the fact through the papers or otherwise, describing as particularly as possible the appearance, characteristics, etc., of the strange fish.

### Correspondence.

#### EDISON'S ELECTRICAL GENERATOR.

To the Editor of the Scientific American:

The letter of Mr. Upton, on page 337, is far from being satisfactory, at least to myself, for it tends to frustrate the realization of the plans I had suggested of relieving Mr. Edison from the appearance of having put forth a preposterous claim for his electric generator. It has almost brought me into the thick of a controversy; I barely escape and reserve my valor for another day. I protest that up to this time I do not know that there is any disagreement between Mr. Edison and myself. Mr. Upton is indeed Mr. Edison's assistant, and his letter purports to be authorized, and yet I cannot find anywhere irrefragable proof that Mr. Edison is the author of the preposterous claim, or that he ever indorsed it. I believe it is best, indeed, as I did in my article on page 305, to assume, until its falsity is proved, that Mr. Edison in the matter of that preposterous claim, or anything else, has not treated with indignity the revered memories of Ohm, Faraday, and the other fathers of electricity. Mr. Edison, like myself, appears to love peace and quietness, and perhaps the guilty author of that preposterous claim will never be discovered and punished. The disagreement which so far is developed is between Mr. Upton and myself only, and it will not long continue if he will take my advice.

The matter in Mr. Upton's letter which is offered as especially pertinent to the preposterous claim is comprised in the two following sentences:

1., "The writer of the article (on page 242) simply stated that the machine was so constructed that when used at its normal capacity the exterior resistance shall be nine times as great as the internal, so that ninety per cent of the power of the current could be used outside."

2. "Yet all that was claimed in the article (page 242) was perfectly true, and has been carefully verified."

I have not been able to satisfy myself as to what are the intent and meaning of sentence 1. I cannot find out what "normal capacity" is. I cannot find out what the thing is which was simply stated; why did not Mr. Upton state it simply? Among various theories of the intent of sentence 1 which I have worked out, the most plausible is, that the sentence is a device like those terrible engines which Knickerbocker, in his history of New York, relates were employed by the ponderous Dutch warriors. This theory derives confirmation from the fact, which appears on page 308, that Mr. Upton found it a fair thing to fire, without warning, at short range, and point blank, hot shot of Calculus (!) right into a gentleman by the name of Weston.

But sentence 2 is direct, explicit, and emphatic. It is so admirable in its way that I quote it again: "Yet all that was claimed in the article was perfectly true, and was carefully verified." Now, as nothing was claimed (on 242) but what is covered by the preposterous claim, this latter is signed, sealed, and indorsed; it is represented as having been verified; it is reasserted strenuously. Did Mr. Upton pen that sentence, with the demonstration on page 305 before his eyes?

I reproduce, from page 242, the preposterous claim: "Mr. Edison claims that he realizes ninety per cent of the power applied to this machine in effective external current," and thereupon soon follows the explanation that the great economy is due to the employing of a resistance ratio of 1:9. For the demonstration of the fallacy of this I refer to page 305.

I might stop here, far I have said all that is required concerning the matter of the preposterous claim. Mr. Upton introduces several other and extraneous things which are calculated, like that sentence 1, to befog and lead astray the hasty reader, and I shall therefore briefly notice them. The larger part of the letter is devoted to remarks which are aimed more or less directly at myself personally. The general effect of these is substantially that of the trite retort, you're another; but I meet them in detail by pointing out that a part are intended to show that I had overlooked something important, and the rest that I use technical terms ignorantly and recklessly.

1. After a very ingenious prelude, in which I am made to take a rather funny part, the following climax is reached: "It seems never to have occurred to the doctor that it is in the power of the maker of the machine to exert this 'moral suasion' on the wire covering the armature, so that it shall be more effective and redouble its exertion when greater resistance is offered for it to overcome." Mr. Upton is correct; it really never did occur to me. But feeling that such a confession, on account of its brevity, is rather weak, I append the remarks of one whose opinions are worth their weight in diamonds, and are the delight of the world: "If so be ye overhaul yer masheen, tack on yer armycheer a leetle more

wire, and make them irons, which ye call magnets, a leetle heftier, why then yer masheen will be bigger; and howbeit ye do these things, why ye'll have a bigger masheen. Bigger, did I say? No! Why? For the bearings of the observation is in the application on it." This is perhaps one of Bunsby's greatest efforts.

2. Mr. Upton neatly gets round to the remark that I deliberately state that current and foot pounds are the same, that energy is directly proportional to the current, etc., and he corrects and instructs me by remarking that "foot pounds are always measured by the square of the current," etc. Moreover, he says: "Dr. Seeley's distinction of outside from inside current seems to me ridiculous." Mr. Upton, no doubt, made himself quilty merry at the discovery of all these blunders of mine. Now I reply: Mr. Upton would not have discovered those blunders unless he had been looking for them; the wish is father to the thought. I do not think anybody else has found them, or is likely to find them. When we are obliged to write in the telegraphic style, as we are when limited as to time and space, we spontaneously take up abbreviated expressions which hypercritics might object to. Thus we may use the letter C for current or strength of current or energy of current, and no one but the hypercritics will misunderstand or complain unless some positive ambiguity results. Life is too short to write with a view of satisfying the hypercritics. I might quote many precedents for the expressions I used, but I content myself with a single one, for the reason that it is from an authority which, I am sure, Mr. Upton greatly respects; the authority, please understand, is not Mr. Edison: possibly it is Mr. Upton himself. If Mr. Upton will turn to page 242 he will find thereon the preposterous claim as originally propounded, and he will observe that the last two words are "external current." How is it now? Will Mr. Upton ever again say, "the distinction of outside from inside current seems to me ridiculous?"

After finishing my case, Mr. Upton goes on: "In conclusion, I may state that the methods which are employed for testing Mr. Edison's machines were fully described in a paper read by me (in August) at the Saratoga meeting of the American Association. At that time (in August), as now, full results were withheld until Mr. Edison was fully satisfied with the performance of the machine." I find in this pretty plain evidence that Mr. Edison did not—and this I have contended for from the first—put forth the preposterous claim. He had full tests in August as well as on October 11th, and of course he knew that he did not realize that 90 per cent; if he had realized it, he would have been fully satisfied with the performance of his machine, for his machine would be the greatest invention of all time.

Mr. Upton concludes by mentioning that Mr. Edison hopes soon to have a machine with a resistance ratio of 1:20. I trust this is not quite true. It would be almost a public calamity if Mr. Edison should employ his great talent on such a puerility. I quote again: "His machine is so made that it would be impossible to use it with the same resistance outside as inside, as it would heat the wire on the armature so as almost to burn it, by carrying a current so much in excess of that for which it was intended." The truth of this must be evident to any one who is a tolerable expert on machines; but I quote it as further evidence that Mr. Edison is not the author of the preposterous claim, and to raise the query whether we cannot relieve Mr. Upton also from suspicion.

A few weeks since (suppose) the startling announcement was made in the papers that X, a dear and distinguished friend of mine, had lifted himself over a tall fence by pulling on his boot straps. Many respectable people, influenced mainly by their exalted and often proved faith in the ability of X, accepted the announcement as true; for my friend was an eminent authority and exceedingly expert in the matters relating to the alleged achievement. The hopeful people at once began speculations on the applications of X's discovery to rapid transit and other great projects. The larger part of the community, however, remembering something of the little lessons in natural philosophy of their school days, denied the claims set up for X, and they scoffed at him. At this juncture it seemed to me a proper thing and a duty towards a friend and to the public to make an explanation. I said that the feat proclaimed was really an impossibility, that it was a contradiction of the law of action and reaction; that the pulling up on the boot strap would be precisely balanced by the pressing down of the feet in the boots, etc.; that my friend was of too good sense to claim impossible performances; that the announcement was an exaggeration, or came from a wicked partner, etc. My explanation was calculated to pacify the scoffers and to make all lovely again. My friend had no call to say anything, unless to indorse my explanation or to turn the whole affair into mild but pleasing entertainment by relating how the announcement originated in a little badinage of his, in which he proposed to lift himself over the fence, by pulling on the boot straps of his carriage after slinging them over a pulley, etc. But the affair is going to terminate differently and sadly. For a gentleman by the name of Z, who is an assistant (some say a partner) of X, has written a letter to the public which purports to be authorized by X, in which the original claim is reasserted and enlarged. Mr. Z says: 'Spring, at its normal capacity, is the pleasantest season of the year. X never denied Newton's laws. Yet all that was claimed in the papers was perfectly true, and has been carefully verified. X has positively lifted himself over a fence ten feet high, and it may be mentioned that he hopes to lift himself over a fence 20 feet high. There are doors in the

fence, but they have patent locks on them. (What does this mean?) This S isn't much of a doctor, and I wouldn't trust him with a sick cat. He spells Jerusalem with a G, and his name is mentioned in connection with a neighbor's hen roost." This letter of Z's is a great trouble to us, but I protest and persist that X is innocent. No one can foretell what is to come out of all this embarrassment.

But all this is supposition. Perhaps it isn't apropos of anything. "The bearings of an observation is in the applications on it."

CHARLES A. SEELEY.

#### A Note from Mr. Edison.—The Hughes Microphone and the Blake Transmitter.

To the Editor of the Scientific American:

In reference to the communication from T. D. Lockwood, which appeared in the SCIENTIFIC AMERICAN (No. 21), November 22, 1879, regarding the carbon telephone, I wish to say that his statement that the scientific men of Europe have supported the claim of Hughes that the microphonic action is different from the carbon telephone, is absolutely false, and as a fact just the contrary is the case. Also that the Patent Office has declared that the Blake transmitter filed in the Patent Office in 1879 infringes several of my patents filed in 1877. In fact there is not the slightest difference between the carbon transmitter and the so-called Blake transmitter, except in size of parts and delicacy of adjustment.

T. A. EDISON.

Menlo Park, N. J., November, 1879.

#### CROSS-BREEDING AMONG FISH.

Mr. Robert B. Roosevelt, so well known in connection with fish breeding, is responsible for some surprising assertions with regard to the inter-crossing of distinct species of fish. Some two years ago the eggs of a shad were placed in a pan of fresh water which could not have contained any milt of the male shad. This done, the eggs were mixed with the milt of a striped bass and they were immediately fertilized. They were then placed in the shad-hatching boxes, and fully 10,000 young cross-breeds were the result. They were turned into the river at the proper time, and it is not yet time for them to return, if they follow the customs of their mother.

That the hybrids are likely to thrive and breed is thought probable after the perfect success that has followed the crossing of the California salmon and the common brook trout. Mr. Roosevelt says: "We have crossed fifteen or twenty different breeds, and all successfully, and I can assure you that the result is a strong argument in favor of Darwinism, for it shows that all fish may possibly have grown out of one or two varieties. This would account for what is called the 'land-locked salmon' which is found in lakes having no communication with the sea. The object of this crossing and breeding is to improve the fish, just as they cross neat cattle and horses, and even fruits and flowers. The result will be to make fish food plenty, and to add a large number of 'queer fish' to the number already in existence."

#### THE INTERNATIONAL DAIRY FAIR.

The second annual International Dairy Fair in this city, to be opened in the American Institute building, December 8, promises to be the largest and finest exhibition of the kind ever held in this country. Nearly three thousand entries have already been made by intending exhibitors, and ten thousand dollars will be given as premiums. It is expected that at least 300 specimens of fine cattle will be exhibited, representing the most celebrated herds in the country. Especial attention will be given to this department of the fair. In addition to many novelties there is promised an elaborate comparison of the methods of butter and cheese manufacture as employed a hundred years ago and to-day in our best factories.

#### STEAM TOWING ON THE ERIE CANAL.

The first through tow on the Erie Canal from Buffalo to Rochester, by the steam cable towing system, arrived at the latter city, November 18. The tow consisted of five canal boats, carrying 1,200 tons of grain. The distance, 96 miles, was covered in 39 hours, a saving of 23 hours as compared with horse power. It is expected that the cable system will be completed the entire distance from Buffalo to Troy, 345 miles, shortly after the reopening of navigation in the spring. The existing canal boats will be used without alteration, and the boats will yield a larger revenue owing to the saving of time on each trip. The traffic of the canal this year has been unusually great, and it is expected that the new system will largely increase its capacity.

#### New Military Projectile.

Experiments have recently been carried on at Grenoble to test the efficacy of a new apparatus, made by M. Lamarre. The invention consists of balls to be projected by guns of a fortress for the purpose of throwing a strong light on the enemy's position during the night; the principal object being to prevent the digging of trenches or the performance of other military operations. Shortly after leaving the cannon, the Lamarre fire ball discharges a light sufficiently bright, and lasts long enough, to enable guns to be pointed at the works. The projectile is, moreover, provided with a grenade, which explodes after a certain time, and is designed to keep the enemy's troops away and prevent them from putting out the unwelcome light.