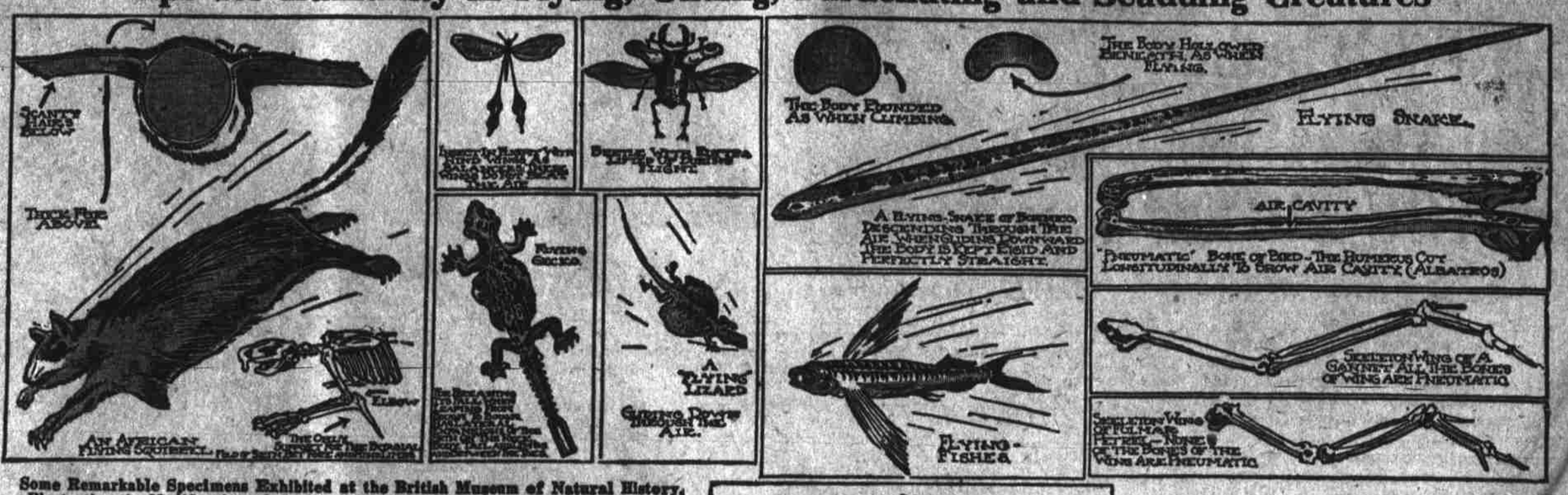
# New Things Not Found in Any Books

## How SNAKES And LIZARDS Learned to FLY Ages Before Man

### Tips for Humanity in Flying, Gliding, Parachuting and Scudding Creatures




Some Remarkable Specimens Exhibited at the British Museum of Natural History, Illustrating the Modification of the Structure of Flying Animals.

THE future of aviation may depend upon what science may learn from the observation of the flight of snakes and lizards. It is now believed that these flying reptiles may furnish a better object lesson for human birds to follow than the birds and insects which have hitherto been their principal models.

The Wright brothers owe their success in aviation almost exclusively to the study they made of birds and insects in flight, but it is now suggested that their success might have been greater had they pursued their investigation into nature's methods as revealed in the flight of reptiles and other animals other than birds and insects.

For the benefit of those who are seeking to improve upon our present methods of aviation, the British Museum of Natural History has placed on exhibition a number of valuable specimens illustrating the modification of the structure of animals in relation to flight. Some of the more remarkable of these exhibits are illustrated on this page.

In all the human attempts at aviation that have met with any degree of success the part of the apparatus that sustains the weight in the air (planes, or gasbag, as the case may be) is distinct from the driving apparatus (propeller and its engine), but a study of the specimen displayed at this novel exhibition shows that in flying animals the energy is generated by the contraction of muscles connected with the wings, and that the latter, by a regular beating or flapping action, both support the body in the air and force the body through it.

The exhibition is not limited to animals that can truly fly, but includes also examples of animals which move through the air by scudding, gliding or parachuting, without expending energy from the time when they leap off to the time when they alight, such as the so-called flying squirrels, flying phalangers, etc.

One of the interesting exhibits is that of a curious beetle with large elytra (the wingsheaths which form the superior wings in beetles and serve to cover and protect the true wings) which act as "planes" while the wings supply the driving power. The edges of the elytra are produced into flat leaf-like expansions, so that the elytra as a whole are larger than the wings. The wings fold up beneath the middle part of the elytra, not under the lateral plates.

But much more interesting are the various specimens of flying snake from Borneo from which aviators might perhaps be able to learn a lot. When gliding downward the body is kept rigid and perfectly straight. How the snake shapes its body when flying is illustrated by the cross section.

The flying gecko is another interesting exhibit. For breaking its fall when leaping from bough to bough, this animal has lateral expansions of the skin on the neck, body, tail and limbs and between the toes.

The "flying lizard" is displayed in various positions. This early ancestor of man is able to glide through the air in perfect safety.


Another interesting exhibit is that of the African flying squirrel. These animals glide rather than fly, but they might teach aviators a whole lot. The skin-fold, which connects the fore and hind limbs does not extend along the tail. These squirrels in flight resemble the true flying squirrels.

The exhibition includes many speciments of bats, the only mammal that can really fly and various types of flying fish. There is a South American fresh water fish which darts out of the water and into the air in a manner not unlike that in which the hydroplane operates.

For comparative study, there is shown the skeletons of many of the animals exhibited. The structure of the bones of flying animals has always been considered a matter of considerable importance for the aviator to study. Most Birds have "hollow" or pneumatic bones, but this is not true of other flying animals.

A restoration of the dimorphodon macronyx, an extinct flying reptile, which is shown at this exhibition, gives a very clear idea of how man's earliest flying ancestors looked, and there are a lot of restorations of extinct birds which shed new light on nature's methods.

The exhibition is interesting because it brings out very clearly the fact that if man ever learns to fly he will only be repeating what his ancestors did millions of years before him.

## Clean Chimneys with Potato Peel

SAVE the peelings of the potatoes you use for food. When the stove does not draw well place a quantity of these potato skins in the fire and their burning will clean up the soot and clear out the flue to such an extent it will not seem like the same chimney.

They do not need to be dry. Damp peelings just cut from potatoes will burn quite readily where there is considerable fire, and it is astonishing how quickly they will do the desired work.

Potato skins will dry easily if spread out in a warm place, and these make excellent kindling to be used in recruiting a sluggish fire or in starting one with paper. It is no difficult matter to start a fire without wood when dry potato skins are used with a little paper. The burning of the peelings clears out the fire, and no difficulty is experienced that day from the flue not drawing or the stove not acting satisfactorily.

These peelings are first class for clearing a furnace when slow fires have caused the place to become clogged up with soot.

Flues of boilers can be cleaned with perfect safety with potato skins, and little potatoes are useful where the fire is hot and the boiler flues are clogged, as the small potatoes will burn quickly, producing a condition that clears the place of anything that may be detrimental to a good draught.

In cases of sickness, or at times when a room becomes foul, it may be made much beter if a very little piece of potato skin is burned in the room. It is always best to have a window or door open when this is done, so there will be an opportunity for the impurity to get away. The air in rooms so treated is much purer.

## YOU MIGHT TRY...

### To Remove Paint Spots.

MIX equal parts of turpentine and ammonia and apply the solution to the spots with a piece of cloth the same color as the garment. Rub gently with the nap until the paint is removed, then sponge with warm water and a little soap.

### Whitening the Hands.

ALWAYS keep half a lemon in readiness to rub on the hands after peeling vegetables or fruit. This removes stains and keeps the hands white and soft.

### For Patent Leather Shoes.

TO lengthen the life of patent leather shoes, the dirt should always be removed with a damp sponge. Then carefully dry, apply a little vaseline and polish with a soft cloth.

### To Harden Bristles.

WHEN the bristles of your hair brush become soft wash the brush in hot water to which has been added a spoonful of ammonia. Then dissolve a large lump of salt in cold water, dip the brush in this several times, and let it dry in the open air.

## The Useful End of OLD TIN CANS

IN every vacant lot in a city and all over the great dumping places wherever holes and hollows are being filled in, you may count anywhere from half a dozen to half a thousand old tin cans. It is very seldom these are buried, for the ever busy rag pickers or junk dealers gather them up and pack them away in barrels until they have a carload or so, when they ship them away.

There are several concerns that buy these old tin cans, regardless of shape or size or condition. The battered tin can, tho can that had been run over by a train or dented with a workman's pick is just as valuable to these concerns as the bright new can undented.

All these old cans are dumped into a great furnace where the heat first melts off the tin. Although it should be remembered that a "tin" can is really an iron can, there is a thin coating of tin over it and tin is an exceedingly valuable metal. The tin, melting much sooner than the iron, runs down through the mass and is saved by moulding into blocks when it is as good as ever for recoating more cans. It may be the bright tin on your can of tomatoes or corn has been used a dozen or a hundred times previously on other cans.

After the tin runs off, the sheet iron of which the cans are made melts, and this is run off into ingots, or pigs, and sold for the cheaper quality of iron. It is used in making window weights, cheap cast iron toys and such things. Nothing is really lost except perhaps the labels which are burned off in the furnace. It is said the iron from the cans just about pays for running the furnaces, leaving the tin thus secured as the profit for the enterprise.

## GRADUATION Exercises Make ANARCHISTS

THE close relationship between the excessive egoism of the homicidal anarchist and the increasing egoism of children in American schools—public and private—has led Professor Browning, a well-known New York nervous specialist, to point out some of the dangers due to lack of proper teaching. Strikingly he points out that the child's desire to be "the whole thing" should be curbed and held in proper check, especially under the peculiar conditions of liberty that American life allows, and draws attention to the "elaborate dressy graduating exercises of every school at the present day," declaring that these "accelerate this vain egotistical paranoid bent."

From almost every corner of the compass there has been raised a chorus of objections to the foolish graduation display in the schools, aping the sufficiently unnecessary college graduation ceremonies. In the latter case, it is true, there is more excuse, since such graduation ceremonies are usually attended with the granting of honorary degrees to some man or woman whose fame is so great that the nation delights to honor such a one. Besides which, the college graduate—though often foolish enough—is of maturer age than the school child and is supposed to have sufficient intellectual development to be able to esteem the "dressing up" of his graduation at its proper valuation.

The unnecessarily elaborate performance of the school, however, has been regarded heretofore as foolish rather than as dangerous. But Dr. Browning points out that the child in its earlier years is wholly concerned with itself and its own interests, and that one of the chief needs of education is to give the child a proper regard for others. Anarchy is truly an exaggeration of the liberty and license of the individual, and the graduation exercises are often of a kind which seems apt to cause this very exaggeration. This is especially unfortunate, moreover, for it comes at an age when impressions are peculiarly vivid, and because it is the last impression many children receive in their educational life.

Of recent years there has been a movement to restrain this sort of thing because of the vulgarity of the display and the undemocratic character of the whole idea. It is significant that such a movement should have needed to be thrust upon the educators of the country rather than have originated from them. Costly commencements are not necessary, they serve no place in the educational scheme and they pander to an American weakness, namely, the valuation of everything on a money basis. This spirit should be checked by the schools, not aggrandized. And when it can so convincingly be shown that the feeding of the vanity of children in this way is destructive to their loyalty as citizens and suggestive of individual lawlessness, a strong case is made out against the "fussy" exercises. It will be as necessary to demand a "safe and sane" graduation as it has been a "safe and sane" Fourth of July.

## You Can't Be STRONG-ARMED Without STRONG JAWS

By Dr. LEONARD K. HIRSHBERG, A.M., M.D., Johns Hopkins.

IN the primeval days, when the present and before the present memories of man runneth not to the contrary, of the Pleistocene man, the anthropoid and homoeimian precursors, if not ancestors, the question of pabulum varied according to the progress of the animal kingdom toward the superman. More and more steadily it approached the much coveted animal victuals, consisting of insects, grubs, reptiles, eggs, birds and smaller game.

Gradually flesh-eating replaced the non-carniverous diet, and soon hunting and fishing vied with the tilled soil and the vineyards. Then came the domestication of the hunted beast and the nomad tribes that trained them. Then the meagre output of barren lands remained no longer a bar to the forward rush of the human tribe. Stony ground could not deter them from living. Finally life was really made worth while by the inventor of cooking. The introduction of cooking, like all new inventions, even of the present day, led at once to an over-consumption of the thing thus placed enticingly within the reach of all. Man soon and since then began eating himself into Bright's disease, cirrhosis of the liver, heart ailments, high blood pressure, arteria sclerosis, cumbersome rotundity and obese embonpoint.

Like the ebb and flow of the tide, mankind's ability to digest coarse and acrid victuals rose and fell with his habits, his indoor or outdoor life, his consumption of raw or cooked foods. Up to the origin of cooking, the muscles of the whole body, not to speak only of those in the mouth, throat and head, were aggressive, much used, and, you might say, in training. With the luxurious invention of cooking there was less and less call for muscular exertion upon the part of the muscular tissue. All of the mouth muscles concerned in the busy attack upon raw foods fell into innocuous desuetude. They became coddled, spoiled, pampered, almost entirely unused.

At the same time the saliva, the juices of the mouth that act as solvents upon vigorously chewed pabulum, became much reduced in power. With disastrous facility, pap and soups slipped into the stomach, and the human tissues started upon their toboggan of fatty degeneration and waste. The digestive powers became less and less able to cope with the coarser sorts of food, and the jaws, teeth and muscles shrank correspondingly in size, strength and usefulness.

Nowadays most people are accustomed to bolt their food often, and frequently swallow large lumps of wholly unchewed food. It is, however, very easy to train a child to properly masticate its diet. The mouth muscles once habituated by correct physical exercises to grind up all that passes between them acquire such a firm reflex that the moment a bit of food approaches them there is not a chance in the world of it ever passing their threshold.

One of the most important functions of the physical culturist, the gymnast and other experts of the new muscularity, is to train the muscles of the young children and older

The Muscles That Chew Your Food

The Splendid Chewing Muscles of the American Indian.

The Typical Face of the Athlete, Showing the Strong Jaws.

grown-ups as soon as they have teeth to completely utilize the muscles of their mouths and jaws.

The time has forever gone by when men will merely masticate their victuals according to some epidemic Fletcherizing theory. They needs must have something more than a beautiful hypothesis or idea. True enough, Fletcher's theory made men use their muscles, and hence, independent of the poetic aspect of his scheme, the practise was according to Hoyle. But it is far better to have men know the truth, to wit, that it is not so much the counting of forty, sixty or hundreds before swallowing as it is to cultivate the physical endurance and therefore the adaptability of the muscles of the mouth, just as you do your biceps, your tennis arm or your other muscles of peculiar skill.

It is unnecessary to say at this late day and date that the musical regularity of muscular contractions add zest and activity to the flow of blood throughout the whole of your tissues. Whether it be from dancing, tennis playing, swimming, rowing, walking, or the excellent exercises of physical training classes, or from the muscles of mastication, the tonic and stimulating effects upon your whole body is certain.

The muscles concerned in chewing your food are far more massive than is usually understood. Indeed, it is not too much to say that a man who is able only to vigorously manipulate his muscles of mastication and does so will achieve the same improvement in his general health as such an athlete as a baseball player or a pedestrian. Even the habit of chewing gum, a modern custom that calls down anathemas and social ostracism, is far better than the prevalent guzzling of predigested, soft, fluid and soupy meals.

Those who from childhood's happy hour have been accustomed to properly chew their meals will have sound muscles all over the body; their eyes will have a noble color; their cheeks will be filled even despite their ages with the bloom of youth; teeth, jaws and mouth will be shapely and attractive, and finally the muscle-generating juices that are formed will influence for good each and every other muscle in human frame. The American gum-chewing habit, unromantic and commonplace as it looks, came honestly and sanely to the white man of to-day from the American Indian.

The pre-eminence of the Indian for musculature goes unchallenged. His muscles were made of iron and his endurance excelled both that of the lion and the gazelle. But the Redskin did not develop his hamstrings at the expense of funny bone, nor his biceps at the cost of his facial muscles. He was wont to hie him to the gum-gum tree, there to scrape off some of the resilient, tasty substance, and between meals as well as in periods of famine to practise mastication for the double purpose of strengthening his jaw and mouth as well as his stomach muscles.

Thus it is seen that things are not always what they seem, and chewing gum is not nearly so wicked and uncosmetic as certain prudes of the polite world would have you observe. Moreover, digestive troubles and tenderfooted incompetency of the flabby muscle sort are not the only punishments of faulty chewing. If there is man or woman with soul so dead that he or she will not thoroughly, vigorously and for a good period masticate their nutriment, the penalty of a long spell of nervous disorders may be the price.



## We Need METAL BOOKS

FOR a long while it has been believed by many that Thomas A. Edison would perfect metallic paper suitable for printing upon and binding into books, but it now appears that the great inventor is far too busy with other labors to undertake this important work.

This report came about, Mr. Edison explained to a committee from the American Library Association delegated to have a statement from him on the matter, through a statement he made to a newspaper man while discussing thin metal material to be used in his storage batteries. The inventor had perfected such thin sheets of nickel that the ideal of metal "paper" occurred to him.

The committee of the American Library Association was engaged in an investigation on the deterioration of paper and a possible means of preventing it when the newspaper stories came to their attention. After a long wait, not hearing anything further about it, they sought correct information as to what progress had been made in making metal paper from the inventor himself, and he wrote them a letter of explanation.

Mr. Edison explained that he was seeking a material for insuring perfect electrical conductivity in the positive tube of his storage battery and after many laborious experiments secured such thin sheets from pure metallic nickel that 200 of them together were only the thickness of a business card. He wrote the committee that these would be too thin for books and that it would take a lot of experimenting to produce the proper nickel sheets for such purpose, adding that he could not find time to do this, that he had never really experimented on metal "paper," but the idea had merely occurred to him.

Now the committee of the American Library Association is wondering who will have the courage to attack this problem and perfect a process for the making of suitable sheets of metal for printing and binding into books. This would solve the problem of keeping books. Rare old editions would not turn yellow and crumble away or fall prey to insects, but could be kept indefinitely. Of course, fire would destroy them, but they would stand more heat than paper and if made properly moisture would have no effect upon them.

Such paper for important state documents, for important legal and financial paper, even for wills, deeds, money, legal reports and such things, would prove of great value, and from this step those interested in this feel that it would not be so very long before the process would be perfected sufficiently to make it easy and cheap to print all books on metal pages. The committee from the American Library Association is casting anxiously about for some inventor—or many inventors—to attempt to do this very thing.