

VARIOUS

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"TESS."

A REMARKABLE example of the human-like intelligence of a chimpanzee, rivaling that of the celebrated "Mr. Crowley," of New York, so long the chief object of admiration in the museum of Central Park, was that of the subject of this sketch. "Tess" was captured in Africa by Allan Grosch and brought to Boston, where she was purchased by Frank C. Bostock. She was brought up with Mr. Bostock's little girl and was dressed the same as any child of three years. She walked upright, ate with knife and fork, drank from a cup, had better table manners than the average child of the same age, wore finger-rings, ear-rings, and pin, and always surveyed herself in the glass to see that her pin was on straight, and her dress hung right; she smoked a pipe, drew lines on a blackboard, wrote with a pen, and imitated Mr. Bostock's little girl in many ways. She uttered a few sounds which were understood by her master, and seemed to understand what was said to her. She died of pneumonia while being exhibited in the East, was purchased by Mr. C. F. Gunther and presented

by him to the Chicago Academy of Sciences. Her age was three years and seven months.

The chimpanzee (*Simia troglodytes*) is considerably smaller than the gorilla; old males reach a height of sixty-four inches; females, forty-eight inches. The arms are long, reaching a little below the knee, and possess great muscular power. In the feet the large toe is separated from the others by a deep incision; and the sole is flat. The hair of the chimpanzee is smooth, the color usually black, but in some specimens it is a dull, reddish brown. Chimpanzees walk on all fours, resting themselves on the calloused backs of their hands. The toes of the feet are sometimes drawn in when walking. Naturalists say there is a strong inclination in this species to show remarkably varying individual types, which has led to controversies as to whether there were not several different species.

That the chimpanzee was known to the ancients is made fairly certain by the famous mosaic picture which once adorned the temple of Fortuna, and which is said to be still preserved in the Barberini palace at Palestrina in Italy. This mosaic represents, among many other animals of the Upper Nile country, what is believed to have been the chimpanzee. A young specimen was taken to Europe in the beginning of the seventeenth century. They have been taken there repeatedly since and are not infrequent features of the European animal market. Several have been brought to the United States and placed in museums and menageries.

It was formerly believed that the chimpanzee was a gregarious animal, but it is now known that there are seldom more than five, or, at the utmost, ten living together. Sometimes, however, they gather in greater numbers for play. One observer claims to have seen at one time about fifty of them which had assembled on trees and amused themselves with screaming and drumming on the tree trunks. They shun human habitation. Their nests are built in trees, not at a great height from the ground. They break and twist and cross larger and smaller branches and support the whole on a strong bough. A nest will sometimes be found at the end of a bough, twenty or thirty feet from the ground. They change abiding places often in looking for food or for other reasons. Two or more nests are rarely seen in the same tree. Nests, properly so-called, consisting of inter-woven branches, as Du Chaillu describes, have not been seen by any of the other narrators.

When in repose the chimpanzee in the wild state usually assumes a sitting posture. He is often seen sitting or standing, but it is said the minute he is detected he drops on all fours and flees. He is an adept at climbing. In his play he swings himself from tree to tree and jumps with amazing agility. His food consists of fruits, nuts, buds, etc.

While "Tess" was remarkably intelligent she was too young to show the maturity of one in Nills' Zoological Garden in Stuttgart, an account of which is given by the celebrated painter of animals, F. Specht. This chimpanzee could laugh like a human being. He

took notice of this, for no other animal can show its joy by loud laughter. When he would take the sympathetic fellow under the arms, throw him in the air and catch him, the cage rang with his merry peals of laughter. One day he took along a piece of chalk and sat down on a chair. In a moment the chimpanzee was sitting on Specht's knees awaiting further developments. He put the chalk in the animal's hand, and leading it, drew several figures on the wall. When he released the chimpanzee's hand, the animal started to shade the drawings with such diligence that they soon disappeared, to the great amusement of the spectators.

There are now, or were a few years ago, two chimpanzees in the Stuttgart zoological garden, which are the closest of friends. The female had been there before and when the male arrived his box was put over night in her warm, roomy cage the presentation being intended for the morrow. When the box, which, by the way, had been upholstered, was opened and the male got out, they both stood on their hind legs for a few minutes earnestly gazing at each other. Then they flew into each other's embrace and exchanged hearty and repeated kisses; and the female brought her blanket, spread it on the floor, sat down on it and by gestures invited the male to do likewise. It made a charming picture to see these two taking their meals at a table. They both used spoons and did not in the least interfere with each other. The female had the peculiarity of cautiously taking the male's glass, and drinking a goodly portion out of that, too, after which she returned it. Both of these animals laughed heartily when at play.

Barnum, the American showman, had two chimpanzees, "Nip" and "Tuck," on exhibition in various cities and towns, but they did not display much intelligence, nor did they live long. Other attempts to introduce the chimpanzee have not been encouraging. The experiment of keeping one has not been tried in the South, however, where there are doubtless cities whose climatic condition would prove to be favorable for keeping chimpanzees much longer than is possible in the more northern zoological collections.

WHIPPOORWILL

Hark! I hear the voice again,
Softly now and low,
When the twilight's o'er the plain
And the first stars glow.
This is what it uttereth —
In a rather mournful breath —
"Whip-poor-will! Whip-poor-will!"

What has Will been doing now?
Has he truant played
With a sad, coquettish brow
From some simple maid?
Did he steal her heart away?
For I hear you always say
"Whip-poor Will! Whip-poor Will!"

Tell me now what Will has done.
Who's to whip him, dear?
Is he some scamp full of fun
That is straying near?
Have you caught him at your nest
By the ones you love the best?
"Whip-poor-Will! Whip-poor-Will!"

That is all you seem to say,
Little bird so shy.
Tell me now, without delay,
Why whip Will, oh! why?
There! your voice fades in the lea —
Leaving this command to me,
"Whip-poor-Will! Whip-poor-Will!"

— *Monroe H. Rosenfeld.*

TONGUES

W. E. WATT

THE tongue is said to be the stomach begun. It is the first organ of the digestive system which acts upon the food. It is the source of much of the pleasure of life, particularly to young people. As it stands at the entrance to the alimentary canal it is endowed with powers of detecting the qualities of whatever the hands present to the stomach.

In early life the system demands abundant supplies of good material to build up growth and maintain activity. The sense of taste is then peculiarly keen, and the appetite for good things is strong. After maturity the desires become less and one has not so much pleasure in eating unless by active labor or from some other cause the digestive organs are kept in a robust condition.

With the years the tastes change. We wonder how children can possibly eat such quantities in such combination. The food which fairly delighted us long ago has little or no attraction for us, and with many adults there is need for strong seasoning and condiments which children avoid.

The child clamors for sweets. The adult is inclined to check the child in eating that which would not digest in the adult's stomach.

But Herbert Spencer won the hearty esteem of the youngster when he gave scientific argument showing that growing children need highly concentrated foods to meet the demands of nature, and they may be permitted, in fact encouraged, to eat freely of foods which are unsuited to mature people.

The tongue's special work is telling us whether a given substance is good for us. Like other senses it may be deceived and is not always to be relied upon. And when it has told us once correctly we may make a serious mistake in following its advice too extensively so as to learn that too much of a good thing is not all good.

Nearly all substances have taste. That is, the tongue has power to tell us something about almost every substance in nature. Water is about the only substance found in nature that has no taste. But we rarely find water that is pure enough to be entirely without taste. Nearly all solids that can be dissolved in water have taste. So have nearly all liquids. When we say that water tastes good we recognize the mineral in it, or some combination of minerals that the human body needs in its economy.

The substances that the taste recognizes most readily are common salt, vinegar, quinine, pepper, and alcohol. Those least exciting to the tongue are starch, white of egg, and gum.

The tongue does its work by means of three sorts of papillæ which cover its surface. There are many very fine ones all over the tongue, but these are most numerous near the tip. Some larger ones which are not so pointed in form are also more plentiful

near the tip of the tongue. And there are from eight to fifteen much larger still that are arranged in rows like the letter V at the base of the tongue.

Bitter is tasted mainly at the back of the tongue. Sweet is tasted all along, but is most delightful at the base of the tongue, and it is by this cunning arrangement that nature gets the tongue to pass the sweet morsel along to the throat where it is seized and hurried downward by the act of swallowing.

These papillæ have within them capillary blood vessels and the filaments of nerves. They are the seat of the tongue's sensibility. Whatever is tasted must come into chemical action over these little points. Moderate pressure helps the sensation, so we smack our tongues sometimes when we are not in company. Cold deadens taste to some extent and heat acts in nearly the same way. Rinse the mouth with very warm or very cold water and then take in a solution of quinine at about forty degrees temperature and the bitter fluid will have almost no bitterness till the temperature of the mouth and its contents becomes somewhere near one hundred degrees.

Three things are necessary in a substance in order that it may be tasted, and it is curious to note how common are all three. First, it must be easily mixed with the saliva; second, it must easily spread itself about so that it may mingle with the mucus that always covers the papillæ; and third, it must be capable of acting chemically on the protoplasm of the end organs when once it gets into the taste bulb. All tasteless substances have one or

more of these qualities lacking. Wipe the tongue dry and place a sugar crystal upon it. No taste will be experienced until the spot is moistened.

All substances do not taste alike to different tongues. We have noted the difference in appreciation of certain foods in infancy and in mature years. Water tastes differently to the fever patient and to the well man. As substances taste differently at different times to the same person, so they vary with individuals. One tongue is found on careful examination to have three times as many papillæ as another, one system is more susceptible to chemical action than another, and the nervous system varies enough in different subjects to make a considerable difference in the powers of taste.

One guest at table is delighted with a dish which appeals not at all to the palate of his neighbor. In fact there are cases where the power of taste has been temporarily or entirely lost. In such cases the patient goes on with his daily eating in a mechanical way, not because it tastes good, but because he must.

There seem to be different nerves for sweet, for bitter, for salty things, and for acids. Substances are known to chemistry which act differently on the nerves of the front and those of the back of the tongue. They very curiously taste sweet to the nerves of the tip of the tongue and at the same instant bitter to those at the base. If leaves of the *Gymnema sylvestre* be chewed, sweet and bitter things are tasteless for awhile although acids and salts are tasted as usual.

Let an electric current pass through the tongue from the tip to the root and a sour taste will be experienced at the tip. But no one has yet explained why when the same sort of current is passed through in the opposite direction the taste is alkaline.

Place a small piece of zinc under the tongue and a dime on top. The saliva which moistens them will cause them to form a small galvanic battery. As they are allowed to touch each other at the tip of the tongue a sour taste will be experienced and in the dark a spark will appear to the eyes.

There is a pretty microscopic formation on the sides of some of the papillæ. It consists of rows of small openings or sacs egg-shaped with very minute mouths at the surface. These are known to science as taste bulbs. They are so small that three hundred of them put together the long way will scarcely reach one inch. They are so numerous that 1,760 have been counted on one papilla of an ox's tongue. They are not entirely confined to the surface of the tongue, for they have been found in large numbers upon the soft palate and the uvula, and many have been discovered on the back side of the throat and down into the voice box, some of them even appearing upon the vocal cords. Their form is much like that of a long musk melon, but they are too small to be seen by the naked eye. The outer part or rind consists of rows of cells evidently formed to hold what is within. On the inside are from five to ten taste cells which are long enough to reach the whole length of the bulb and protrude slightly at the opening where they are finely pointed. They are attached at the other end and branch

out as if to run to several extremely fine divisions of the nerves.

Birds and reptiles have no taste bulbs in their papillæ. Tadpoles and freshwater fishes have similar bulbs in their skin, and it is thought they enjoy the taste of things around them without the necessity of taking them in at the mouth.

We give the sense of taste more credit sometimes than it merits. What we regard as tastes are often flavors or only smells. What is taken in at the mouth gets to the nose by the back way if it is of the nature of most spices, and so by use of the nose and the imagination we taste things that do not affect the tongue at all. A cold in the head shows us we do not taste cinnamon, we merely experience its pungency as it smarts the tongue while its flavor we enjoy only with the nose.

With some substances we have a mixed experience that passes for taste, but it is really a combination of taste, smell, and touch. With the nostrils held one can scarcely distinguish between small quantities of pure water and the same with a very little essence of cloves. The difference is easily observed with the nostrils open or after swallowing, for the odor of the mixture gets readily into the nose from either direction.

It is curious to note that, although there are so many varieties of taste, man has but few words to describe them with. We know the taste of a thousand substances, and yet we are in nowise superior to the veriest savage in the matter of speaking about their flavors. We are obliged to speak in the same manner as the wild man of the forest and say that a given taste is like the taste

of some other thing, only different.

One of the lowest forms of tongues is that of the gasteropod. All snails and slugs are gasteropods. They have instead of a regular tongue a strip that is called a lingual ribbon, one end of which is free and the other fastened to the floor of the mouth. Across the ribbon from left to right run rows of hard projections almost like teeth. Whatever the mouth comes against is tested for food qualities by this rasping ribbon which files away at the substance and wears away not only what it works upon but the ribbon itself. This loss of tongue is no serious affair to the gasteropod, for he finds his tongue growing constantly like a finger-nail and he needs to work diligently at his trade or suffer from undue proportions of the unruly member. Snails in an aquarium gnaw the green slime from the sides of the vessel with their lingual ribbons, and the process may be seen to more or less advantage at times.

Taste is not all confined to tongues. Some people have papillæ on the inside of the cheek. Medusæ (Jelly Fish) have no tongues, but the qualities of the sea-water are noted by them. As soon as rain begins to fall into the sea they proceed directly towards the bottom, showing a decided aversion to having their water thinned in any way.

Leeches show their powers of distinguishing tastes when they take in sweetened water quite freely, but suck at the skin of a sick man much less than at that of one in good health.

Taste in insects has its probable seat in many instances in a

pair of short horns or feelers back of the antennæ. These are constantly moving over the parts of that which the insect is feeding upon, and so apparently enjoyable is the motion of them that many scientists have concluded that these are the taste organs of the insects having them. At the same time it is quite probable that in all insects furnished with salivary glands, a proboscis, or a tongue, the power of taste is also or exclusively there.

Fishes seem to do most of their tasting somewhere down in the stomach, for they pursue their prey voraciously and frequently swallow it whole. With their gristly gums, in many cases almost of the toughness of leather, there can be but little sensation of taste. Their equally hard tongues, many times fairly bristling with teeth constructed for capturing, but not for chewing, cannot possibly afford much of a taste of what is going down the throat with the rushing water passing through the open mouth and gills.

Serpents which swallow their food alive can get but little taste of their victims as they pass over the tongue, although they are deliberate in the act and cover them with a profusion of saliva.

It is quite possible that cattle in chewing the cud get the highest enjoyment possible from this sense. They enjoy their food at the first grasp of it, and prove it by their persistence in struggling for certain roots and grasses, but their calm delight afterwards as they lie in the shade and bring up from the recesses of their separate stomachs the choice and somewhat seasoned pellets of their morning's gleanings is an indication of their refined enjoyment of the pleasures of this sense.

Sir John Lubbock calls attention to the remarkable instances of certain insects in which the foods of the perfect insect and of the larvæ are quite different. The mother has to find and select for her offspring food which she would not herself touch. "Thus while butterflies and moths feed on honey, each species selects some particular food plant for the larvæ. Again flies, which also enjoy honey themselves, lay their eggs on putrid meat and other decaying animal substances."

Forel seems to have found that certain insects smell with their antennæ, but do not taste with them. He gave his ants honey mixed with strychnine and morphine. The smell of the honey attracted them and they followed what seemed to be the bidding of their antennæ, but the instant the honey with its medication touched their lips they abandoned the stuff.

Will fed wasps with crystals of sugar till they came regularly for it. Then he substituted grains of alum for the sugar. They came and began their feast as usual, but soon their sense of taste told them there was some mistake and they retired vigorously rubbing their mouth parts to take away the puckering sensation of the alum.

Cigar smokers who really enjoy the weed confess that they cannot tell except by sight when the cigar goes out. In the dark they keep right on drawing air through the cigar, and the pleasure of the smoke seems to be in nowise diminished after the cigar is out unless the smoker discovers he has no light. This seems to show that the sense of taste has little to do with the pleasure

of smoking.

Tongues are used in tasting, seizing food, assisting the teeth to chew, covering the food with saliva, swallowing, and talking. Man and the monkey, having hands to grasp food, do not use their tongues for this purpose. The giraffe does so much reaching and straining after food in the branches of trees that his tongue has become by long practice a deft instrument for grasping. The woodpecker uses his tongue as a spear, and the anteater runs his long tongue into the nest of a colony of ants, so as to catch large numbers of the little insects on its sticky surface.

Cats and their kind have a peculiarity in that instead of having cone-shaped papillæ their tongues are covered with sharp spines of great strength. These are used in combing the fur and in scraping bones.

Two characteristic accomplishments of man would not be his if it were not for his versatile tongue; they are spitting and whistling. The drawing of milk in nursing is an act of the tongue, and the power of its muscles as well as the complete control of its movements is an interesting provision of nature. It is believed by some that the pleasures of the taste sense are confined to such animals as suckle their young.

Tongues are rough because the papillæ, which in ordinary skin are hidden beneath the surface, come quite through and stand up like the villi of the digestive canal. The red color of the tongue is due to the fact that the papillæ are so thinly covered that the blood circulating within shows through.

THE MOUNTAIN LION

THIS is only one of the names by which the puma (*Felis concolor*) is known in the United States. He has different local names, such as tiger, cougar, catamount and panther, or "painter," as the backwoodsmen entitle him, and silvery lion.

The puma ranges the whole of both the Americas from the Straits of Magellan to where the increasing cold in the north of Canada blocks his passage. Like many other large animals, however, the puma has retired before the advance of civilization, and in many of the more thickly populated portions of the United States a straggler, even, is rarely to be found.

The haunts of the puma depend upon the nature of the country. In sections well-wooded he decidedly prefers forests to plains; but his favorite spots are edges of forests and plains grown with very high grass. He always selects for his abode such spots as afford some shelter, in the vicinity of rocks which have caverns for secure concealment, and in which to bring forth his young. He spends the day sleeping on trees, in bushes, or in the high grass; in the evening and at night he goes forth to hunt. He sometimes covers great distances in a single night, and sportsmen do not always find him near the place where he struck down his prey.

All smaller, weak mammals are his prey – deer, sheep, colts, calves, and small quadrupeds generally. When, however, his prey is so large that it cannot all be devoured at one meal, the animal

covers it with leaves or buries it in the earth, returning later to finish his repast. This habit is sometimes taken advantage of by his human enemy, who, poisoning the hidden carcass with strychnine, often manages to secure the lion when he comes back to eat it. The use of poison against these and other carnivorous animals by the farmer and stock-raiser has become so general in the West they are rapidly becoming exterminated. If it were not for some such means of defense as this, the sheep-raisers and cattle-growers would be quite powerless to protect their herds from the attacks of the mountain lion and other beasts of prey.

The puma is a very bloodthirsty animal, and whether hungry or not, usually attacks every animal, excepting dogs, that comes in his way. When hungry, however, he disdains no sort of food, feeding even upon the porcupine, notwithstanding the quills which lacerate his mouth and face, or the skunk, heedless of that little animal's peculiar venom. Ordinarily the puma will not attack man, fleeing, indeed, from him when surprised, but he has been known when emboldened by hunger to make such attacks. He, of course, sometimes kills the hunter who has wounded him, though even then, by the cautious, he is little feared; but an unprovoked assault, such as the mangling of a woman in Pennsylvania in the eighties, is rare.

It is the habit of the puma to spring upon his prey from an eminence such as a ledge of rocks, a tree, or a slight rise of ground. If he fails to strike his victim, he seldom pursues it for any considerable distance. In northern regions, however, he

sometimes pursues the deer when they are almost helpless in the deep snow. When he has seized his victim, he tears open its neck, and laps its blood before he begins to eat. He devours every part of a small animal, but the larger ones he eats only in part – the head, neck, and shoulders – burying the rest.

Very young cubs when captured soon become thoroughly tamed, enjoying the liberty of a house like a dog. When petted they purr like cats and manifest their affection in much the same manner. When displeased they growl, but a roar has never been heard from them. There is one drawback to a tame puma, however, says Brehm. When he has great affection for his master and likes to play with him, he hides at his approach and unexpectedly jumps on him. One can imagine how startling and uncomfortable would be such an ill-timed caress. An old puma, when captured, sometimes rejects all food, preferring starvation to the loss of liberty.

Every movement of the puma is full of grace and vigor; he is said to make leaps of eighteen feet or more. His sight is keenest in the dusk and by night; his sense of smell is deficient but his hearing is extremely acute.

The lair in which the female brings forth her young is usually in a shallow cavern on the face of some inaccessible cliff or ledge of rocks.

In the southern states, Audubon says, where there are no caves or rocks, the lair of the puma is generally in a very dense thicket or in a canebrake. It is a rude sort of bed of sticks, weeds, leaves

and grasses. The number of cubs is from two to five. In captivity two usually are born, but sometimes only one.

THE HOLLY TREE

O reader! hast thou ever stood to see
The Holly tree?
The eye that contemplates it, well perceives
Its glossy leaves,
Ordered by an intelligence so wise
As might confound the atheist's sophistries.

Below a circling fence its leaves are seen
Wrinkled and keen;
No grazing cattle through their prickly round
Can reach to wound;
But as they grow where nothing is to fear,
Smooth and unarmed the pointless leaves appear.

I love to view these things with curious eyes,
And moralize;
And in this wisdom of the Holly tree
Can emblem see
Wherewith perchance to make a pleasant rhyme,
One which may profit in the after-time.

Thus, though abroad perchance I might appear
Harsh and austere,
To those who on my leisure would intrude

Reserved and rude,
Gentle at home amid my friends I'd be
Like the high leaves upon the Holly tree.

And should my youth, as youth is apt, I know,
Some harshness show,
All vain asperities I day by day
Would wear away,
Till the smooth temper of my age should be
Like the high leaves upon the Holly tree.

And as when all the summer trees are seen
So bright and green,
The Holly leaves a sober hue display
Less bright than they,
But when the bare and wintry woods we see,
What then so cheerful as the Holly tree?

– *Robert Southey.*

THE LEMON

DR. ALBERT SCHNEIDER,

**Northwestern University
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THE lemon is the fruit of a small tree from ten to fifteen feet high. It is not particularly beautiful, being rather shrubby in its appearance. It is an evergreen, bearing leaves, flowers, and fruit all the year round. The flowers occur singly in the axils of the leaves. The calyx is persistent, that is, it does not drop off like the corolla, and may be found attached to the base of the fruit. The corolla consists of five spreading petals of a purplish-pink color.

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