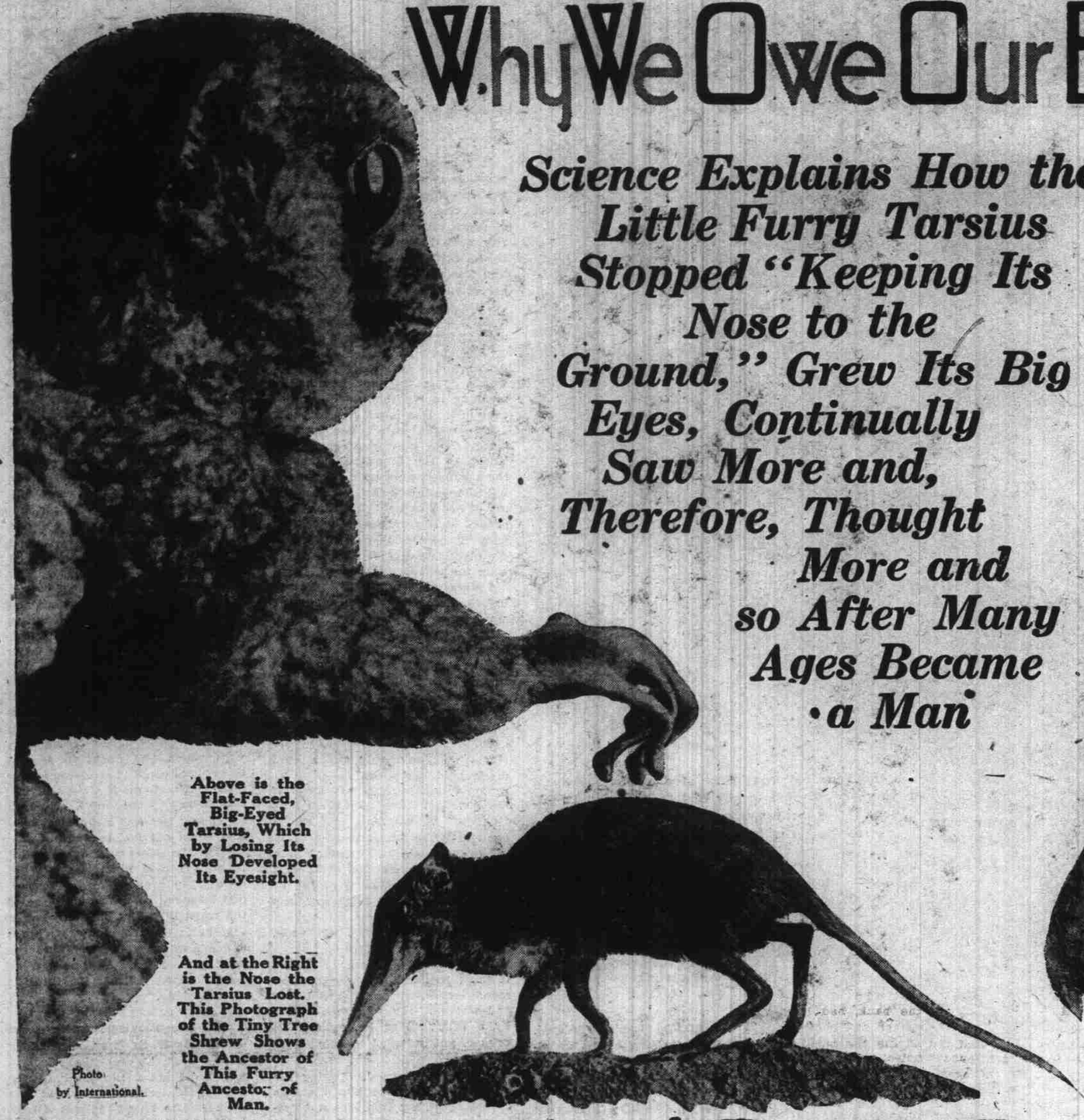
# Why We Owe Our Brains to a Short Nose

## *Science Explains How the Little Furry Tarsius Stopped "Keeping Its Nose to the Ground," Grew Its Big Eyes, Continually Saw More and, Therefore, Thought More and so After Many Ages Became a Man*



Above is the Flat-Faced, Big-Eyed Tarsius, Which by Losing Its Nose Developed Its Eyesight.

And at the Right is the Nose the Tarsius Lost. This Photograph of the Tiny Tree Shrew Shows the Ancestor of This Furry Ancestor of Man.

Photo by International.

Man's Nose, as It Adorns Him To-day, Is a Comparatively Modern Growth. For Many Tens of Thousands of Years He Was Almost as Flat-Nosed as His Remote Ancestor—the Tarsius—as This Remarkable Scientific Reconstruction of a Woman of Half a Million Years Ago Shows.

SCIENCE has at last discovered the animal from which man evolved, "the true ancestor of all of us.

Our ancestor is the tarsier, also called the tarsius, a strange little snub-nosed, saucer-eyed, fur-coated, long-fingered, tree-dwelling, monkey-like animal, found only in parts of southeastern Asia. It is really a kind of lemur.

The tarsius is known in native language as "the specter," on account of the unearthly appearance of its great eyes. It still haunts the forests of Borneo, Java and the neighboring islands of southeastern Asia, and awakens in the peoples of those lands a superstitious dread—a sort of instinctive horror at the sight of the ghost-like representative of their first ancestor.

Professor Elliott Smith, of the University of Manchester, the famous English biologist, recently declared that the tarsius marked the beginning of the human line of human evolution. Still more recently the president of the Hunterian Society, a leading organization of English surgeons, expressed the opinion that Elliott Smith's view was the correct one, while other scientists in various parts of the world have come to the same conclusion.

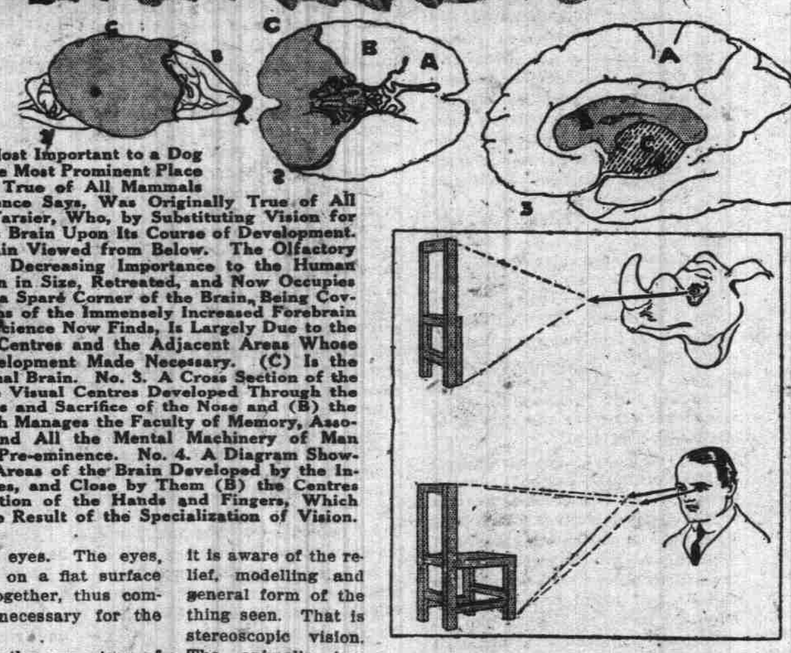
The astonishing explanation why the tarsius started the human line of evolution is that this creature shortened its nose, giving it perfect stereoscopic vision, and thereby enormously developed its brain. Other lines of evolution started at the same time, but none of them reached those forms of development which led to the supreme intelligence of man.

This scientific discovery is of vital importance in the study of man. Everybody knows that scientists have long held it to be proved that man is evolved from the lower animals and that the apes are his nearest relations. The idea that man is descended directly from the apes has been generally abandoned—they are only his cousins.

At some remote time in the past, millions of years ago, the ancestry of man and the apes diverged. For a long time the two separate lines developed through similar stages, but at last they grew perceptibly apart. The ape's line of descent ended in the brutal and degraded animals that are found in the wilds to-day—the gorilla, chimpanzee, orang-outang, etc. Man continued to develop ages later than the ape, and there is reason to believe he is progressing still to higher forms.

Millions of years ago, in the eocene or "Dawn" period of creation, when reptiles still dominated the earth, this queer little tarsius came unobtrusively into existence and started on the long and painful journey that ended in nature's greatest achievement—man.

The tarsius has a very flat nose, scarcely any at all in fact, so that there is no projection to interfere with perfect stereoscopic vision by both eyes. The eyes, moreover, are situated on a flat surface and reasonably near together, thus completing the condition necessary for the human type of vision.



No. 1. The Brain of a Dog Showing (A) the Olfactory Lobe or Smelling Sense; (B) the Forebrain; (C) the Back Brain. As the Smelling Sense Is the Most Important to a Dog This Organ Occupies the Most Prominent Place in Its Brain. This Is True of All Mammals Except Man, and, Science Says, Was Originally True of All Mammals Except the Tarsier, Who, by Substituting Vision for Smelling, Started Man's Brain Upon Its Course of Development. No. 2. The Human Brain Viewed from Below. The Olfactory Bulb (A) Through Its Decreasing Importance to the Human Organism Has Shrunken in Size, Retreated, and Now Occupies What Might Be Called a Spare Corner of the Brain, Being Covered by the Convolutions of the Immensely Increased Forebrain (B), Which Increase, Science Now Finds, Is Largely Due to the Growth of the Visual Centres and the Adjacent Areas Whose Enlargement This Development Made Necessary. (C) Is the Shrunken Back or Animal Brain. No. 3. A Cross Section of the Brain Showing (C) the Visual Centres Developed Through the Greater Use of the Eyes and Sacrifice of the Nose and (B) the Corpus Collosum, Which Manages the Faculty of Memory, Association, Observation and All the Mental Machinery of Man Which Gives Him His Pre-eminence. No. 4. A Diagram Showing (A) the Exterior Areas of the Brain Developed by the Increased Use of the Eyes, and Close by Them (B) the Centres Whch Control the Motion of the Hands and Fingers, Which Were Developed as the Result of the Specialization of Vision.



The Difference a Big Nose Makes. To Animals Which, Like the Rhinoceros, Can See Only Separately Out of Each Eye, Everything Appears Flat. Man, Having No Obstruction Between His Eyes, Sees with Both of Them Together, Thus Giving Him What Is Known as Spectroscopic Vision or Perception of the Modelling of an Object.

This short nose was the one piece of evidence needed to decide the tarsius's claims to be our ancestor. The point is thus explained by the British scientist, Professor Langdon Brown:

"Below the mammals the dominant sense is that of smell, but the tarsius, by shortening the nose, was able to bring its eyes forward and achieved stereoscopic vision. The increased information thus afforded as to the shape of things developed skilled movements of the hands and a finer sense of touch, with a corresponding cortical area of the brain to correlate touch with vision.

"Man represents the straight line of development. It is the animals which have departed from this straight line and for self preservation have developed specialized characters, for example, the great strength of the gorilla, which have failed in the race for supremacy. Man has become the greatest of the primates because of his faithful dependence upon development of the brain."

Why is the short nose of such vital importance? Because it leaves the eyes free to attain the perfect human type of vision and because that form of vision stimulates the brain by affording a more complete image of every object seen. Man sees a combined image with his two eyes, while nearly every animal sees two separate flat images with its two eyes.

In the case of a solid object, each eye of man sees to some extent the sides, the depth and form of the object. The brain then combines the two images received into one and through this combined image it is aware of the relief, modelling and general form of the thing seen. That is stereoscopic vision. The animal's two eyes are nearly always separated by a large nose or snout so that combined vision is impossible. The animal must see a perfectly flat image without any relief. We know that the horse, the dog and most other animals turn their heads to look at an object, and it is evident that they are looking with one eye only at the thing which interests them. The flat-faced apes apparently enjoy stereoscopic vision, and this is one reason why they rank higher than other animals.

It will be clear to everybody that the power to see an object perfectly, to judge its size and its uses would lead to greater brain development—greater intelligence.

Another essential fact is that the tarsius lost its nose because it took to tree life and therefore became no longer mainly dependent on the sense of smell for its living, as were the animals living on the ground. The evolutionary ancestors of the tarsius were developing rather long noses, but after some of them adopted tree life they shortened this organ and started on the way to become man.

Professor Elliott Smith traces the ancestry of man even back of the tarsius. This animal is an insectivore and is evidently related by this eating habit and the peculiar form of its legs and feet to the jumping shrews. The tree shrew of Asia represents the stage immediately behind the tarsius.

The tree shrews are small, squirrel-like animals, which feed on insects and fruit which they usually seek in trees. They are of lively disposition and great agility. They have relatively large brains and present in the structure of their skull, teeth and limbs many evidences of kinship with the tarsius and the Malaysian lemurs.

But the tree shrews have prominent noses, a feature which, as we have seen, some individuals must have lost in order to become tarsius.

In all the animals except the tree-dwellers the centre of smell occupies the greater part of the higher brain. In the words of Professor Elliott Smith, "the cerebral hemisphere is predominantly olfactory in function." Therefore the animal's behavior is influenced to a much greater degree by smell impressions received in the brain than by those of the other senses.

This was partly due to the fact that to a small, land-grubbing animal the guidance of smell impression, whether in the search for food or as a means of recognition of friends or enemies, was much more serviceable than all the other senses. Thus the small creature's mental life was passed essentially in an atmosphere of odors, and every object in the outside world was judged primarily by its smell. The senses of touch, vision and hearing were merely auxiliary to the compelling influence of smell.

Once such a creature left the solid earth and took to tree life the guidance of the smelling sense lost much of its usefulness. On the other hand, life among the tree branches is favorable to the high development of vision, touch and hearing. Moreover, it demands an agility and quickness of movement to prevent falling and so forth, which necessitates an efficient motor cortex to control such actions as tree life involves.

Tree life also demanded a well-developed muscular sensibility to enable movements up among the branches to be carried out with precision and quickness. In the struggle for existence, therefore, all arboreal mammals, such as the tree shrews, suffered a marked diminution of their olfactory apparatus and developed a brain cortex in which large areas were given up to visual, tactile, acoustic and motor functions. At the same time the brain developed a mechanism for blending in consciousness the effects of the impressions pouring in through the avenues of these senses.

Thus a more equable balance of the senses was brought about in the brain of the tree animals. At the same time the potency of the forces of natural selection was immensely enhanced by the fact that the inquisitiveness of an animal which can learn by experience was leading these plastic insectivores into all kinds of situations which were favorable for the operation of selection.

"Toward the close of the Cretaceous Period," says Professor Elliott Smith, "some small, arboreal, shrew-like creature took another step in advance which was fraught with the most far-reaching consequences, for it marked the birth of the primates and the definite branching off from the other mammals of the line of man's ancestry."

Finally a super-intelligent tree shrew gave birth to the flat-nosed tarsius, which was quite emancipated from the dominating influence of olfactory impressions, the sway of which was already shaken but not quite overcome when the shrew took to tree life.

This change to a short-nosed, quick-eyed form was associated with an enormous development of the visual area in the brain cortex, which also became more specialized in structure. Vision then entirely usurped the controlling place once occupied by smell.

Tree life also added to the importance of the sense of hearing. The cortex area of this sense showed a noteworthy increase in the tarsius.

The high specialization of the sense of sight awakened in the tarsius the curiosity to examine the objects around it with closer minuteness, and supplied guidance to the hands in executing more precise and more skilled movements than the tree shrew attempts.

"Such habits," says Professor Elliott Smith, "linked up the various cortical areas in bonds of more intimate associations with the visual cortex, and stimulated the process of specialization within or alongside the motor cortex of a mechanism for regulating the action of that cortex itself—an organ of attention which co-ordinated the activities of the whole neopallium so as more efficiently to regulate the various centres controlling the muscles of the body.

"In this way there was evolved from the motor area itself, in the form of an outgrowth placed at first immediately in front of it, a formation which attains much larger dimensions and a more pronounced specialization of structure in the primates than in any other order; it is the germ of that great prefrontal area of the human brain which is said to be 'concerned with attention and the general orderly co-ordination of psychic processes,' and as such, is in far greater measure than any other part of the brain, deserving of being regarded as the seat of the higher mental faculties and the crowning glory and distinction of the human fabric."

The tarsius and lemurs and other early ancestors of man were a small and humble folk, who led a quiet, unobtrusive and safe life in the branches of the trees, taking small part in the fierce competition for size and supremacy that was being waged upon the earth beneath them by their carnivorous and colossal brethren. They came into existence when the sabre-toothed tiger, the woolly rhinoceros, the palaeotherium, the cave bear and gigantic crocodiles roamed the earth.

All the time these little tree dwellers were cultivating that equable development of all their senses and limbs. And that special development of the more intellectually useful faculties of the mind which, in the long run, were to make them the progenitors of the dominant mammal—that creature which was to obtain the supremacy over all others while still retaining much of the primitive structure of limb that his competitors has sacrificed. For man, Professor Elliott Smith asserts, shows many more primitive characteristics than his nearest monkey relatives.

The later stages of the chain of evolution have been, before this, more fully proved and described. From the tarsius there evolved arboreal animals of the inferior long-tailed monkey type, and from these one branch evolved into man and the other branch into the true apes, such as the chimpanzee, the gorilla and the orang-outang.

At a certain point there was a monkey that showed an equal tendency toward the human type and the ape type. Then came a descendant that was more human and another that was more ape-like.

There came a time when man's ancestor descended from the trees and developed his feet for running and walking and used the brain he had developed in the trees. In this section of his ancestry there are several pre-human forms to be discovered. We are familiar with one such form in the ape-like man, "Pithecanthropus Erectus," found in Java. After that came the early prehistoric forms, such as the Neanderthal man, and finally the civilized man, "Homo Sapiens," of to-day.