



impronte

year 1 - issue n.1 - march 2003

Welcome to the first issue of your newsletter "Impronte" (footprints)!

This is a collection of information about our activities and curiosities of nature which we hope may some day come useful to you.

The "Perché, perché, perché" (why, why, why) section is waiting for your most outlandish questions. The kind of questions you would never dare to put to your teachers let alone your elder brothers or sisters. Do not be afraid, we shall attempt to answer those searching questions.

"The woodsman" - will lead us through the world of plants, from the reed thicket on the banks of a river to the dense oak grove on the side of a hill.

We are also planning other interesting sections :

"Who put the foot in it" - will teach us all the tricks to enable us to recognise without fail the tracks of our favourite animals;

"Grownups were little ones too" - a bit of history of science (please do not be frightened) will help us understand how our present knowledge has been built up by research of so many people who lived before us;

there will be sorcery and amazing things to be discovered in "The young chemist" - section and much more.

So feel free to browse and let us know your views and suggestions which will assist us to improve this little newsletter. Write to :

impronte@centrostudietologici.org

Please let us know your name, your age and the country in which you live.

A warm greeting from the editorial board



perché, perché, perché?

readers ask the questions

Do crabs have saliva?

Matteo Böhm (aged 8, Roma)

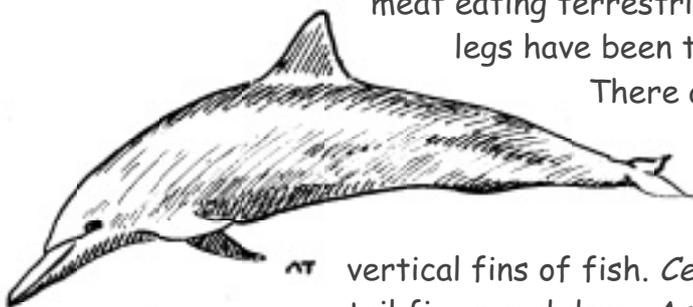
We call crabs those aquatic animals, largely living in the sea, that belong to the **Order** of *Decapoda* in the *Crustacea Class*. The intestine of *crustacea* is divided in three parts : anterior, middle and posterior. The anterior intestine is made up by the oesophagus and by an apparatus designed to mince food. Connected to the alimentary canal we find the *saliva glands*. These are not as specialised as our own glands but do perform some digestive tasks. In some species of *crustacea* the saliva glands can even produce venomous matter used to immobilise or kill their prey.



Why do dolphins and whales have horizontal fins?

Alessandro Belli (when he was 10 year of age, Radicondoli, Italy)

Dolphins and baleen whales are **Mammals** belonging to the order of *Cetacea* (**Whales**). Fossil findings suggest that these animals originate from a primitive meat eating terrestrial ancestor. *Cetacea's* front legs have been transformed into fins.



There are only left over traces of their hind legs and the tail has taken the shape of a horizontal fin, unlike the vertical fins of fish. *Cetacea* swim by flicking their tail fin up and down. As well as pushing the animal forward the tail fin also acts as a rudder. In the course of evolution, the skeleton and muscles of terrestrial mammals have adapted in a way such that their **limbs** (**paws**) can sustain the weight of the body and guarantee an efficient motion thanks to their forward and backward movements. So, while

perché, perché, perché? our readers' questions continue

fish obtain forward motion by a wave of horizontal contractions of the trunk's muscles, terrestrial mammals (save for the special adaptations by bats to allow them to fly), achieve their locomotive push by vertical movement of the limbs and trunk, which in turn promotes the shift of the body weight from one moving limb to another. The structure and shape of the skeleton and muscles of whales corresponds to the evolution cycle undergone by terrestrial vertebrate animals from which they originate. They have had to hone and specialise their skill to live in water from the structural formation inherited from their ancestors. For this reason *Cetacea* propulsion is achieved by vertical movement of the posterior fin which through evolution has acquired a horizontal position so as to maximise its pushing power.

Why do bats sleep with their head down ?

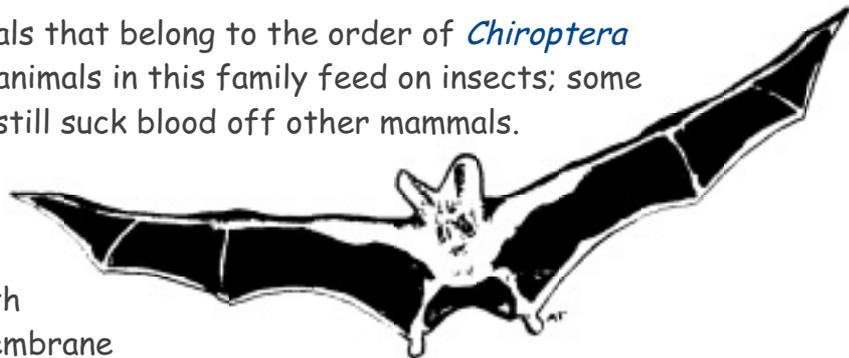
Guglielmo Iani (aged 7, Radicondoli, Italy)

Bats are small mammals that belong to the order of *Chiroptera* (hand-winged). Most animals in this family feed on insects; some eat fruit and others still suck blood off other mammals.

Their fore-limbs (paws) have evolved into flying tools.

Bats are endowed with a thin elastic wing membrane

(*plagiopatagium*) covering the body and limbs. The forelimbs are very elongated and act as support for the membrane. Only the thumbs are not covered. Some species of bats can land on the ground without any problem and are able to then take off; others instead are only able to land by clinging their hind paws onto anything in vertical position which causes them to come to rest in the peculiar head down position. It is for this reason that the majority of bats sleep in this characteristic "comfortable" position by clinging to the vault of a cave or a beam of a barn, well away from potential predators. The resting position of these animals' muscles and tendons is head down. Besides it is easier for them to take off again by letting go of the grip and opening their wings without hardly any effort. As you can see there are a good many advantages in sleeping head down.



Roberto Cozzolino has answered the questions put by Guglielmo, Alessandro and Matteo

Drawings are by Annette Tillmann

perché, perché, perché? our readers' questions continue

Why do we cut our nails?

Marta Piragine (aged 7, Cosenza, Italy)

Have you noticed that at least once a month we must cut our nails?

This means that nails grow! But how do animals manage to cut their nails? Well, each one has his own technique.

The cat scrapes the forepaws on a piece of wood or other rough surface. This behaviour is normally referred to as "clawing" (it is really bad news when a cat starts clawing in the sitting-room at home!). Our little felines wear out and sharpen their claws in this fashion as do their larger cousins (tigers and lions).

A different matter altogether when it comes to animals endowed with hoofs (which in practise is a large nail). The hoof protects the foot and wears out while walking and running. So much so that humans are forced to shoe their horses, since by walking them on hard and tarmac roads (not just on soft ground) the hoof wears off too quickly.

One last thing: our own nails grow at the rate of three millimetres a month. We must therefore resign ourselves to cut our nails frequently, unless you prefer to wear them out in some other way!
Good bye.

Carla Cordischi has answered
Marta's questions
Photographs from the CSE archive



The woodsman

THE TREE CALENDAR

Trees have been associated with gods from the very beginning of our civilisation (pre-Hellenic period) and for a long time even by the barbaric people of Europe.

The tree Calendar is the most tangible evidence of the correlation between the natural and the supernatural.

The tree Calendar is divided into thirteen lunar months each of twenty eight days which we will now list :

24 December - 20 January	olive tree
21 January - 17 February	sorb (service tree)
18 February - 17 March	ash
18 March - 14 April	cornelian tree
15 April - 12 May	willow
13 May - 9 June	wild pear tree
10 June - 7 July	oak
8 July - 4 August	holm oak
5 August - 1 September	walnut
2 September - 29 September	vine
30 September - 27 October	ivy
28 October - 24 November	lime tree
25 November - 22 December	myrtle



Myrtle (Myrtus communis)

The lunar year therefore had 364 days with one extra day, 23 December, between the end of one year and the start of a new one. This day was considered inauspicious because it was the eve of the winter solstice, the death of the old year. The plant associated with this day was the yew, which was also referred to as the tree of death.

The day of the winter solstice, 24 December, was represented by the red fir, symbolically associated with giving birth and the start of life as it was dedi-



Wild pear tree (Pyrus communis)

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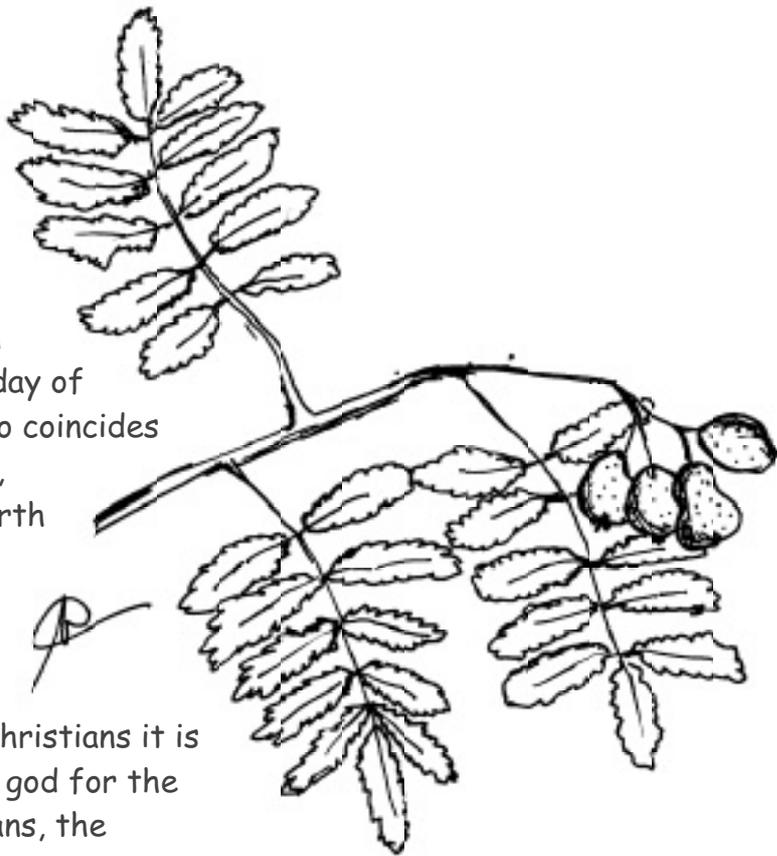
The woodsman (continued)

cated to Artemis, the goddess of the moon and of nature and the patron of pregnant women. The day associated with the red fir is the first day of the lunar year which also coincides with the winter solstice, therefore with the rebirth of the sun.

The birth of the Divine Baby is traditionally located between 24 and 25 December: for Christians it is Christ, but also the Sun god for the Babylonians, the Egyptians, the Phoenicians, the Greeks and the Romans.

Probably the origin of the use of the red fir tree as the symbol of Christmas, later also accepted by Christians, is to be found in this long standing association with the red fir tree.

Out of all the lunar months, only February has survived in our solar calendar. Still only twenty eight days, perhaps because it is thought of as the month of great ritual purification.



Sorb - service tree (*Sorbus domestica*)



Cornelian tree (*Cornus mas*)

Alessandro Ceppatelli is the woodsman, he is also responsible for the drawings appearing featured in this section. The photograph is taken from the CSE archive

Incredible! But could it be true?

FLEA DRAWN VEHICLE



TUGGING SEAL



Drawings taken from "Le ricreazioni scientifiche"
(*Scientific Recreation*) by Gastone Tissandier
published by F.lli Treves Editori, Milan 1882

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(footprints)

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