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C. S. E.

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A collection of information and curiosities on the most varied nature subjects

The "perché,perché, perché" (why, why, why) section is eager to answer your most unusual questions. Read on to find out more on the subject of beauty. Remember to address all your questions to:

The Editor, Corbaiola News,
Centro Studi Etologici, Convento dell'Osservanza 53030 Radicondoli (Si)
or email us at
notiziario@centrostudietologici.org
Don't forget to write your name, age and where you are writing from.

In this issue "The woodsman" will talk to us about the science of silviculture. All things great and small in our "Mr. know-it-all corner". Learn all about water vacuum and the combustion of a candle in our "Incredible!" section.

A warm greeting from all the Editorial Board.

Photograph of a Lanner falcon (*Falco biarmicus*)

perché, perché, perché?

readers ask the questions

Why are some people beautiful? Why does beauty exist?
Livia (10 year old, Radicondoli)

Dear Livia, in answer to your question I would like to start off by citing a paragraph I read in one of Charles Darwin's' most famous books: The descent of man and selection in relation to sex; entitled "on the influence of beauty in determining the marriages of mankind". Undoubtly, I find this short paragraph an appropriate opening in answer to your question; the matter is however more complex. Firstly, because as we have seen around the world what appears beautiful to some can on the contrary appear ugly to others. This has led scientists to believe that there is a period in life when in each one of us the concept of beauty and ugliness is defined. In mankind this period is between the age of eight and fourteen, it is during this lapse of time that our preferences become delimitated. Being able to decide what we like and what we do not like, what is beautiful and what is not offers us a great opportunity: the opportunity of choice. The sensations we perceive when we observe a sunset, when we listen to sublime music, when we stroke the soft fur of our cat; all these sensations are beautiful. Speaking of a beautiful person we do not necessarily refer to the physical aspect, we take into consideration the character, the virtues. The choice of our friends, of our loved ones falls on those we appreciate most taking all these aspects into consideration. An old Italian proverb says: "you like who you look alike" meaning that in part our preferences fall on those in which we recognize a certain familiarity in, on behaviours and aspects we are emotionally tied to; if you have a brother with brown curly hair and green eyes it might be more probably that when you grow up you will fall in love with a boy with brown curly hair and light eyes.

Livia's question has been answered by R. Cozzolino. The photo is a detail taken from an oil portrait by Filippo Cozzolino, end 19th Century

The woodsman

THE SILVICULTURE

The word silviculture derives from two Latin terms: *silva* meaning woods or forest, and *cultura* in the sense of cultivation of plants. With the word silviculture we intend a series of techniques for the cultivation of trees. Woodland areas provide man with many useful products: timber for building, firewood for both domestic and industrial use, fruits and berries from the undergrowth and meat from the wildlife present in these areas.
We cannot consider woodland areas simply as a group of trees; there are a multitude of different plants such as bushes, ferns, mosses, other organisms, and rotting leaves in decay. Man has always used the resources produced by woodland areas without worrying about the consequences produced; in particular, entire woodland areas have been depleted when the hunter-gatherer lifestyle was substituted by the agricultural economy. As the resources provided by these areas gradually diminished, the need of preservation arose; through a series of rules which regulate the exploitation of the natural resources without destroying or causing the degradation of these areas, for this reason the cutting of trees has been regulated and the trees are cut considering each single plant and not the area as a whole.

Scientific progress especially in the field of ecology has transformed silviculture into a true scientific discipline, which allows us to proceed in the management of woodland culture scientifically, and not only by observation of the outcome of certain interventions of man.
Silviculture must be considered as a necessary instrument between economic requirements and the ecological respect of woodland areas, keeping well in mind the importance of preserving these woodland areas. Silviculture is not indispensable for the natural growth of woodlands; it is necessary to man to receive certain benefits from woods and forests without damaging them.

Alessandro Ceppatelli is the woodsman; from the CSE archive the photograph of a pubescent oak (*Quercus pubescent*) wood two years after cutting of the trees

Mr. Know-it-all corner

GREAT AND SMALL

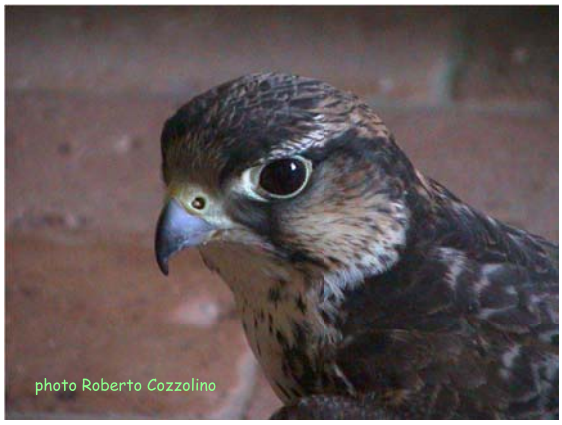
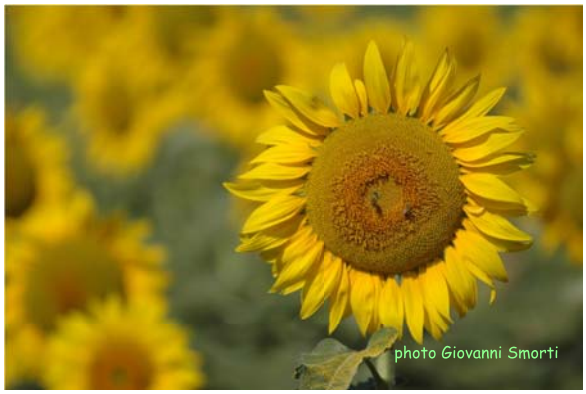


photo Roberto Cozzolino

Hey, look at that hilltop. It's all yellow! Let's go and have a look!
In a clear blue sky, splattered with white specks of paint two hawks fly towards the ground. Sunflowers, hundreds of sunflowers, no nothing interesting for us here, mice and rabbits hide themselves really well amongst those flowers, it's too difficult for us to land there! Anyway there aren't any birds, so let's fly towards those trees! The two hawks elegantly turn around and soar up into the May sky.
Method is vital. Worker AC4356 has been assigned to medium range collection of nectar on the hilltop, the problem is of how to gather the most, how to be sure that all the sources of nectar in the area are visited by this worker, and also that the same flower isn't visited twice; time is not infinite and before nightfall AC4356 must get back to headquarters. AC4356 chooses a strategy consisting of concentric circles, i.e. first around the outside of the field, then a step towards the middle and all the way round again and so forth until the centre of the field is reached. At this point AC4356 will fly back home with all the nectar collected. Other bees are working on other fields; they will all meet up again at sunset.
Are hawks aware of bees? Does the hawk exist for the bee? Does that enormous sunflower field know that it's made up of so many sunflowers? The answers to these questions are neither yes or no; or rather yes and no! Great beings are made up of smaller beings, smaller beings of even smaller entities and so on. The existence of the whole depends on the being of all the smaller parts, but this isn't clear till one day, like a flash of a light this becomes visible to all the little beings, let's see how. Sunflowers are called so because they face the sun and move their stalk all day towards the sun. If the hawks perched on the trees up there hang around enough they will notice that the flowers that were open in the morning facing them will have turned their backs to them. Whereas AC4356 will go round and round in circles on the same flower and its vision will be of one big


photo Giovanni Smorti



circle full of identical nectaries. But at sunset AC4356 will have to turn its back to the sun to make its way home. All day long the busy bee was bent over one flower and didn't notice that the whole field of flowers had turned towards the sun, its vision was concentrated on one flower, but when time to go home arrives the bee will have to look a bit further and orientate itself with the sun if it wants to get back to the beehive. Like this bee, at the end of the day, all the workers with basketfuls of nectar will go towards the beehive on the hilltop, have they made an arrangement? Have they got an appointment? Of course not, but they notice the elongated shadows, the road to the beehive is in the same direction for them all, all of a sudden from separate bees they become a big cloud of buzzing insects moving in the same direction. Can you hear what I can? This nasty buzzing noise is coming from down there. It hasn't been a bad day for the two young hawks, the rabbit was divided equally amongst them and they're now enjoying a peaceful rest on a branch. What's disturbing our proud rapacious friends? It looks like a cloud and it's moving closer by the minute, it seems to be moving exactly in this direction, to this exact tree. The bees are moving towards their beehive, two branches down from where the hawks are resting, the swarm is now big and minatorial. The first painful sting throws the hawks from their branch and makes them fly to their nest, the bees, now a swarm, have entered prepotently into the hawks' experience, and what a painful experience! Again, a little being has grown in number and has suddenly become great and for a moment the bees and the hawks have experienced the same story. If we go back to the morning the bee was in a completely different world with respect to the hawk, the insect flew round and round in a circle, in a field full of flowers; the birds looked peacefully down into a big yellow stretch. The yellow stretch was made up of lots of sunflowers; each single sunflower was made up of lots of central disk flowers contoured by ray flowers. The bee couldn't be aware of being in a field full of sunflowers, the hawks couldn't know that each sunflower contained so many other flowers. Then, at sunset, for a split


photo Roberto Cozzolino

second, all these elements merged into one: small and great were no longer disunited.
This happens all the time and there is a profound reason why great and small remain separated: any slight modification of our body (the death of any tiny cell of our body, a bacterium entering our stomach) produces a consequent chain reaction therefore causing an enormous disaster (cell no. XY678 is dead, and therefore cannot nurture her friends BG789 and KM4567, consequently they will die, but if they die then…) what a disaster! Luckily circumstances are different and even after the death of one single cell everything carries on as before, even though if you look through a microscope so many "disasters" do occur, but the cells are so many that they manage to redistribute their work without too much effort. Only sometimes, but very rarely do cells continue to die… and die… but that's an entirely different story, so let's not go into it. Every now and then the great and the small have to meet, otherwise water would never boil, rain would never fall and so many other important events would never take place.

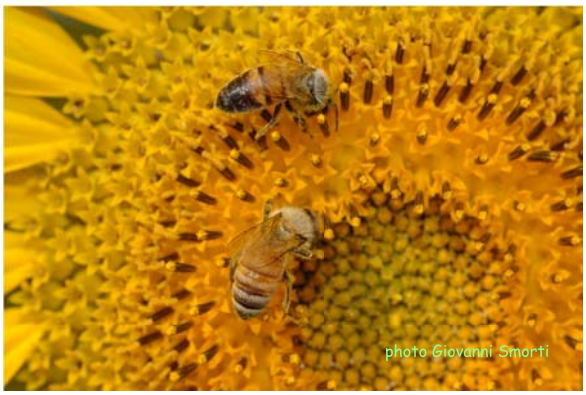


photo Giovanni Smorti

I'm a tiny water molecule in a pan of water, which has just been put on the cooker to boil. I live in this world of little beings; the pan is crammed with molecules like me, every now and then I bump into one: excuse me! I don't' know what I was thinking! Oh, don't worry, how's the missis? Fine, thanks, bye now. Bye. Hi Annina, Evening Mr Giovanni…
Luisa who lives in the "big world" has a completely different vision of the water in the pan, all she sees is a pan of still water. Our worlds are different; hers as a cook and mine in the form of a water molecule. The heat under the pan makes the water hotter and hotter and so my world gets livelier by the minute! All those polite and formal molecules are


photo Giovanni Smorti

transformed into rude and aggressive beings: Hey what's the hurry? Mind my shopping. Keep your hands off! Little riots arise in every corner of the "city". Luisa lifts the lid up and seeing that the water has started to bubble decides it's time to weigh the pasta. Agitation is at its most and the only way to avoid each other is to run in the same direction, it's the only way to get rid of this fire which arises in each one of us, run, run, the sensation is that of being sucked up by a vortex; we are no longer civilized, the only aim is to reach the surface, there the fire inside each one of us is extinguished, and then exhausted we fall back to the bottom of the pan, only to start again. Oh, when will this end? Many of us have evaporated and have flown up into the air, free, free for the first time in all our existence…oh, when will all this end…

Luisa realizes that the water is now boiling, small beings communicate with great beings, the molecules are now organized into vortices, just like the bees that all together fly towards their hive, they turn into a swarm and so the hawks notice them, the same thing happens when the water starts to boil; each molecule instead of moving around separately is transformed into a whirling mass and together all the molecules rise to the surface and then fall back to the bottom of the pan once they have cooled down, and then again and again, forming vortices visible to human eyes. Luisa puts the pasta into the boiling water.

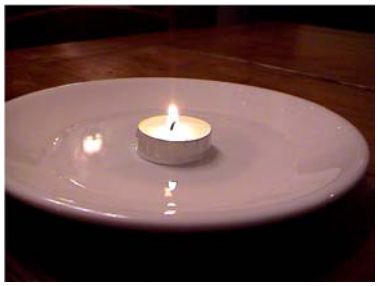
Scientists say that "in presence of a passage of state all the dimensional scales are correlated". This sentence means that when the two worlds, great and small are united an important event takes place, important events such as the passage of a liquid state into gas. We are probably aware of this already and so when we look up into the starry sky or go to the seaside during a storm we "small" beings are touched by a subtle kiss of the "great" and something happens even if we can't explain what it is.

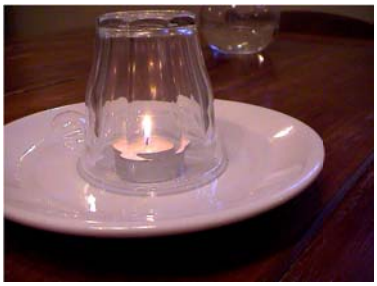
Mr Know-it-all is Alessandro Giuliani, researcher from Rome at the Istituto Superiore della Sanità; Giovanni Smorti took the photos of the sunflowers and of the bees; Roberto Cozzolino took the photograph of the Lanner falcon.

Incredible! But could it be true?

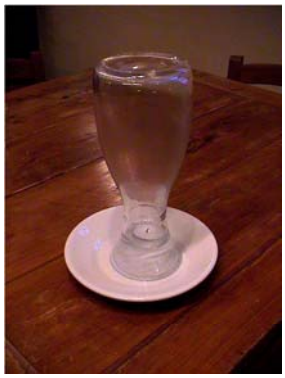
!!!Never attempt this experiment without the presence of an adult!!!

WATER VACUUM

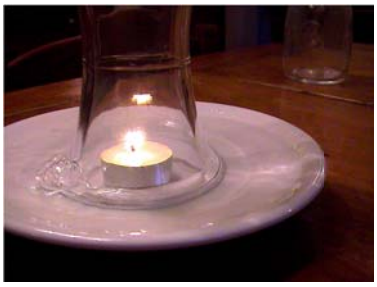


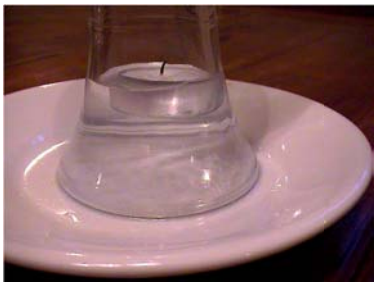


Pour 30 cc of water onto a dinner plate. Place a tea light in the middle of the plate. Light the candle and cover it with a glass, making sure that the glass has a regular edge and therefore adheres perfectly to the plate. After a few seconds the flame will go out and as if by magic the water on the plate will be drawn up under the glass. The burning candle will have consumed all the oxygen underneath the glass therefore creating a depression and consequently a suction of the water on the plate. You can try this experiment with a different sized glass or a jug to see the effect more clearly.

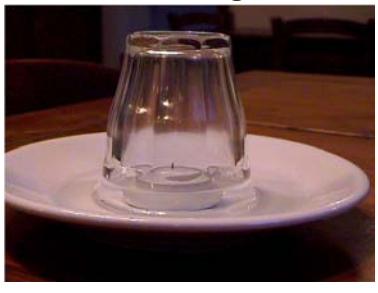


The air we breathe is a mixture of gases. The main gases are nitrogen (78%), oxygen (20%), then we have rare gases such as helium, argon, neon, krypton, xenon, radon, smaller quantities of ozone, water vapour and 0,03% of carbon dioxide. When a candle burns (combustion), the oxygen present inside the glass and the combustible substance in the paraffin with which the candle is made of (carbon + hydrogen) produce a reaction and therefore we obtain water and carbon dioxide. The carbon dioxide will dissolve in the water and in its liquid form will occupy 1 part of a thousand of the space it would have occupied in its gaseous form; this is how we can explain the empty volume inside the glass. In fact the quantity of water found inside the glass corresponds to about 20% of the oxygen present in the air underneath the glass, which consumed during the process of burning.





Roberto Cozzolino demonstrated this experiment with the assistance of Professor Dante Cordischi



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Free electronic newsletter for children

contributors for this issue :
Alessandro Ceppatelli, Roberto Cozzolino, Dante Cordischi,
Alexandra Gelpke, Alessandro Giuliani, Giovanni Smorti

English version: Isabella Colopi

Centro Studi Etologici cultural association
Convento dell'Osservanza
53030 Radicondoli (Siena) Italy
http://www.centrostudietologici.it