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The Olympics in the Olympiad

The atmosphere at year's Olympiad is clearly competitive. The participants are challenged to represent their countries on more occasions than at the official exams only. After the game of living Stratego at Bourtange, the students could prove themselves yesterday at the Mega Olympic Games. The Break Out team had organized a sports afternoon near Harkstede, with all kind of typical Dutch games. Although, Dutch ... Sumo wrestling surely is a Japanese sport, isn't it? Now and then the activities were interrupted by an — also typically Dutch — shower, but this did not deter the participants.
"Those Dutch games are crazy!" said one rather dumbfounded student. At the start of each new game, the students remain on the fence but when the biggest daredevils made an effort after the game was explained to them, the others soon

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A sack race is not an easy thing when there's two to a sack...

Paul Crutzen: guardian of the biosphere's Achilles heel

The last Dutchman to receive the Nobel Prize for Chemistry was Paul Crutzen. In 1995, he shared the prize with Americans Mario Molina and Sherwood Rowland "for their work in atmospheric chemistry, particularly concerning the formation and decomposition of ozone," as the Nobel Prize Committee put it.

Solar rays contain much hard ultraviolet (UV-B) rays that are harmful to life on earth. The first lifeforms — anaerobic microorganisms — therefore emerged three billion years ago in the ocean, at a safe depth of around ten meters. One of the waste products of this life was oxygen. Once in the atmosphere, part of this oxygen was converted to ozone (O3) under the influence of solar rays. This gas absorbed the harmful UV-B radiation and thus created an essential condition for the future development of life on earth.

O_2 + UV radiation -> 2O
$O + O_2 + M \rightarrow O_3 + M$

where M is a random air molecule (N2 or O2).

Only a small amount of ozone in the atmosphere protects us against harmful radiation these days. If all the ozone in the atmosphere were compressed to a pressure corresponding to that at the earth's surface, this layer would be only 3 mm thick.

Much lower

In 1930, British physicist Sidney Chapman was the first to describe how sunlight causes the transformation of one form of oxygen to another. He also explained why the highest ozone concentration occurs in the layer between 15 and 50 km, the ozone layer.

See next page >>

Prof. Paul Crutzen

三十四目の化学オリンピックはそろそろ終わってしまいますが、
経験が面白かったのを祈っています…

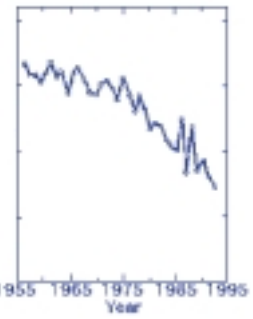
>> Crutzen

However, his description did not completely correspond with subsequent measurements, which indicated a much lower concentration of ozone than Chapman had predicted. In 1970, Dutchman Paul Crutzen proposed an explanation for these lower values. He showed that the nitrogen oxides NO and NO_2 react catalytically with ozone, thus accelerating the rate of reduction of the ozone content.

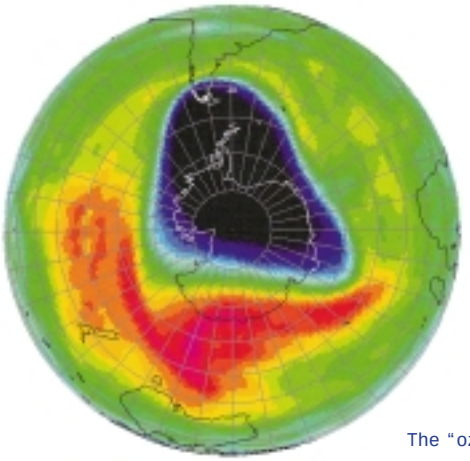
$NO + O_3 \rightarrow NO_2 + O_2$
$O_3 + \text{UV light} \rightarrow O_2 + O$
$NO_2 + O \rightarrow NO + O_2$

Net result: $2O_3 \rightarrow 3O_3$

The role of the nitrogen oxides also connected the biological processes at the earth's surface with atmospheric processes, since these nitrogen oxides originate from microbiological transformations at ground level.
In 1974, this relationship led Americans Mario Molina and Sherwood Rowland to publish their idea that chlorine originating from chlorofluoro-carbon (CFC) gases could also break down ozone, in the same way as NO. The difference is that more than 90% of the NO is natural, while atmospheric chlorine is almost exclusively of man-made origin. These CFC gases were used in spray bottles, as a cooling medium in refrigerators, in plastic foams, and elsewhere.
In the years that followed, the question whether mankind would be capable of depleting the highly important ozone layer was hotly debated. The real shock came in 1985, when Joseph Farman and two colleagues noted a drastic depletion of the ozone layer over the Antarctic, the "ozone hole." Crutzen was one of the main contributors to the explanation of this phenomenon; later, he also helped to explain the role of ozone as a greenhouse gas at lower altitudes in the atmosphere.

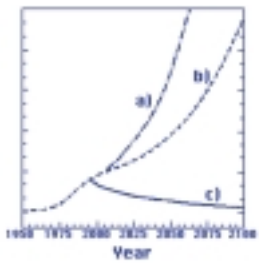


Thickness of the ozone layer (mean monthly value for October) over Halley Bay, Antarctica. Note the drastic depletion since the end of the 1970s.Source: The NOBEL *e*-MUSEUM.



The "ozone hole" in october 2000

Partly as a result of agreements (the Montreal Protocol) signed in 1987 and 1996 under the auspices of the United Nations, the most dangerous gases will be totally banned. It is expected that the depletion of the ozone layer will come to a halt and that this vulnerable solar shield may even be restored. However, this may take as long as a hundred years.



Change in the chlorine content in the stratosphere up to the present and three different future cenarios: a) Without restrictions on release, b) Limitations according to the original Montreal Protocol of 1987 c) The release limitations now internationally agreed. (Chlorine content is a measure of the magnitude of ozone depletion.) Source: The NOBEL *e*-MUSEUM.

Tomorrow's program

Saturday 13 July 2002

MENTORS / SCIENTIFIC OBSERVERS		STUDENTS		GUESTS	
08:00	Breakfast at hotel	*10:30*	Brunch at hotel	*08:00*	Breakfast at hotel
09.00-13.00	Free time for shopping and lunch	*12:00*	Departure for Groningen: Free time for shopping	*09.00-13.00*	Free time for shopping and lunch
16:00	Closing Ceremony at Martini Plaza Theater	*14:45*	Departure for Martini Plaza	*16:00*	Closing Ceremony at Martini Plaza
		15:00	Rehearsal for the Closing Ceremony		
18:00	Aperitif at Martini Plaza	*16:00*	Closing Ceremony	*18:00*	Aperitif at Martini Plaza
19:00	Closing Dinner at Martini Plaza	*18:00*	Aperitif	*19:00*	Closing Dinner at Martini Plaza
		19:00	Closing Dinner		
21.00-24.00	Party	*21.00-24.00*	Party	*21.00-24.00*	Party

followed. “We’re gonna win!” was a muchheard cry, for example during the blind volleyball game. Initially, many wondered how you could possibly play volleyball blindfolded. The game is based on a similar game in which the net has been replaced by a piece of fabric, so that the players do not see what the opposing team is doing when they have the ball. These games therefore require uncanny reflexes. Unfortunately, not everyone could win: “Though we lose all the time, it’s great fun,” said Arjun from India.
The eight best teams had to compete with each other in a tug of war. Finally, the combined team of Ireland, Belgium and Switzerland finished first with 41 points and was awarded a tasty cream cake. All this effort made the students very hungry. Fortunately, the barbecues were already hot enough to receive the sausages, hamburgers, and skewers to be consumed by the students.

Many thanks to the Break Out team!

“Grab my hand!” “Yeah, I got the rope!” Through good team effort, even the highest slippery slop can be overcome.

“We very much liked the sliding with a round tube off a ramp.” The team of France and Rumania set a record of 37 slides in 7 minutes, performed by 7 people.

Hitting the target is difficult when you have to use such a big bow. Still, most students scored points in this game too.

“Please, can you give me my helmet, I really can’t move in this suit?!”

Six reasons to be here

- To solve stupid problems!!
- Good question... – Toby (UK)
- Nice question to think upon. For fun, what else (Ha! Ha! Ha!) – Sumit (India)
- If you won a free trip to Holland, wouldn’t you go? – Martin (UK)
- These days are brilliant holidays, but during the tests I thought I was brought into wrong plane (or train), like, perhaps, others. But we all are in the “same ship.” – Paulius (Lithuania)
- For the pretty women – a Cypriot student

Skûtsjesilen

The Frisian Skûtsje is a sailing vessel with an extremely shallow draught and no keel. This is why the vessel lies more on than in the water and can even be used when the water is not very deep. In the old days, these ships were used to transport a variety of goods. Today, they are being raced. Because they have no keel, they would soon go “skating” across the water when the main sail picks up a bit of wind. This problem has been solved by mounting two leeboards on each side of the vessel that can be lowered and raised into the water. Like a genuine keel, these leeboards ensure that the ship cannot move sideways, but they do not increase the draught as they can be raised.

Stiff wind

The mentors, observers, and guests have sailed in comfortable weather on several Skûtsjes for two hours. The stiff wind gave the ships more than decent speed; even the professional sailors among the passengers agreed that it had been excellent sailing weather!

The mentors have had sufficient fresh air to get them ready for their final job: joining battle to ensure optimum scores for the students in their teams.

Private study for Saturday

To make an absolute success of the final party on Saturday, it would be nice if everyone could study the — Dutch — song printed below. The pronunciation is, of course, somewhat difficult to explain on paper, but you will soon get the hang of it at the party...

Some private study is certainly worthwhile; after all, this is a tune written by the by now legendary Dutch composer Herman Boek:

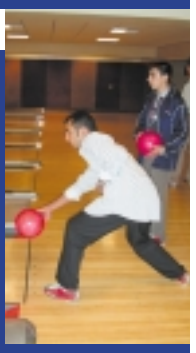
Trap nooit zo maar tegen een eend, want een eend is ook iemand zijn moeder
Hij zwemt in een sloot of in een plas,
of ergens anders waar het nat was

Nu denkt u misschien dit is het eind,
dat is het ook.

Experiencing the nightlife of Groningen

Wednesday night the Olympians have prowled the city center of Groningen in droves. The flipchart near the dining room called on all students to come in lab coat and goggles. Some indeed rose to occasion and did so... Although going out was a new experience for some, most participants enjoyed themselves tremendously. They were taken to the bowling alley, where the scores of the various countries were recorded carefully. In the end, the Byelorussian team were the winners, with 137 points in 10 throws. The contestants could let their hair down in various pubs and forget all about the theoretical exam. Drinks in front of them, they could either choose to go dancing or simply lounge away the evening. The festivities came to a terrific close in discotheque The Palace.

Live music in Irish pub Sally's



The real bowling move

Conga at "De Drie Gezusters" café

Everyone goes crazy on the Palace dance floor

In the limelight: Dutch mentors

For the Dutch team, the 34th IChO is a special experience in the sense that they do not have to go abroad to participate. This also means that the trips they are going on take place in their own country, which — if all is well — they already know like the back of their hand. Even more extreme: mentor Johan Broens's cottage at 't Wiid is only 6 km from his own home, which means he knows the neighborhood intimately. We have asked him and Emiel de Kleijn for a reaction...

They both agree that it does not make a big difference whether you go abroad or not for the IChO. They are still isolated, now in a holiday park, and they are still surrounded by many foreigners. In the evening they join the Belgian delegation in the cottage to muse over the events of the day. So, it is still a unique experience. A cottage also works much better than a hotel room when it comes to making contacts with the other mentors. And as far as the trips go, they both had never been on a skûtsje before, so that was a very impressive experience. The route, incidentally, was the same one as Johan often sails in his own cabin cruiser.

Not only the cottages and the trips receive their highest praise; the food has been excellent and always served in very special restaurants situated in interesting places. Great care must have gone into their selection, they believe. Finally, they are extremely grateful to their guide Shing Yu Ng for all her efforts. As far as they are concerned, she is the brightest star at the organization's firmament.

Did you know that...

- The guide of China has brought six swimming trunks.
- The prediction made by the guide of Byelorussia (Catalyzer 7) has already been surpassed because the team won four gold medals with bowling.
- The Australians can't be trusted, but they do know interesting Did-you-know-thats. For example, the following warning: "Watch out for imitation Polish people, you can tell by the way they can't hold their beer."
- Icelandic scientists have made groundbreaking progress in organic insulators, thereby enabling Erlandur to survive the bitter 4 a.m. cold with just a T-shirt and a vodka.
- Some of us have been treated to the pleasure of non-stop Azerbaijani music on bus no. 6. But now you can all see a dancing showcase extraordinary. Be there on the last evening!

Finnish student

THURSDAY 11 JULY: Yesterday we reported that Finnish student P. Valkama had suffered an allergic reaction in combination with an asthma attack. Unfortunately, his condition has not improved and he was forced to return to Finland this morning.

A real dessert

THURSDAY 11 JULY: Many students had already asked for it and yesterday they finally got what they wanted: they were treated to a real dessert. Although the idea was to put yoghurt and custard on the table, "kwark" (a kind of cream cheese) was what they got. A delicious alternative.

From the flipchart

- I forgot the recipe for acetone peroxide. Does anyone know it? 1 part $(CH_3)2CO$; 2 parts H_2O_2; acid (for pH, HCl or H_2SO_4 or....) => white stuff

Balance the following equations:

- a $Pb(N_3)_2$ + b $Cr(MnO_4)_2$ —> c Pb_3O_4 + d Cr_2O_3 + e MnO_2 + f NO – Dimitar (Bulgaria)
- a $\{Cr[CO(NH_2)_2]_6\}_4[Cr(CN)_6]_3$ + b HNO_3 + c $KMnO_4$ —> d $K_2Cr_2O_7$ + e CO_2 + f N_2 + g H_2O + h $Mn(NO_3)_2$ + i KNO_3
  The Catalyzer reporters have already received a solution from Croatia. Who's next?
- WO_4^- + Cl_2 + C —> WC + $COCl_2$

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