40 Hu 08

40th International Chemistry Olympiad

2008 Budapest, Hungary

Catalyzer

Issue No. 1 – Sunday 22 July 2007

Welcoming message of George A. Oláh

It is my pleasure to invite you to the 40th International Chemistry Olympiad to be held in Budapest, in the city where my scientific career had started.

Hungary has a long tradition of academic competitions, dating back to the 19th century. As one of the three founding countries, it will host the Chemistry Olympiad once again, 40 years after the first event.

Being a friendly competition for secondary school students, the Olympiad motivates and educates the best students of more than 70 nations. There are only a few meetings in Chemistry that have such a wide participation reaching almost to the 80 percent of the population of the globe.

Chemistry has a wide array of unexplored and challenging problems to be solved by a new generation of chemists. I hope that the Olympiad will become an important starting point in the career of the participants towards Chemistry.

Oláh A. György

Nobel Laureate in Chemistry, 1994

Distinguished Professor of Organic Chemistry, University of Southern California

Welcoming message of the Chairman

Dear Friends,

I am really pleased to invite you to Budapest on the occasion of the 40th International Chemistry Olympiad. It is the fourth time that Hungary hosts this prestigious event and being a veteran IChO organizer I remember well the 3rd Olympiad, which was held at the Eötvös Loránd University. Looking back to these first steps of the chemistry olympiad movement, they started as local, friendly get-together parties in chemistry. Since that time IChO's have become professionally organized, world-wide events gaining considerable international reputation. Enlargement frequently results in loss of quality but not in this case because these events are dominated by such basic values as the respect of science and education, clear and fair atmosphere of the competitions with all of these glued together by friendship and goodwill.

So come and try your professional skills in the course of the competitions, come and enjoy Hungary!
In other words: "Gaudeamus igitur..."

Szepes László

Chairman of the 40th IChO

Deputy Director of Education of the Institute of Chemistry, Eötvös Loránd University

Issue No. 1 – Sunday 22 July 2007

Hungary

Hungary lies landlocked in Central Europe. The area of the country is a mere 93 thousand square kilometres and out of its 10 million inhabitants almost one fifth lives in the capital Budapest, located in the middle of the country. The great rivers Duna (or Danube) and Tisza cross the terrain in north-south direction dividing it into three parts. The western is scattered with hills while the eastern is ruled by vast plains called the Puszta, perfect for agricultural use. Though surrounded by a range of mountains in the neighbouring countries, the highest point of Hungary called Kékes is only 1014 metres above sea level. Nearby lies the wine area Tokaj famous for its sweet dessert wine Aszú, said to be wine of the kings and king of the wines. Due to the enclosedness also hundreds of plant and animal species live uniquely in the basin. In order to protect this diversity 10 national parks and numerous nature reservation areas have been established all over the country. As you will see, the greatest lake is Balaton, a popular destination point for both Hungarian people and tourists, along with the largest thermal lake in the world, Hévíz, where the hot water emerges naturally from the ground.

Hungarians

Hungarian people originate from somewhere near the Ural Mountains according to the prevailing theory based on the fact that their language belongs to the Finno-Ugric family. The settlement in the Carpathian Basin is dated to the year 896 AD, in the age of the Great Migrations, at which time chiefs lead the people. In 1000 AD was the first king Saint István (Stephen) crowned. The Christian state he had established remained a kingdom until 1946. The original crown has a rather peculiar story being lost and found but now it is on display in the Parliament Building, which is one of the symbols of Budapest and is a destination of all sightseeing tours around the city. The history of Hungary is characterized by a constant struggle between East and West, many battles, invasions and reconstructions, but in 1989 it was finally declared a Republic.

Culture

Hungarian, the only official language belongs to the same family as Finnish and Estonian. Some say it is one of the hardest languages to learn being an agglutinating one. Cuisine is also a prominent part of the national culture, which usually splits the visitors since it is quite spicy and includes a lot of meat dishes. These are traditionally flavoured with red paprika, maybe the most famous of them being the gulyás (or goulash) soup. Hungarian musical life has always been ranked high with many acclaimed composers and performers (just to name Bartók and Liszt). The literature has just recently gained some renown outside the borders, e.g. Kertész Imre was Nobel Prize winner in 2002. (note that in Hungarian the first name is written second). The country is also proud of the achievements of Hungarian scientists: Neumann János (John von Neumann), Szent-Györgyi Albert, Teller Ede (Edward Teller) to name a few.

Budapest

Budapest, the beautiful capital of Hungary is by far the biggest city in the country with its population of 1.8 million people. It is divided by the Danube into two parts, hills rising on the right-hand side, featuring numerous caves and hot springs in the heart of the city, while the left-hand side is almost flat. A total of 9 bridges arc over the river that also embraces two big islands. Margaret Island (formerly called Island of Rabbits) is a popular place among local people. The foundation of the northwestern area dates back to the Roman Empire, at that time called Aquincum, but the first castle was only built in 1247 on Castle Hill and its present form was finished in 1903. There are many sights in Budapest, some of them are the Buda Castle, the Parliament Building, St. István's Cathedral, the Opera, the Millennium Monument on Heroes' Square and its surroundings, which were constructed in 1896 for the anniversary of the settlement. Though traffic is not the strongest point of the city, the public transport is really convenient with three underground metro lines, trams and buses.

ELTE

The 40th IChO will be organized at the Eötvös Loránd University (Hungarian acronym: ELTE), the oldest and largest institution of higher education in Hungary. The university is sometimes also referred to as the University of Budapest although there are more than ten universities in town.

The University was founded in 1635. It has functioned as The Royal Hungarian University most of the time. The present name (after the experimental physicist and statesman baron Eötvös Loránd) was introduced in 1950, when the faculties had been reorganized. The first Department of Chemistry was formed in 1770 at the University. The present Institute has close to 80 faculty members and a similar number of PhD students.

The Faculty of Sciences moved to a new campus on the west bank of the Danube, slightly south of the city center in the last decade. This will be the venue of most of the events of the Olympiad with its classrooms, conference center and computing facilities. Laboratory space will be used in the Institutes of Chemistry and Biology. The campus is easily reached from downtown and from the hotel used by the mentors on public transport or even on foot. We plan to provide a transit pass to the participants accommodated in Budapest.

Students' accommodation

The students and guides will stay in the dormitory of the University of Gödöllő, a town about half an hour's drive from Budapest. The newly built buildings are close to the 150 year old main building of the university and its wonderful gardens. With lots of greenery, the place radiates a tranquil atmosphere. Besides the rooms there are common halls for evening programs and fields for those who would like to enjoy some sporting activities.

Mentors' and guests' accommodation

Congress Park Hotel Flamenco is centrally located first class (four star) hotel in the heart of the city with 358 fully equipped, air-conditioned rooms. The building is overlooking a beautiful park with a small lake and is surrounded by the scenic hillsides of southern Buda.

Pictures are a courtesy of Magyar Turizmus Zrt. Fotógaléria

40th IChO tentative program

Date		Students	Mentors and observers	Guests
July 12th Saturday	Whole day	Arrivals and registration		
July 13th Sunday	Morning	Opening Ceremony and Welcome Reception (ELTE)		
	Afternoon	Lab safety instruction	Lab inspection (ELTE)	Excursion
	Evening	Excursion	1st Jury meeting + translation	Free time
July 14th Monday	Whole day	Excursion	Translation	Excursion
July 15th Tuesday	Morning	Practical exam	Discussion on theoretical exam 2nd jury meeting	Excursion
	Afternoon	Excursion	Discussion on theoretical exam 2nd jury meeting	Excursion
July 16th Wednesday	Whole day	Excursion	Translation	Excursion
July 17th Thursday	Morning	Theoretical exam	Excursion	Excursion
	Afternoon	Free time	Excursion	Excursion
	Evening	Re-union party		
July 18th Friday	Whole day	Whole day excursion		
	Evening		3rd jury meeting	
July 19th Saturday	Whole day	Excursion	Arbitration	Excursion
July 20th Sunday	Morning	Free time		
	Afternoon	Closing ceremony		
	Evening	Banquet		
July 21st Monday	Whole day	Departures		

A few practical issues

The weather is usually hot and dry in the summer (though thunderstorms and sometimes colder days are also possible) with an average of 28°C.

Hungary is a member of the European Union. By mid 2008 it will be a part of the common visa (Schengen) policy. That means that many of the participants can enter the country visa-free. Others will have to apply for the unified EU visa with our full assistance.

The currency in Hungary will still be the forint in 2008. The euro is not official and is not widely accepted in daily use, but currency exchange from most major currencies is facile.

Local time in Budapest is GMT+1, in accord with most of Western Europe. Electric appliances operate on 220 V/50 Hz, with European standard two-pronged plugs.

Useful Hungarian phrases

Hi	Szia
Yes/No	Igen/Nem
Thank you	Köszönöm
Sorry	Bocsánat
I am lost	Eltévedtem
It's too expensive	Drága
I don't understand	Nem értem
Test tube stand	Kémcsőállvány
My lab coat is burning!	Ég a köpenyem!
The hood has exploded!	Felrobbant a fülke!
You are beautiful	Szép vagy
I'll take a stew	Kérek egy pörköltet

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Catalyzer

Anniversary Issue – Saturday 12 July 2007

The problems of the first Olympiad

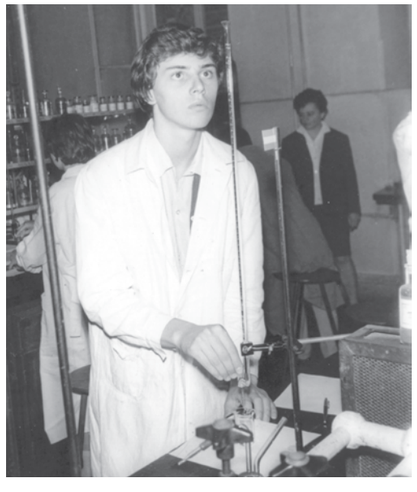
Problem 1
A mixture of hydrogen and chlorine is irradiated with scattered light in a closed vessel. After some time, the amount of chlorine decreased by 20% compared with the initial quantity at the same temperature. The resulting mixture has the following composition: 60% chlorine, 10% hydrogen and 30% hydrogen chloride by volume.
1. What was the original composition of the gas mixture?
2. How are chlorine, hydrogen and hydrogen produced?

Problem 2
Give balanced reaction equations for the following processes:
a. Oxidation of chromium (III) chloride with bromine in alkaline (KOH) solution.
b. Oxidation of potassium nitrite with potassium permanganate in acid (H_2SO_4) solution.
c. The action of chlorine on lime water ($Ca(OH)_2$) in a cold reaction mixture.

Problem 3
The gas that comes from a blast furnace has the following composition:
CO_2 12.0% vol, H_2 3.0%, 0.2% C_2H_4, CO 28.0%, CH_4 0.6 %, N_2 56.2%

a. Calculate the volume of air (m^3) required for a complete combustion of 200 m^3 of the exhaust gas (at the same temperature and pressure measured, the oxygen content in air is 20% by volume).
b. Determine the composition of the products if the gas is burned in a 20% excess of air.

Problem 4
The vapor of an organic acid has a density 30 times of hydrogen. For the neutralization of 0.19 g of this acid 31.7 ml 0.1 M sodium hydroxide is consumed. Give the name and structural formula of the acid.



Colophon

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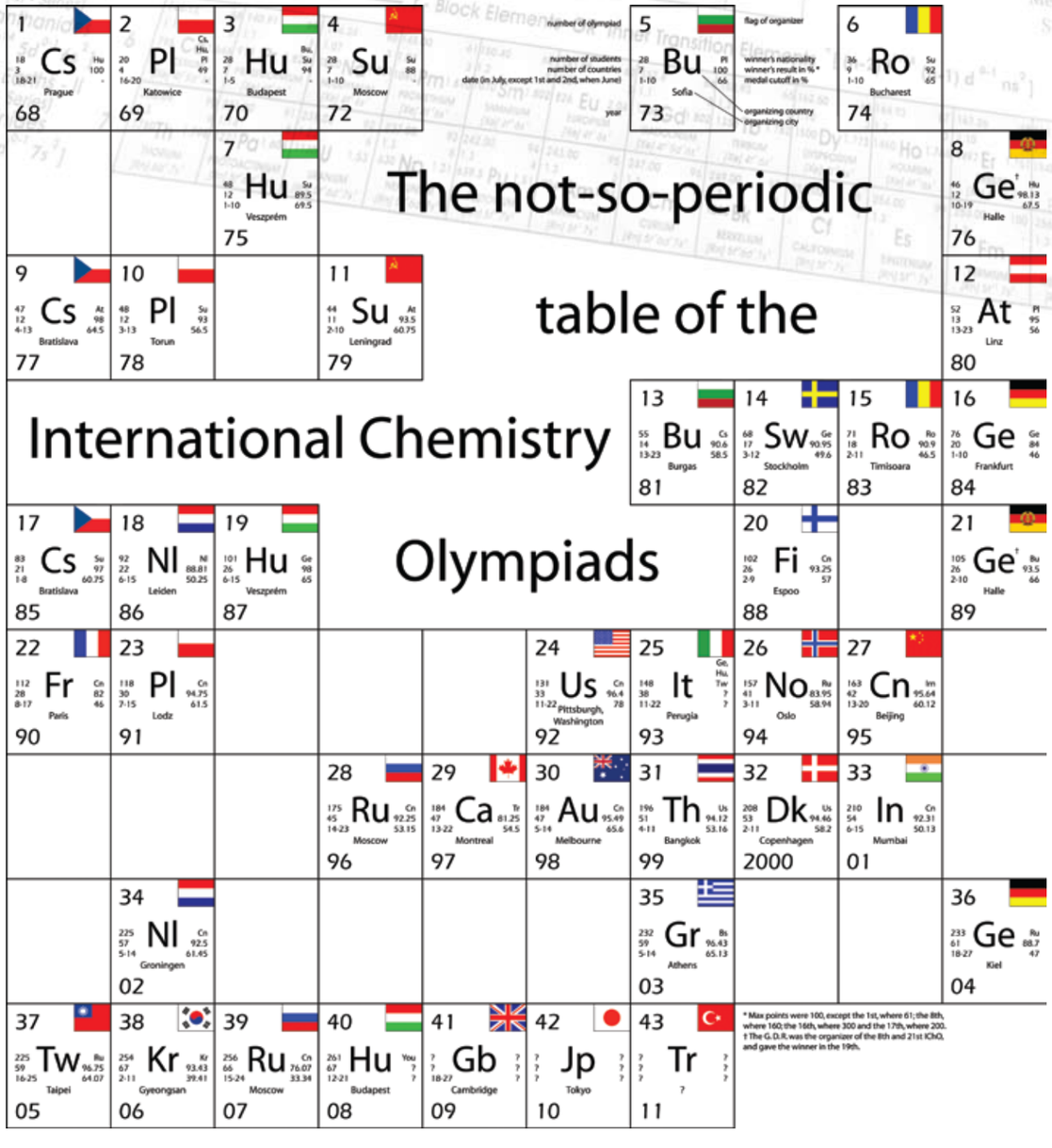

* Max points were 100, except the 1st, where 61; the 8th, where 160; the 16th, where 300 and the 17th, where 200.
† The G.D.R. was the organizer of the 8th and 21st IChO, and gave the winner in the 19th.

An insight on history – Dr. Fuggerth Endre, the member of the first team

Fuggerth Endre, one of the six members of the Hungarian team at the first Chemistry Olympiad (1968) in Prague was born in Budapest in 1951. His attraction toward sciences began early, but was given direction, as well as momentum, when he "borrowed" and read the chemical textbooks his brother – older by six years – was studying for his exams. Enthused by their content, the youngster put every penny he had into building a home laboratory – causing serious concern to his parents – and performed numerous experiments that gave him a sure hand later in practice. Despite his passion for chemistry, he opted to study Mathematics in Fazekas Mihály secondary school (which had a very high reputation at its level). "Mathematics is the key to logic, and without impeccable logic no science (or scientist) is worth the name", he professes. Time unconsumed by Mathematics was poured into reading about any kind of chemistry whatsoever, limited only by the language barrier of Hungarian. With such a background, the road to Prague for him now seemed inevitable, yet there was a stumbling block. Training problems sent by the Czechoslovakian organizers did not differentiate between the competitors as they needed only simple calculations done quickly. Back in 1968, the slide-rule was the fastest tool available, yet – although dexterity at it can be laudable – it has nothing to do with either mathematics or chemistry. So it happened that he ranked 7th, just out of the team, when a chance came. Each potential team member was given the opportunity to lecture on whatever topic he liked, and Fuggerth accepted the challenge – and won. He went on, oblivious to his audience, reciting and explaining great parts of organic chemistry to the astonishment of the teacher present until he was stopped, and given a place in the team. It was thus no surprise that at university he specialized in organic chemistry and made his MS thesis in 1975 in this field. The topic he chose involved both spectroscopic and chromatographic methods. The latter subject

being in extreme flux at that time, he decided to part for a while from organic chemistry to devote some time to a relatively new science in its infancy. HPLC acted on him like magnet, and taught him special skills. Although its grip later slackened, the embrace of chromatography still remained. He has now left science and is living in a rural village, spending his time improving the house he lives in and creating an orchard containing the widest range of fruits possible at this latitude.

Q: Dr. Fuggerth, why chemistry?
A: Circumstances, as always, played a role. I remember my father, a man without higher education but endowed with talent and skill, having subscribed to a monthly periodical titled "Univerzum" that contained original papers translated into Hungarian from every branch of science, including contemporary results. I perused that periodical heavily as a child. The breakthrough in favour of chemistry came when I found the textbooks my older brother was using in his high school and faced their breath-taking, unfathomable content. The die was cast.

Q: Do you have favourite problems or fields in chemistry?
A: Let me just think. I always found it very interesting to look into the remarkable chemical composition of the Earth which renders it unique among the other planets (in our solar system). If you compare Earth to the other planets, its diversity and kaleidoscopic nature strikes you at once. One may then ask if all this can be connected in some way to the origin of life.

Q: What has been the most important chemical discovery of the last few decades in your opinion?
A.: Novelties are twelve a dozen, yet giant achievements are rare and are usually recognized and given the place they deserve only when looking back from quite a distance; sorry, but such is human nature. H. C. Brown, who discovered and developed organo-boranes, a chemistry in itself, immensely useful tools in synthetic organic chemistry, surpassing even the highly regarded Grignard's reagents, received his Nobel prize some ten years later; a fate very similar to our own Oláh György. Ancillary techniques seem to deserve even lesser attention: a remark and a few equations uttered by an old physicist almost informally at a Ljubljana conference could be traced back as the origin of 2D NMR spectroscopy, now an unprecedentedly useful tool.

Q: And what has been your most important discovery?
A: I regard myself as lucky to have been faced with an intellectual challenge in 1982, which, doggedly tracked for five years, resulted in what was subsequently called Zone Gas Chromatography, an approach that later opened the door to Multidimensional Gas Chromatography.

Q: What was the Olympiad like? Was it difficult to win?
A: Actually it was more difficult to get into the team. (This has been touched on earlier, in the introductory part.) In Prague the problems had fortunately more colour and diversity, with the experimental part clearly being an overshot. A pardonable fault of the organizing committee, this being the very first Olympiad. By then I had at long last obtained a proper grip on the plethora of accumulated knowledge in my mind, and solutions came smoothly, and with mirth.

Q: Did you follow the life of the other members of the team?
A: In fact, no. Only one of the remaining five chose chemistry as a profession. His name is Deli János, we attended the same class at university, and we made a lasting friendship.

Q: Do you think it is possible to pose theoretical chemical tasks based on real life problems for such competitions which can differentiate between students?
A: I am rather sceptical. Chemistry does not work with imagination alone, even if it is the brightest. Those who know more facts are in a much better position at the start. At the same time, accumulating facts never has an end, not to mention that secondary schools have their other functions at an age when such a task is rather unusual even to begin with. So, diligence and devotion are easier to measure than to single out talent. This is especially true if reasoning is curbed, a list of standardized answers is offered, and if the problem posed allows only a single approach in solving it. The students will do their best in any event. Life, and real – at times testing – problems come later.

Q: One can contrast science Olympiads with sport Olympic Games in several aspects. One such aspect is the recognition of the participants: youngsters competing in sport are far more recognized, and celebrated, than those participating in science Olympiads. How do you see this difference?
A: The contrast is too wide, indeed. The responsibility for change lies with the media. There would be a favourable shift, both culturally and socially, if instead of false heroes gifted youngsters living among us were given more publicity. It would be more human, more elevating for the aimless and would cost very little. Furthermore, talented people would have less chance of losing their way in society.

Q: Why do you think the majority of the people dislike chemistry nowadays?
A: First of all I am not sure it is true. Nevertheless I see two problems here. One is that people in general do not acknowledge that principles of chemistry in fact govern a lot of aspects of our everyday life, and what's more, they do not respect them. See for example the careless usage of fireworks and crackers at feasts, the widespread abuse of drugs, the blind-eyed acceptance of chemical modifications in the food industry, to mention but a few. Teachers should be given the opportunity to explain relevant concepts at their students' level to clear the mist, thus eradicating the serious consequences that are now so prevailing. The other problem is an overall negative attitude towards chemistry, mainly because it is widely believed that "chemicals" cause pollution. Cardinal is the point that this picture is false. It is industry that pollutes, transportation and energy consumption contribute even more, and all because of mankind's supposed increasing needs. Are they really justified?

Q: With hindsight, would you follow the same career or would you choose something different?
A: I can't help feeling that something in my genes "encoded" me for chemistry. So, a second start, although it may differ at the outset and lead to a less tortuous career, would certainly land me somewhere in chemistry. However, should it happen nowadays, I would need a scrutinizing eye, too, open to perceive and address changes: environmental issues, abuse of science by industry, justification of research priorities, etc. This should also be a task for those who are still active and in a position to influence events.

(Stirling András)

Father of the Olympiad – interview with Székely György

Székely György was the mentor of the Hungarian team at the first Chemistry Olympiads and he was also one of the founders of this global meeting. He started his carrier as a highschool chemistry teacher. Later he was promoted and obtained a position in the Educational Ministry where he was responsible for the chemistry curriculum and education. After 21 years he retired, but he remained active for 17 years. During this period, at age 70 he dedicated himself to his other favourite field, namely literature: he has translated various German and French poems to Hungarian, including such famous authors as Heine, Goethe, Baudelaire and Verlaine. His translations appeared both in literature journals and schoolbooks. He is now a happy great-grand father of his great-grand children. We talked with him about the beginnings in the Chemistry Olympiad at his home.

Q: Mr. Székely, can you tell us about how this whole wonderful series of Chemistry Olympiad started?
A: It has been long ago, in 1968. It was inspired by the success of the Mathematical Olympiad started in 1959 and that of the physics started just a year earlier. In the spring of '68 we had received an invitation letter from the Czechoslovakian Ministry of Education in which they had proposed to organize a similar Olympiad for chemistry and in May we had a pleasant meeting in Ostrava, where 3 Czechoslovakian and 3 Polish colleagues participated, and I represented Hungary. We agreed on some of the most important issues: 6 participants from each country, no official ranking at the first three events, there would be theory and experimental parts, the problems are given by the host country, and that the host country prepares and sends out preliminary problems similar to the competition tasks.

Q: Do you remember your fellow colleagues from the other countries?
A: Yes, I can easily recall some of them. Tymoteusz Szarszaniewicz, an enthusiastic chemistry teacher from Poland made a long lasting impression on me. Also, the Czechoslovakian organizer, Mr. Novotny from the Charles University was a nice colleague and friend. I also recall the amazing beauty of the directress of the pioneer house in Prague where the experimental part of the competition took place – said Mr. Székely smiling.

Q: And some Hungarian colleagues from the initial years?
A: Certainly. Two colleagues from the Eotvos University: Dr. Hartmann Hildegard, Dr Szepes László, the late Davida Leóné and Dr Várnai György were all key persons in the competitions.

Q: How did you select which countries were invited?
A: The selection of countries fell entirely within the host country's competence. As far as I remember Hungary who organized the third competition, decided to invite European non-socialist countries, and later the USA and Cuba as well. However they did not come at that time yet.

Q: Were there any language problems?
A: At the beginning the host country translated the problems to all the languages of the invited countries. Since the number of the participating countries was not much, it was feasible. Nevertheless the final translated version was always written by the mentors of the given country. We also managed this problem in the first years when we, i.e. Hungary hosted the Olympiad. However, later this policy has changed.

Q: Nowadays media coverage is inevitable. 40 years ago, in a socialist country, this was different. How did you do it at that time?
A: During the Olympiads, I had very frequent contact with a correspondent of the national news agency (MTI) and they usually issued a short report.

Q: While the media coverage of sport events is taken granted naturally and of course strongly demanded, the same is not true for science competitions. What is your opinion?
A: I do not think that the two types of competition would be comparable. There are very fundamental reasons why the sport events are covered much more profoundly. First of all sport events by nature are much more popular and people are much more interested in them. People understand sport and often do it themselves. They like sport but do not like and understand science.

Q: Why do people not like chemistry?
A: People here in Hungary do not like chemistry for a couple of reasons. Chemistry as a separate subject in education has been introduced relatively later into the curricula. Its material is very very theoretical today, and the people hardly see the link between this theory and the real life.

Q: What would be your choice to show in a chemistry class?
A: I always preferred to illustrate large-scale industrial processes in small-scale model experiments. H_2SO_4 production, Haber-Bosch synthesis and the electrolysis of NaCl were always on my demonstration list when I taught. I also put big efforts to demonstrate how general the redox processes can be and invoked various phenomena, like corrosion.

Q: Coming back to the Chemistry Olympiad, how do you see the enormous increase in the material covered by the problems in the Olympiads?
A: I am very happy and satisfied with that. It has a very significant feedback to the chemistry education, to the local and national competitions, and to talent development as well. I am also very happy about the large number of the participating countries.

Q: What is the most important aspect of the Olympic movement for you?
A: The enthusiasm and devotion of the teachers of the various countries and that they were always ready to volunteer the organization and preparations of the Olympiads, which subsequently initiated new local and national competitions both in Hungary and elsewhere. I can enumerate a lot of Hungarian and foreign colleagues with whom we worked during the first decades of the Chemistry Olympiad. We had wonderful moments together. A lot of them are no longer among us, but surely a lot of them are still with us and I would be very happy to meet them again.

(Stirling András)

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Catalyzer

Issue No. 2 – Saturday 12 July 2007

Today's programme

Students		Mentors and Scientific Observers		Guests	
05:30-22:00	Arrivals and registration	05:30-22:00	Arrivals and registration	05:30-22:00	Arrivals and registration
13:00-14:00	Lunch in Gödöllő	12:00-15:00	Lunch at the hotel	12:00-15:00	Lunch at the hotel
19:00-20:00	Dinner in Gödöllő	19:00-20:00	Dinner at the hotel	19:00-20:00	Dinner at the hotel

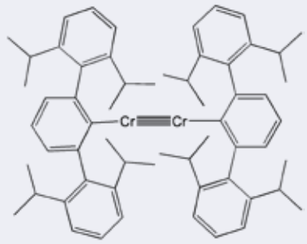
MKE - Association of Hungarian Chemists

The Association of Hungarian Chemists (Magyar Kémikusok Egyesülete) was founded in 1907 by Fabinyi Rudolf, professor of the University of Kolozsvár. At the beginning the association, with its center in the heart of Budapest, had only 40-50 enthusiastic members, young chemists and professors. Since then, surviving the storms of the two world wars, the association has gone through a period of remarkable growth and development. By the millenium it already consisted of 30 branches. Today the Association of Hungarian Chemists supports chemical education as well as industry and research. Besides that, it issues four remarkable journals of chemistry, a journal for secondary school students (Középiskolai Kémiai Lapok), two scientific journals (Magyar Kémikusok lapja, Magyar Kémiai Folyóirat) and a programme book (Havi közlemények).

Molecule of the day

Quintuple bonds were unknown in stable compounds before 2005. The organometallic compound shown above is the first example of a structurally characterized molecule containing a formally five-fold covalent bond. This bond is formed between two sterically crowded chromium(I) centers. The structure of the molecule was determined by X-ray crystallography at 90 K, which also revealed that the distance between the two chromium nuclei is 183.5 pm.
(*Science,* **2005,** *310,* **844**)

(Lente Gábor)



A quick guide to Hungarian pronunciation

c as in its
cs as in church
g as in go
gy as in duty free
j / ly both as in you
ny as in new
s as in ship
sz as in say
ty as in Tuesday
zs as in pleasure

a as in not
á as in father
é as in day
í as in see
ó as in law
ö as in early
ő is the long version of ö
ú as in fool
ü as in déjà vu
ű is the long version of ü

Fill in the gaps with correct elements from the list below, choose only one for each place.

What does a ship do when it's torpedoed? .....

When there is no gas left we say it's .....

What do we do when we are in pain? .....

sulfur, silicon, boron, zink, copper, mercury, helium, lead, argon

(collection of J. Verhagen)

Weather

We are expecting a hot sunny day with bright sunshine so remember to put on sunscreen.

Colophon

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Faculty of Science	http://ttk.elte.hu
Institute of Chemistry	www.chem.elte.hu

Welcome to the 40th International Chemistry Olympiad

Dear colleagues, dear friends,

I am delighted to welcome you to Hungary to the 40th International Chemistry Olympiad. I still vividly remember my feelings from the summer of 1987 when I had the good fortune to participate at the 19th Olympiad in Veszprém, Hungary. The inspiration of representing my country, and the joy of having an excellent company of fellow students for 10 days still bring a smile to my face.
Our objective is to see this same smile on your face in Hungary. For us organizers the 10 days of the Olympiad is the culmination of 2 year's work. We tried to think with your head to imagine what programs would make your stay memorable. The authors tailored their problems to stimulate your mind and the guides and our travel agent put together a program that combines the historical and cultural highlights of Hungary with the joy of a leisurely holiday. During the competition there will be around 160 of us to help and assist you so please don't hesitate to contact us!

I wish you a fair competition and a memorable stay in Hungary!

András Kotschy
Chairman of the Organizing Committee

Gödöllő – a royal home for students

Gödöllő is a scenic town northeast from Budapest situated in the intersection of four valleys on the bank of the Rákos Creek. The surrounding hills are covered with forests which had been royal hunting areas for centuries. The written document in which the town is mentioned is from the middle of the 14th century but the original settlement was totally destroyed during the Ottoman reign of the 15th-17th centuries. The 18th century brought a turning-point in the life of the village, when a nobleman called Grassalkovich Antal made it the center of his estate and had his palatial residence built in 1751, which, as the greatest Baroque manor house in Hungary, is still the principal landmark of Gödöllő. The Grassalkovich family perished in 1841 and the village became a headquarters in the war of independence. After the war had ended the castle was presented to Franz Joseph I as a coronation gift and it soon became one of the favourite summer homes of his wife, the Empress Elisabeth (Sissy). In 1933 it was home to the Boy Scout Jamboree and 26,000 boys from 54 nations camped in the village. In 1966 it was promoted to the rank of a town, and this was the time when it really began to attain its present form. The Saint István University of Gödöllő (with six faculties) was founded in 2000 by the fusion of five predecessor institutes of higher education. Besides the traditional faculties of agriculture and veterinary science, new ones such as rural development, environmental, technical and economic faculties were founded. The University has buildings in three cities; the University of Agriculture moved to the present central building, which had previously been the home of the Premonstratensian Grammar School, in 1950. This town, with its exceptional historical background, home to one of Hungary's internationally known universities, has many other interesting features as well. The botanical garden, the apiary museum and the sport airport are certainly well worth a visit. We hope you'll spend a memorable ten days in this beautiful environment in the town of Gödöllő.

(Vass Márton)

Margaret Island – a change of scene

The final location hosting mentors' accommodation, translation and jury meetings was chosen to be the Danubius Grand Hotel Margitsziget and Danubius Health Spa Resort Margitsziget in the heart of Budapest, yet far from the bustle of the city, on Margaret Island, which is a 2.5 km long island in the middle of the Danube mostly covered by landscape parks. This beautiful island is a popular recreational area. Throughout the history of the city it had many different names, the most interesting of them being Island of Rabbits, the result of a mistranslation from Latin. However it was a popular hunting area of the royal court and it retained the name until the 14th century, when it was given a new one after Saint Margit – daughter of king Béla IV – who lived in the Dominican convent on the island. It is connected to the city by the Margaret Bridge built in 1901, but vehicle entry is limited to buses and taxis. During a walk around the island the explorer can encounter the remnants of several monasteries, the Centennial Memorial commemorating the hundredth anniversary of the city's unification, the Music Fountain near which music is played and light shows are performed in summer, an octagonal Water Tower (functioning today as a look-out tower), a Japanese garden and numerous sports and recreation facilities. The hotels, featuring spas from natural thermal springs, shady terraces and great conference halls, and renovated in 2000-2001, are located in the northern part of the island. Interestingly the two buildings are connected by a heated underground corridor.

(Vass Márton)

Did you know...

that the element tellurium was discovered in 1782 but not named until 1798? Franz Joseph Muller von Reichenstein, an Austrian mine expert, identified tellurium in a gold ore found in Transylvania. He referred to the new element as *metallum problematicum* (Latin for "problematic metal") and had an extensive correspondence with Ruprecht Antal, a professor at the Mining Academy of Selmecbánya, who also studied the same ore but initially thought that Muller's element was in fact bismuth. Although a famous Swedish chemist, Torbern Olof Bergman confirmed Muller's analysis, the discovery was almost forgotten until Martin Heinrich Klaproth, a chemistry professor in Berlin, became involved in the late 1790s. Klaproth received ore samples from Muller, repeated earlier experiments and devised new ones. Finally he named the new element tellurium after Earth (tellus in Latin). Despite that Klaproth always acknowledged Muller as the discoverer of tellurium, the German professor was drawn into a priority dispute in 1803 by Kitaibel Pál , a botanist in Budapest. Kitaibel claimed discovery of tellurium based on a series of his own experiments, which he carried out in 1789 using a different ore. These results remained unpublished, but, according to the Hungarian professor, Klaproth had informal access to them. Apparently, Kitaibel started the dispute without reading any of the publications. Finally, Klaproth sent these papers to him to proove that Muller was the discoverer.

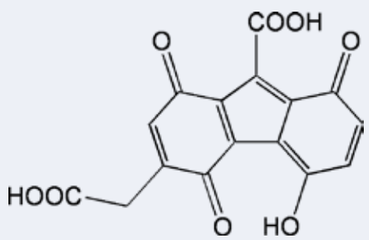
(Lente Gábor)

Today's programme

Students		Mentors and Scientific Observers		Guests	
06:00-08:00	Breakfast	07:00-08:30	Breakfast	07:00-08:30	Breakfast
07:50	Departure for Madách Theatre	09:15	Departure for Madách Theatre	09:15	Departure for Madách Theatre
10:00-12:00	Opening Ceremony	10:00-12:00	Opening Ceremony	10:00-12:00	Opening Ceremony
13:00-14:00	Welcome Reception at ELTE University	13:00-14:00	Welcome Reception at ELTE University	13:00-14:00	Welcome Reception at ELTE University
14:00-18:00	Budapest sightseeing	14:00-16:00	Laboratory Inspection at ELTE University	14:30-18:00	Budapest sightseeing
18:00	Departure for Gödöllő	16:00	Departure for the Hotel	18:00-19:30	Dinner at the Hotel
19:00-20:30	Dinner	16:30-18:00	Meeting with the Authors		
20:30-22:00	Lab safety instruction and Chemistry demonstration	18:00-19:00	Dinner		
		19:00-	1st Jury Meeting		

Molecule of the day

Hipposudoric acid was isolated from the sweat of the hippopotamus by Japanese scientists, who named the compound after its occurrence (*sudor* means "sweat" in Latin). Samples were collected from an animal in the Tokyo zoo for about half a year and the compound shown here was identified by several analytical methods. The sweat of the animal is colourless immediately after perspiration and gradually turns red. Hipposudoric acid is responsible for its color. In addition to its mild antibacterial activity it absorbs a lot of UV and some visible light thus protecting the skin of the hippopotamus from sunburn.
(*Nature,* **2004,** 429, 363)



(Lente Gábor)

Useful expressions

Good morning	Jó reggelt
Good day/afternoon	Jó napot
Good evening	Jó estét
Good night	Jó éjszakát
[An awkward greeting among youth]	Csácsumicsá
What's your name?	Hogy hívnak?
My name is...	... vagyok
How are you?	Hogy vagy?
I'm fine, thanks	Köszönöm, jól
I (don't) speak Hungarian	(Nem) beszélek magyarul
Do you speak English?	Beszélsz angolul?
Can I get my mobile back? (The answer is no)	Visszakaphatom a mobilomat?
I love Chemistry	Imádom a kémiát
I'm going to win the competition	Meg fogom nyerni a versenyt

Three reasons to become a chemist

» You can wear Clark Kent style safety glasses.

» You can always have access to some 100% pure ethanol.

» And finally: Because its pHun.

(G. D. McCallion)

Weather

We are looking forward to another hot summer day. No wind, no rain the sun is shining brightly on all those who have come for the IChO.

Colophon

Catalyzer
Journal of the 40th International Chemistry Olympiad
Issue No. 3 July 13, 2008
Editorial team: Darvas Mária, Jagasics Éva, Magyarfalvi Gábor, Stirling András, Túri László, Vass Márton, Jon Baker
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Institute of Chemistry	www.chem.elte.hu

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40th International Chemistry Olympiad
2008 Budapest, Hungary

Catalyzer

Issue No. 3 – Sunday 13 July 2008

Opening Ceremony

The Opening Ceremony will be held in the Madách Theatre. Since its reconstruction in 1999 the theatre has a total capacity of 804 people on three floors; the interior decoration is characterized by Dalmatian and Italian motifs and the mural on the ceiling designed by Götz Béla depicts the masked figures of commedia dell'arte. There is a different world-class musical performed here every season.

The program of the Opening Ceremony

» Tárogató music by Nagy Csaba

» Speech by Sólyom László, President of the Republic of Hungary

» Tárogató music by Nagy Csaba

» Speech by Hudecz Ferenc, Rector of Eötvös Loránd University

» Performance by the Baptist Bell Orchestra

» Speech by Greiner István, vice-president of the Hungarian Chemical Society and Deputy Director for Research of Richter Gedeon Plc.

» Sebestyén Márta sings, accompanied by Szokolay Dongó Balázs on bagpipes

» László Szepes, Eötvös Loránd University, Chairman of the 40th IChO

» Tárogató music by Nagy Csaba and dance

» Speech by Manfred Kerschbaumer, President of the Steering Committee

» Sebestyén Márta sings, accompanied by Szokolay Dongó Balázs on bagpipes

Nagy Csaba studied clarinet at the Bartók Béla Secondary School of Music. During the years of his musical studies he learnt to play the "tárogató" of which he has also written several studies. As he says the secret of this instrument lies within the mixture of the sound of the clarinet, oboe and bassoon and with his music he evokes the tunes of Hungarian dances. He has had concerts all over Europe as well as in Japan and Canada.

The **Újpest Baptist Bell Orchestra** was formed in 1991 by music-loving youngsters. The instruments arrived in Hungary from the United States, the set was made up of 37 bells, which makes it possible to play a register of 3 octaves. You can hear them play transcriptions of bells of classical composers as well as adaptations of ecclesiastical songs or works composed on bells.

Sebestyén Márta was born in Budapest (1957). Her mother, a music teacher studied with the great composer and ethnomusicologist, Kodály Zoltán. Having a wonderful voice, she is one of the most authentic interpreters of the Hungarian traditional folk music. She is giving concerts all over the world both as a solo artist and as a guest performer with Hungarian and international folk groups. Her collaboration with the French group Deep Forest resulted in a Grammy Award in 1996. She recorded with Peter Gabriel and was the voice of the "English Patient" awarded with 9 Oscars (also for the music) in 1997.

Szokolay Dongó Balázs plays folk music and improvisative music inspired by folk music on bagpipe, flute and saxophone. He started the adaptation of folk music after thoroughly studying the folklore of the Carpathian Basin. His own compositions not only bear the musical culture of the past centruries in themselves but also have a modern, contemporary sounding. He holds the title of Young Master of Folk Art. He got an Artisjus Award in 2005.

(Jagasics Éva)

Jalsovszky István and his safety show

This evening, after the lab safety instructions, **Dr. Jalsovszky István** is going to surprise you with an unconventional chemistry demonstration. He teaches organic chemistry on basic and advanced level alike, chemical safety for beginners often jazzed up with spectacular experiments, and holds organic laboratory courses at Eötvös Loránd University. His main research area is the chemistry of cubane derivatives and formerly the stereoselective synthesis of organosulfur compounds. He participated in the 4th IChO (Moscow) where he achieved a good result but at that time there were no medals given out.

Snapshots on arrival

At around ten o'clock the first groups started to gather in the hall of the Hotel in Gödöllő. Coming from the airport all the guys were exhausted from the journey, still their smile revealed their feeling of exitement. Here are the first photos of the arriving groups taken right at the registration:

Did you know...

that magic acid is a two-component mixture being 10^3-10^{25} times (depending on the composition) more acidic than concentrated sulfuric acid? It is a super acid containing FSO_3OH (a protic or Brønsted acid) and SbF_5 (a Lewis acid) introduced by Oláh György (a patron of the Olympiad, 1994 Nobel laureate of chemistry). In such a strongly acidic medium, many unusual things can happen, e.g., free carbenium ions (organic cations having three ligands) can form, with long enough life-times to be studied by methods such as NMR and infrared spectroscopy. Even saturated hydrocarbons can be protonated, thus producing organic cations with more than four formal bonds to carbon (they are called carbonium ions). The name "magic acid" for the FSO_3H-SbF_5 system was introduced by one of Oláh's German postdoctoral fellows (Joe Lukas), who after a laboratory Christmas party put the remains of a candle into the acid. The candle dissolved, and the resulting solution gave a clear NMR spectrum of the tertiary butyl cation. Initially the term "magic" was only laboratory slang, but was subsequently introduced into the chemical literature. Finally, one of Olah's graduate students (Jim Svoboda), who started a small company to make some of the superacid systems and reagents available commercially, obtained trade name protection for Magic Acid. It has been marketed as such since that time.

(Pálinkó István)

Main sponsors:

Richter Gedeon

Ministry of Education and Culture
OKM

Today's programme

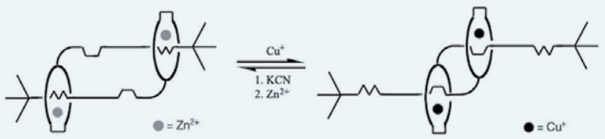
Students		Mentors and Scientific Observers		Guests	
06:30-08:30	Breakfast	07:00-09:00	Breakfast	08:00-09:00	Breakfast
08:15	Departure for Tihany	08:00-17:00	Translation of the Practical Exam	10:30-12:00	Boat trip to Szentendre
11:30-14:00	Sightseeing in Tihany	12:00-13:00	Lunch	12:00-14:00	Szentendre sightseeing
14:30-16:40	Beach program in Balaton-füred	15:00-17:00	Departure for Szentendre in two groups	14:00-16:00	Lunch
17:30-19:00	Dinner in Baricska Csárda	18:00-19:00	Folklore program in Szent-endre	16:00-18:00	Visit to Caproce Factory
19:00	Departure for Gödöllő	19:00-21:15	Dinner	18:00-19:00	Folklore program in Szent-endre
		21:15	Departure for the Hotel	19:00-21:15	Dinner in Szentendre

Molecule of the day

Molecular machines can be designed to mimic biological processes such as contraction and stretching of the skeletal muscles. A symmetric rotaxane dimer is able to function as an "artificial muscle". The motion is easy to visualize: both strings move along one another but stay together thanks to the intertwined nature of the system. Each filament contains both a bi- and a tri-dentate chelator part; the dimer can be set in motion by exchanging the complexed metal centers. The free ligand obtained by reacting the tetracoordinate Cu^{+} complex with KCN further reacts with $Zn(NO_3)_2$ to yield a pentacoordinate Zn^{2+} complex in the contracted state. The reverse motion is induced by the addition of $Cu(CH_3CN)_4^{+}$. The length of the backbone changes from 85 to 65 Å between the two forms.

(*Chem. Eur. J.*, **2002**, 8, 1456)

(Vass Márton)



Useful expressions

Are we there yet?	Ott vagyunk már?
Inflatable swim ring	Felfújható úszógumi
Cotton candy	Vattacukor
Deep-fried flat bread with garlic and sour cream	Fokhagymás tejfölös lángos
Nice weather isn't it?	Szép időnk van, nemde?
A storm is brewing	Vihar készülődik
Let's go swimming	Menjünk úszni
I left my swimming suit at home	Otthon hagytam a fürdőruhámat
Will the water get any deeper?	Lesz mélyebb is a víz?
Look! A shark!	Nézd! Cápa!
Help!	Segítség!
Wait!	Várj!

The real definitions of some branches of chemistry

Organic chemistry: the practice of transmuting vile substances into publication.
Physical chemistry: the pitiful attempt to apply y = mx + b to everything in the universe
Inorganic chemistry: that which is left after organic, analytical and physical chemists get through pickning over the periodic table.

(J. Verhagen)

Weather

Hurray, no rain! Let us hope it will remain so and go to the beach!

Colophon

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Catalyzer

Issue No. 4 – Monday 14 July 2008

Balatonfüred
the gemstone of Balaton

The settlement lying on the northern shore of Lake Balaton was the first among Hungarian towns to receive the title of *spa*. It is also famous for the superior quality wine of the area and the traditional Anna Ball, organized annually since 1825. The history of the town goes back as early as the middle ages when seven small settlements stood in the area. From these only two, Arács and Balatonfüred survived the storms of history. Arács, or the Old Town as the locals call it, lies further from the lake in the hills while the original Balatonfüred or the New Town consists of the lakeshore areas and downtown. The most famous point in Arács is a small hill on which the ruins of a medieval church and a 19th century cemetery can be found. From this hill a stunningly beautiful panorama opens towards the lake. The most spectacular sights of the downtown area are the Catholic Church built of red stone and the white Protestant Church. Close to the shore of Lake Balaton stands the imposing building complex of the hospital (which specializes in cardiology), situated near to the Tagore Promenade, which runs along the lakeshore and was named after Rabindranath Tagore, a famous Indian poet. Next to the promenade there is a shaded park (with some of the trees planted by Nobel laureates) containing a coat of arms of Hungary made from flowers. Visitors to Balatonfüred should try the so-called sour water of the town which comes from springs discovered in the 1700s. The spa gained importance when the first health bath was built in the town in the beginning of the 1700s. The sour water contains calcium and magnesium hydrogen-carbonates and sulfates and a significant amount of carbon dioxide.

(Darvas Mária)

Tihany
the village of legends

Tihany is a beckoning historic village lying on the northern shore of Lake Balaton on the Tihany Peninsula. The Benedictine Abbey standing in the center of the village was founded by Andrew I, who was buried in the crypt there in 1055, only half a century after the foundation of the Hungarian state. The first extant record of the Hungarian language is embedded in the founding charter of this abbey, which is today preserved in the Archabbey of Pannonhalma. The church of Tihany was originally constructed in the Romanesque style but it was destroyed and later rebuilt in the baroque style in 1754. The spectacular building is a favourite place for tourists due to its artistic and historical significance. The *echo of Tihany* is one of the legendary features of the place and has inspired many famous poets. It has existed since the XVIII century but is less effective today due to changes in the landscape. The other well known legend connected to the village is about the so-called *goat's nails*, brought ashore by the waves. According to the story, there was a very self-conceited princess who had golden-haired goats. She was cursed by the king of the lake because of his proudness and all her goats drowned in the Balaton; sometimes even today their nails are washed ashore. In fact the nails are worn shells of prehistoric bivalve clams. We hope you will enjoy a nice summer day in this charming village.

(Darvas Mária)

At the opening ceremony

Yesterday in the morning we had the chance to take part in the Opening Ceremony held at Madách Theater, one of the most imposing theaters of Budapest. The pictures reveal the elevated spirit of the ceremony:

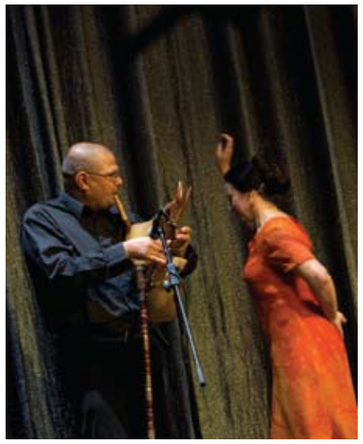
Snapshots from the attentive audience

Hudecz Ferenc the rector of ELTE called the participants not only to compete but to establish lasting new friendships

2008 is the year of reneaissance in Hungary. These dancers performed a so called kuruc dance from the end of that period

Manfred Kerschbaumer, the Austrian President of the Steering Comittee opened the 40th IChO with a witty speech

Szepes László welcomed Hartmann Hildegard, one the organizers of the very first Olympiad



Szokolay Dongó Balázs and Sebestyén Márta gifted us with a stunningly creative performance of authentic Hungarian folk music.

Sightseeing in Budapest – the first glimpses

Yesterday in the afternoon a bunch of young chemists invaded the city of Budapest eager to explore its secrets, longing to get acquainted with some Hungarian traditions. Let see now from where they had started their 'expedition', what had they already known about Hungary and its capital. Four teams were ready to answer my investigating questions: Canada, Denmark, Ireland and Mongolia

Ireland

Q: Have you ever been to Budapest, have you heard anything interesting or strange about it?

A: No, unfortunately we have not been here before, but my friends who have told us it was a great experience to visit Hungary and Budapest is a lovely historic city.

Q: Hungary is famous for its cooking traditions. Do you know any special Hungarian food? If yes what, have you ever tasted it?

A: Yes, I know goulash which must be some spicy soup or stew.

Denmark

Q: Have you ever been to Budapest, have you heard anything interesting or strange about it?

A(Denmark): Yes I have already been here and I had the chance to visit Saint Stephen's Basilica and I saw a mummified hand exhibited there.

Q: Hungary is famous for its cooking traditions. Do you know any special Hungarian food? If yes what, have you ever tasted it?

A: No, I am vegetarian, ask the boys!

Q: Boys?

A: Yes, I have tried the goulash. Actually we also have some kind of goulash in Denmark, but it is a little bit different.

Mongolia

Q: Have you ever been to Budapest, have you heard anything interesting or strange about it?

A: Never, but we are very happy to be in Europe, it is fun!

Q: Hungary is famous for its cooking traditions. Do you know any special Hungarian food? If yes what, have you ever tasted it?

A: Yes, I have it is spicy and tasty, I like it.

Canada

Q: Have you ever been to Budapest, have you heard anything interesting or strange about it?

A: I have heard it is an interesting historic city, really nice to be here indeed!

Q: Hungary is famous for its cooking traditions. Do you know any special Hungarian food? If yes what, have you ever tasted it?

A: I have heard about salami and goulash and I am eager to taste them, they must be nice.

Did you know...

that Hungary has a large number of thermal and mineral springs which is unusual for a country without active volcanism? There are numerous spas all over the country, more than a dozen within Budapest, and a corresponding bath tradition. The analysis of the waters was an important stimulus for the development of chemistry in the country. The first book on chemistry in Hungarian was written on this topic in 1800 and the most widely recognized Hungarian classical chemist also started his analytical studies on water. The iodometric method to determine the amount of dissolved oxygen in water still bears the name of Winkler Lajos. His predecessor as the head of the Institute of Chemistry, Than Károly, was the first to synthesize carbonyl sulfide and detect it in mineral waters. Unreactive COS gas was only a footnote in inorganic chemistry books for a century, but today its role in the sulfur cycle and biogenesis is actively researched. In addition to the mineral springs carbonated naturally, many Hungarians carry out water carbonation at home with small CO_2 cartridges that are filled at the largest pure carbon dioxide well in Europe located in western Hungary. The first large scale carbonation equipment was also an invention of a Hungarian, the eccentric monk and physics professor Jedlik Ányos. He never patented this process or any of his many other inventions.

(Magyarfalvi Gábor)

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Students		Mentors and Scientific Observers		Guests	
06:15-07:00	Breakfast	07:00-08:45	Breakfast	07:00-08:45	Breakfast
07:00	Departure for ELTE University	09:00-13:00	Budapest sightseeing	09:00-13:00	Budapest sightseeing with the Mentors
08:30-14:00	Practical Exam	13:00-14:00	Lunch at the hotel	13:00-15:00	Lunch in the city
14:00-15:00	Lunch	14:00-18:00	Consultation with the Authors	15:00-16:00	Visit to the Houses of Parliament
16:00-18:30	Visit to the Houses of Parliament and the Museum of Ethnography	18:00-19:00	Dinner	16:00-18:00	Free time
19:00	Departure for Gödöllő	20:00-	2nd Jury Meeting	18:00-19:00	Dinner at the hotel
20:00-21:00	Dinner				

Molecule of the day

Noble gases such as argon have a complete electron octet, and thus full s and p subshells, which is responsible for their remarkably low reactivity. Nowadays, however, it is widely known that the heavier noble gases have stable compounds (for instance XeF_6). In 2000, Finnish scientists managed to synthesize and characterize the first argon compound (HArF) by impinging UV light onto frozen argon containing a small amount of hydrogen fluoride. The molecule is extremely unstable and decomposes above -233 °C.
(*Nature,* **2000,** 406, 874)

(Darvas Mária)

The motto of the day

A tidy laboratory means a lazy chemist.

(J. J. Berzelius)

Useful expressions

Round bottom flask	Gömblombik
Your safety glasses are cool	Király a védőszemüveged
Hold this for a moment	Fogd meg egy percre
It's hot	Ez forró
It's extremely flammable	Nagyon gyúlékony
Can I use your tweezers?	Használhatom a csipeszed?
The vacuum is not sufficient	Nem elég jó a vákuum
The substance didn't precipitate ☹	Nem vált ki az anyag ☹
Try scratching with a glass rod	Próbáld üvegbottal vakargatni
The [ground glass] joint got stuck	Beragadt a csiszolat
The burette is dripping	Csöpög a büretta
The fuse in the spectrophotometer blew	Kiégett a spektrofotométer biztosítéka

Curiousity of the day

To produce intensive blue light is a real challenge. In fireworks usually CuCl is used to produce blue stars, but they are never very bright. Even bigger challenge was to produce an efficient solid state device emitting blue light without burning up in seconds. It has been solved in Japan in the nineties: gallium-nitride deposited on sapphire has been the right solution. Nowadays this is the basis of the blue LED-s and blue laser-diodes.

(Stirling András)

Weather

It seems to be cold, windy and rainy today. Lab coats will not be too hot for today, but umbrellas for the trip in the afternoon!

Colophon

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40 Hu 08
40th International Chemistry Olympiad
2008 Budapest, Hungary

Catalyzer

Issue No. 5 – Tuesday 15 July 2008

Budapest – as it was and as it is

After the practical exam you will see another bit of Budapest, so let's see some facts about the city and what places are worth visiting:

The territory of Budapest has always been inhabited, but it became Hungarian only in 896 when the seven Hungarian tribes, lead by Árpád, conquered the Carpathian Basin. The first dynasty of Hungary, the Arpadian House, had for at time its seat in Old Buda. After the Mongolian attack (13th century) the country was reconstructed, thanks to King Béla IV who also ordered the building of Buda Castle on Castle Hill. The 14th century was the start of a prosperous period for the three towns (Old Buda, Buda and Pest) which reached its peak in the reign of King Corvinus Mátyás, when Buda became the centre of culture and arts in Europe. Defeat in the Battle of Mohács (1526) began 150 years of Ottoman occupation, a period of decay.

Buda was liberated by the United Christian Army, and new settlers arrived from German territories thus beginning the period with the Habsburgs. The Hungarian War of Independence in 1848-49 was quashed and was followed with a terrible revenge by the Habsburgs. Only after the Compromise (1867) was life brought back to normal. The former independently developing three towns, Old Buda, Buda and Pest were united under the name Budapest in 1873.

The 1000th anniversary of the Hungarian Conquest was celebrated nationwide in 1896, and countless buildings and memorials were inaugurated for the occasion. The most important is Heroes' square, our national pantheon. It is enclosed by two huge museums built in the neo-classical style: the Museum of Fine Arts and the Exhibition Hall. Behind the square there is City Park and the Castle of Vajdahunyad.

In front of the square is the start of Andrássy Avenue, which has been declared a World heritage site by UNESCO. The Continent's first underground was built under this avenue. The Opera House, the "jewellery box" of Budapest, was also built on Andrássy Avenue. It is a very richly decorated neo-renaissance building. Close to end of the avenue is Budapest's main Roman Catholic Church, St. Stephen's Basilica. (It was named after our first king.) Pope John Paul II visited here, in 1991.

The most stunning stop of any exploration tour, however, may be the Houses of Parliament, the most expensive building in Hungary, which we'll visit today. The ground was broken on the quay in 1885, and the building took 17 years to complete with an average of 1000 workers labouring at any one time. It cost 37 million gold crowns for which amount a town of 20 000 inhabitants could have been built. 40 kilos of 23 carat gold were used for the interior decoration. Whenever possible Hungarian materials and Hungarian techniques were used and Hungarian master craftsmen employed. The northern and southern wings of the building each serves one house of the legislature. They are connected by an enormous dome hall, which was once the site of unified sessions, today the Holy Crown is on display here. The dome itself is 96 metres high, also as a memento of the Conquest.

(Moór Anna)

The practical exam – strategies and preparation

Yesterday we spent a nice but very rainy and cold day at Lake Balaton or as we Hungarians proudly call it 'the Hungarian Sea', but the good times are over and today participants will have to face their first challenge, the Practical Exam. I asked some of the teams how they feel about it and here are their answers.

Vietnam

Q: Today is the day of the practical exam, and I am really curious about your feelings. Are you nervous?
A: We are a little nervous, yes. It is very exciting to be here.

Q: Do you have any laboratory classes in your school?
A: Yes we have one in a week.

Q: What do you do in these classes? What kind of experiments do you carry out?
A: We do analytical chemistry mainly. We titrate a lot and also we do some qualitative analysis, color reactions and so on.

Q: Do you have any funny story that happened in the lab with you or your friends?
A: Well actually, every time we enter the laboratory something is broken ☺.

Russia

Q: Today is the day of the practical exam, and I am really curious about your feelings. Are you nervous?
A: No, not at all, come what may come, we are absolutely calm.
A(Russian guide): They were already studying this morning when I went there to wake them up ...

Q: Do you have any laboratory classes in your school?
A: Are you kidding? No.

Q: How did you prepare then for the contest?
A: We had a three-week-long preparatory course in Moscow during which we were taught to carry out some experiments.

Singapore

Q: Today is the day of the practical exam, and I am really curious about your feelings. Are you nervous?
A: We are very much excited and nervous. We would like to get over it as quickly as possible.

Q: Do you have any laboratory classes in your school?
A: Yes, we have a two-hour-long laboratory class every week but it is different for the different schools, for example the other members of the team have shorter class.

Q: Apart from these classes, did you have any preparatory course for the practical exam?
A: Yes, we had an intensive course which lasted for one week.
Q: Do you have any funny story that happened in the lab with you or your friends?
A: I remember once our teacher touched a hot-plate and then he told us he could not feel anything with his hand.

The practical exam of the first Olympiad

As a result of long and exhausting research and investigation the organizers managed to dig the problems of the practical exam from the very first Olympiad from the archives. So look back in history, here they come

Problem 1

There are ten test tubes in the rack at your disposal (1 – 10) and each test tube contains one of aqueous solutions of the following salts: Na_2SO_4, $AgNO_3$, KI, $Ba(OH)_2$, NH_4Cl, Ag_2SO_4, $Pb(NO_3)_2$, NaOH, NH_4I, KCl.
For identification of the particular test tubes you can use mutual reactions of the solutions in the test tubes only.
Determine in which order the solutions of the salts in your rack are and write chemical equations of the reactions you used for identification of the salts.

Problem 2

Each of the six test tubes (A – F) in the rack contains one of the following substances: benzoic acid, salicylic acid, citric acid, tartaric acid, oxalic acid and glucose.
Determine the order in which the substances in the test tubes are placed in your rack and give chemical reactions you used for identification of the substances.
For identification of the substances the following aqueous solutions are at your disposal: HCl, H_2SO_4, NaOH, NH_4OH, $CuSO_4$, $KMnO_4$, $FeCl_3$, KCl, and distilled water.

Thanks to Anton Sirota for providing the texts of the problems.

Did you know...

that cows and other ruminants produce almost 20% of the World's annual methane emission due to their digestive processes? I am sure you did and you also know that methane is a very important greenhouse gas. However, you might not be aware of some indirect consequences of the dairy production of Hungarian cows. The most notable of them is our national phenomenon, Túró Rudi. This is a delicious chocolate bar stuffed with quark, extremely popular in Hungary, that can be easily recognised by its red-dotted wrapping. Every day more than half a million Túró Rudis are sold and eaten. As both chocolate and quark are great favourites of Hungarian people, their combination is irresistible. But what is quark exactly? Quark is produced from milk using lactic acid bacteria. Their diligent work acidifies the milk and when the pH is lower than 4.6, casein (essential protein of milk) precipitates. This precipitate is in fact quark. After some filtering and drying it is ready for consumption. We use it for both sweet and salt dishes. Quark is mainly produced in Central and Eastern Europe so it is no surprise if you've never heard of it. So go and get a Túró Rudi. Or more... as we usually do.

...and that...

the ball point pen we use almost every day was patented only 70 years ago by a Hungarian editor, Biró László, who was fed up with the continuous struggle with his fountain pens (filling them up, cleaning the leaked ink, etc...). Inspired by the fact that the ink used in printing newspapers dries very quickly, he created a new type of pen with the help of his chemist brother. For this pen he needed a new mechanism to deliver the ink. Together they constructed the ball-point pen – the mechanism is the same as in roll-on deodorants. The viscous ink from the ink cartridge is picked up by the little ball and delivered onto the paper as the pen moves along. Today this ball is made of brass, steel or tungsten carbide. The inventor's name has been preserved in several languages (English and Spanish among them) as „biro". Ball-point pens utilize gravity, so you cannot write with them upside down. How about writing in outer space with them?

(Stirling András)

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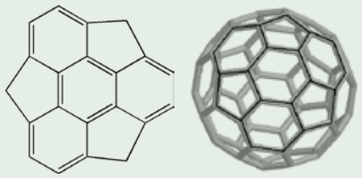
Today's programme

Students		Mentors and Scientific Observers		Guests	
07:00-08:30	Breakfast	07:00-09:00	Breakfast	08:00-09:00	Breakfast
09:00-09:30	Walk to the Grassalkovich Manor House	08:00-	Translation of the Theoretical Exam	09:00-18:00	Whole day program in the Hungarian Great Plain
09:30-12:00	Team games - Theme games	13:00-14:00	Lunch	18:30-19:30	Dinner at the hotel
12:00-12:30	Walk back	18:00-19:00	Dinner		
12:45-14:00	Lunch in Gödöllő				
14:00-17:00	Interactive costume play				
17:00-19:00	Free time				
19:00-20:00	Dinner				

Molecule of the day

Sumanene may not appear a very exciting compound at first sight. However, a closer look at this aromatic molecule reveals that it is a fragment of buckminsterfullerene, C60. The molecule is bowl-shaped with a bowl depth of 118 pm. Its name was derived from the word *suman*, which means 'sunflower' in both Hindi and Sanskrit. Sumanene itself and other similar compounds may be very important in the rational synthesis of fullerene derivatives. (*Science,* **2003,** 301, 1878)

(Lente Gábor)



Useful expressions

A copper angel whistling on a willow tree	A fűzfán fütyülő rézangyalát
His/Her sons' things	Fiaiéi (most vowels in a row)
For your repeated pretending that you are unprofanable (longest non-compound word)*	Megszentségteleníthetetlenségeskedéseitekért
What are you frying little furrier, are you frying salted meat little furrier? (tonguetwister)	Mit sütsz kis szűcs, sós húst sütsz kis szűcs?
You committed this fake crime (tonguetwister)	Te tetted e tettetett tettet
Our translation is ready	A mi fordításunk kész
We finished printing	Végeztünk a nyomtatással
I'll go back to my room	Visszamegyek a szobámba

Curiousity of the day

Cold welding is an interesting phenomenon: clean, flat surfaces of a given metal strongly adhere when brougth into contact under vacuum. In your opinion is it an exothermic or endothermic process? Is it a chemical process? How does the entropy change during the process?

Three good ways to get thrown out from a chemistry laboratory

1. Pretend that an electron got stuck in your ear and insist on describing the sound to the others.
2. Pop a paper bag at the crucial moment when the professor is about to pour sulfuric acid.
3. Deny the existence of chemicals.

(collection of J. Verhagen)

Weather

We are looking forward to another unpleasent windy and rainy day. So wear your sweaters and carry an umbrella with you wherever you go today.

Colophon

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Catalyzer

Issue No. 6 – Wednesday 16 July 2008

You know you are Hungarian...

» when feeding your guests is your main priority even if they claim they're not hungry and in which case you get slightly offended/upset that they don't want your hospitality.

» when you know that "a copper angel whistling on a willow tree" is actually a profane expression!

» when you use fruit to make soup.

» when you tend to feel sorry for yourself for no particular reason and complain a lot.

» when you know that the "goulash" you see in many restaurants has in fact little/nothing to do with the gulyásleves we really eat.

» when meeting another Hungarian in a country outside of Hungary is amazing.

» when you love Túró Rudi but can't really explain to foreigners what the hell it is until they try it.

» when you have a funny accent in every other language you speak.

» when you call a 79 km long lake (the Balaton) the Hungarian Sea.

» and you are able to swim across it!

» when your language has two words for love.

» when you have a name day and no foreigner understands what that's good for.

» when zou can't tzpe on and English keyboard because y and z are mixed up.

» when you believe that all geniuses and celebrities have some relation with Hungarians. Or they just simply are Hungarians.

» when Winnie the Pooh and The Flintstones is actually much funnier translated into your language than the original.

» when you know that all parts of a pig are edible, and it takes only half a day, some friends from the countryside and 2 litres of pálinka to prove it.

» when it surprises you again and again, how much more impressive and chiselled the Hungarian translations of most non-Hungarian poems are than the originals.

» when you can make astonishingly delicious dishes without spending more than 3 euros (krumplistészta, káposztástészta, túróstészta).

» when you can (actually) pronounce gy, as in "hogy vagy" – and not say hogi vagi.

» when friends/family celebrate your birthday by pulling your ears.

» when there is thermal water or a spa in your hometown or very close to your hometown.

» when people from all over the world keep on asking you if you understand anything from the Finnish language.

» when someone says that Hungarian "is like Russian and all those other Slavic languages" and then you have to go into great detail about the origins of Hungarian with a scolding history lesson.

» when you know why the bells of every church ring every day at noon.

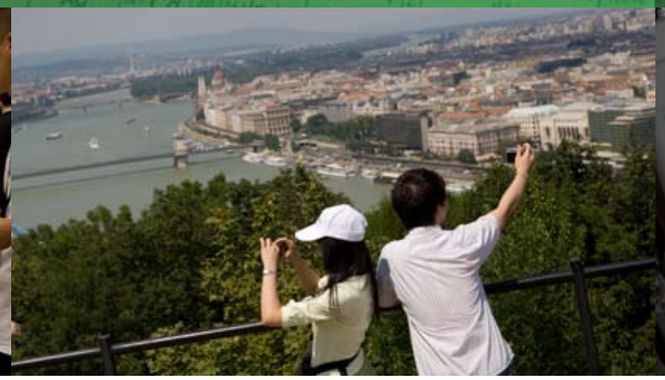
» when there's a Petőfi, a Széchenyi, and a Kossuth street even in the most backward settlement. And you can get anywhere in Hungary just by consistently following Kossuth street through every towns you go through.

» when you are having a hard time explaining to foreigners that actually when you write or say your name, your family name/surname comes first.

» when having a barbecue means roasting lard on a stick and dripping the grease on bread.

» when you think bread, lard and pálinka is a balanced meal as long as you also have onions.

» when you live abroad and wander around in a bookstore, you very frequently end up in the travel section, longingly staring at the photos of an unbelievably gorgeous Budapest (or whichever city you are from).



The three trials – fairy tale

Part 1

Once upon a time there was a flourishing kingdom called Chemilia. Its king was very old and to his deepest sorrow none of his three sons, Nicholas Calculus, Andreas Historicas and the smallest Marcus Literatus, was willing to take over his sparkling ruby crown. In his despair the king finally decided to find an heir to his throne in a sensational competition.

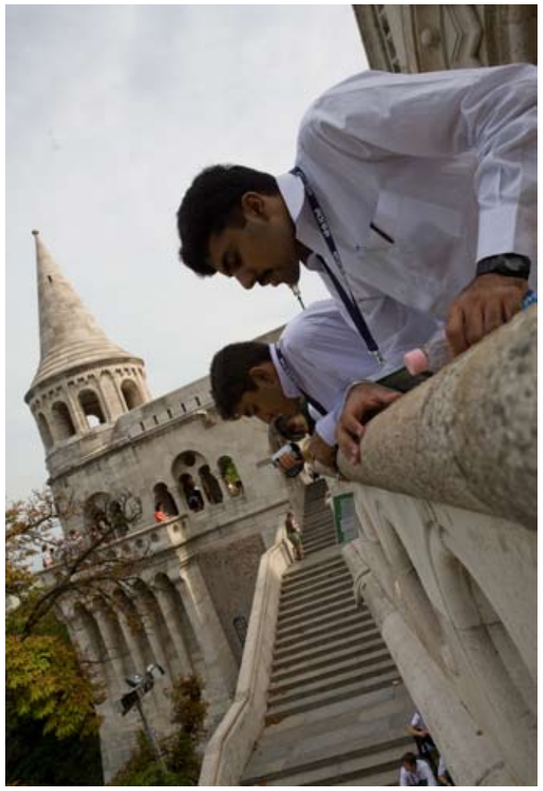
So he sent out many carts to all the countries in the world to bring every youngster brave and clever enough to stand his trials to the kingdom of Chemilia. The cart called Hydrogen went to America and to the far-lying Asia, the others went to other parts of the world, but there was so many of these carts that no sane earthly carbon-based creature would be able to remember them all. The courageous youngsters came in amazing amounts. I daresay there were more than 10^{21} moles of them.

The competition was opened on bright Sunday morning in the fancy sparkling theater of Chemilia with the following words of the king: 'My dear children I am here to call you for a contest. The bravest and the most clever who can stand my three trials will be awarded a medal of Au and will get the right to rule over all the four provinces of my kingdom; Organica, Inorganica, Physico-chemica and Analytica; and also over the treasure island called Quantummechanico on the sea of H_2O. Now listen carefully because I am going to tell you what my three trials are. The first one will be easy, you will have to explore my country with help the green elves called Guides. If you are ready with it you will have to face the second trial which is much harder than the first one, you must defeat Bunsen Burner the dragon and after that learn to work with two original inventions of Chemilia, the burette and the pipette. All I have to say to you is be very punctual and precise with them. Those who stand these trials can go for the last and hardest one, in which you have to show how clever and smart you are by answering my tricky questions. So all I can wish you is good luck and a fair contest. '

Thus the competion started. All the youngsters stood the first trial easily, they explored beautiful Chemilia in two exhausting days with the help of the Guides, the diligent green elves, and were ready for the second trial. On the day of the second trial the brave youngsters were taken to the cave of Bunsen Burner, the dragon in soaking downpour, and dressed up in their white lab coat armor and glasses they gloriously defeated the dragon. After that they found the Chemilian inventions hidden deep down in the cave and- remembering the king's admonitory words- started to work with them precisely and punctually. They stood this trial too and contented with their victory waited for the third one...

...to be continued

(Darvas Mária)



Did you know...

that Wigner Jenő (Eugene Wigner), the famous Hungarian physicist, who developed the theory of symmetry in quantum mechanics as well as achieving brilliant results in nuclear physics (Nobel Prize, 1963), graduated as a chemical engineer at the Technical University of Berlin? If not, do not worry, you are not alone. Wigner was the chief designer of the first working atomic reactor which was constructed in Chicago in collaboration with DuPont. At a meeting during the project one of the DuPont engineers told him: "Dr. Wigner, you tell us all about nuclear physics; we are chemical engineers, we'll do the rest." "Gentlemen", – Wigner replied – "you are greatly mistaken; I am a chemical engineer too; I have my diploma from the Berlin Institute of Technology." Indeed Wigner contributed essential ideas to the design of the reactor even at the price of personal friction with DuPont. In fact, the extraction of Plutonium and reactor cooling required considerations involving both conventional chemical engineering and nuclear physics.

...and that...

the famous mathematician, John von Neumann who contributed to computer science, economics, game theory, quantum mechanics and various fields in mathematics was in fact a chemical engineer? He obtained his diploma at the Technical University of Zurich, because his father had insisted that he had to get a university degree in a field more profitable than mathematics. Nevertheless, the young Neumann obtained another degree in maths in the same year but in Budapest. He then continued his sparkling mathematical career in various fields. You might wonder if his "chemical" years in Zurich held him back from pursuing his math career. No, you can stop worrying. In Zurich, he only attended the university at the end of each semester, just to sit for the exams. Due to his excellent memory he passed them easily. He spoke five languages (Hungarian, French, German, Latin, Classic Greek) at the age of ten, he could quickly memorize a page from a telephone book and recite the numbers and addresses. His ability to perform lightning fast calculations was legendary: it was said that he could check the calculations of the first computers by performing the same calculations in his head.

(Stirling András)

Main sponsors:

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Ministry of Education and Culture
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Today's programme

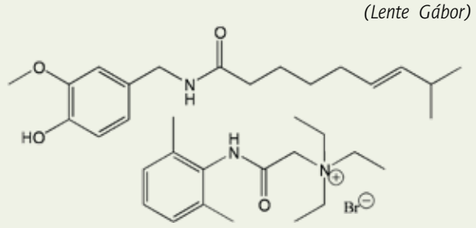
Students		Mentors and Scientific Observers		Guests	
06:00-07:00	Breakfast	06:45-08:15	Breakfast	06:45-08:15	Breakfast
07:00	Departure for ELTE University	07:30-08:30	Departure for Pannonhalma in two groups	07:30-08:30	Departure for Pannonhalma in two groups
09:00-14:00	Theoretical Exam	10:00-15:00	Visit to the abbey and the winery in two groups	10:00-15:00	Visit to the abbey and the winery in two groups
14:00-15:00	Lunch	11:30-14:30	Lunch in two groups	11:30-14:30	Lunch in two groups
15:00-17:15	Free time in Budapest	14:30-15:00	Departure for the hotel	14:30-15:00	Departure for the hotel
18:00-22:30	Reunion Party on Európa River Boat	18:00-22:30	Reunion Party on Európa River Boat	18:00-22:30	Reunion Party on Európa River Boat
22:30	Departure for Gödöllő				

Molecule of the day

Capsaicin and QX-314 are an odd couple of molecules. The former is the chemical that makes chili peppers spicy, whereas the latter is a seemingly useless local anaesthetic that cannot enter cells on its own because of the positive charge on one of the nitrogen atoms. However, when QX-314 was used together with a little bit of capsaicin in experiments involving rats, the result was pain inhibition without blocking any other senses. The spicy molecule opens up an ion channel, which lets the anaesthetic in to exert its effect only where it is needed most.

(**Nature,** *2007,* **449, 607**)

(Lente Gábor)



Useful expressions

I'm not nervous	Nem izgulok
There's totally no sense in this	Ennek nincs semmi értelme
Do you know the solution?	Tudod a megoldást?
I can read your mind	Olvasok a gondolataidban
I &@$%-ed it up	El &@$%-tam
Let's go see the...	Menjünk el megnézni a ...-t
Open/Closed	Nyitva/Zárva
Can I try this on?	Felpróbálhatom?
How much does it cost?	Mennyibe kerül?
Can you give a discount?	Tudná olcsóbban adni?
He/She pays for me	Ő fizet helyettem
Where did you get that?	Azt honnan szerezted?

You might be a chemist if...

...you think fresh air smells bad.

...you played with explosives as a kid and you still have all your fingers.

...you wash your hands BEFORE using the bathroom.

(collection of J. Verhagen)

Attention

Oláh Máté the guide of the team of the USA lost his grey Budmil wallet, if someones knows something about it please do not hesitate to tell him

Weather

The weather is getting better, at least it seems so. The temperature is indeed a bit higher and the sun seems to be shining, but remember: NEVER BELIEVE THE WEATHER-MAN!

Colophon

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Catalyzer

Issue No. 7 – Thursday 17 July 2008

The shopping street

We have already had some sightseeing but you may have been waiting for a chance to explore the city by yourself and today, after the theoretical exam, Budapest will be all yours. The biggest shopping area in Pest can be found next to the riverside expanding out from the Great Market Hall at Fővám tér to Vörösmarty tér in a north-south direction. This pedestrian street is called Váci utca, so keep that name in mind. There are many open-air restaurants offering various traditional dishes or you may like to have a cappuccino in one of the elegant classical or extravagant modern cafés.

As to shopping facilities, all the international brands' stores are represented here and you might even find some discounts if you are lucky. If you are looking for some nice souvenirs you can find many vintage and folk handicraft stores selling pottery, hand-woven fabrics, embroidery, wood carvings and traditional Easter eggs. Close to the shopping district there are also good places for just hanging around: you might be interested in Ráday utca, Szabó Ervin tér, Károly körút, Király utca and Liszt Ferenc tér.

The Market Hall (Vásárcsarnok) is an imposing classical building situated in Fővám tér. It has distinctly coloured bricks and a vividly patterned ceramic roof. Ground floor, left side: seasonal products (fruits, vegetables) right side: spices, confectionary, bakery, diary products, rare fruits and vegetables. Basement: pickles, butcher's, oriental store. First floor: souvenir-store, mostly folk products.

Specific souvenirs ("Hungaricums")

Most material mementos of Hungary are connected with eating or drinking so let's see what the main courses for souvenirs are:

Hungary is at the northern frontier of the grape growing area of Europe. The leading wine brand is the world-famous Tokaji Aszú from the Tokaj region. This is a sweet wine made from "nobly rotten" (late harvest) grapes. Besides wine, pálinka is also a popular choice. It is an old traditional spirit distilled from fresh fruit (apricot, cherry, pear, plum, strawberry or wild fruits) with an alcohol content of at least 37.5 %. This trademark has several restrictions in order to produce perfectly "official" drinks. Champion manufactures are: Bolyhos, Bestillo, Panyolai, Szicsek and Zsindelyes; some of them also sell organic jams from the same kinds of fruits.

Paprika, another speciality of Hungary, is a kind of red pepper which looks a bit like, but tastes very different from, chili. There are hot (erős) and delicate (édes) variants. They are used for many kinds of dishes which you can sample during your stay here. In souvenir shops you can find paprika powder in packages or dried paprika garlands.

If you stay in Hungary you must try some of the many kinds of Hungarian sausages. The no. 1 sausage is definitely Pick téliszalámi. The south-Hungarian brands (Gyulai, Csabai) are a good choice for the sausage fan, or in whole-food stores you can buy mangalica sausages. Mangalica is a rather hairy pig bred in a perfectly natural environment.

For those with a sweet tooth, marzipan may be a good choice. A famous trademark marzipan is Szamos. You can find almost any flavour and form you can think of, from plain blocks to bonbons stuffed with liqueur, chocolate or fruit. You must also try the previously mentioned Túró Rudi.

Re-union party

This evening we will be able to admire the picturesque view of Buda Castle (also a World heritage site), the Fishermen's Bastion, Margaret Island, the Chain Bridge etc. from the Danube, as the re-union party will be organised on the "Európa" river boat. As a river conference ship of this scale exists nowhere else on the continent, it will add a new, unique sparkle to the hospitality for which Hungary is deservedly famous. Having discussed chemistry enough with the mentors, you can relax and just enjoy the party!

(Kontsek András)

Looking back on the practical exam

Two days ago the students had to face the practical exam for which they had studied hard and prepared thoroughly. For my greatest surprise and astonishment books and notes could be seen in almost every hand even the very last day before the exam. According to the technicians who helped the students in the laboratory, it was a great experience to see talented young people from so many nations working together and competing with each other.

No wonder, thus, that the students enjoyed this day a lot, since they finally had the chance to show how brilliant and well-prepared they are. But let's see their opinion about the practical exam.

USA

Q: The first part of the competition is already over so it is high time for me to ask you how you feel about it…

A: Well, our feelings are mixed and complex. On the whole, we can declare the tasks were way more difficult than those of the previous year. Maybe it is a because of the high level Hungarian education… As to the exercises, the first in which we had to acetylize α-D-glucose with acetylanhydride and then isomerize it to β-D-glucose was a piece of cake for us. The second one was a harder task. It was a titration exercise with which we finally could cope. The real hardships came with the third exercise, namely qualitative analysis of cations and anions together. The main problem with it was the shortness of time, I think, though I am not sure that I could have managed with it given we had at least three hours. In my opinion, it was too complex.

Bulgaria

Q: Let me ask you about your overall feelings concerning the practical part of the competition. Was it hard for you, did it match your expectations or was it something completely different from what you had been preparing for?

A: All I can say is that the exam was a really challenging but also an enjoyable one. The exercises were not much more difficult than what we had previously expected. Actually the only negative thing that I can point out is that the time was a little bit too short.

Q: From among the three problems, did you have a favorite or did you have one that you especially disliked?

A: Dislike? Well, no. But I liked the third task very much. You know it was qualitative analysis and we had practiced it a lot in the chemistry classes at school, so it was particularly easy for us.

Cyprus

Q: How do you feel about the practical exam? On the whole did you find it difficult or was it easier than what you had expected?

A: This year's tasks were not very hard. The greatest advantage of them was that the equipment we had to use was simple and we did not have to work with difficult high-tech laboratory instruments as it happened last year.

Q: And what do you think about the results?

A: I know it is a competition still I do not think that the results are so important. We have come to participate, not to win. What matters is that we have a good time here and give the best of our knowledge, winning the competition is much less important for us.

Curiousity of the day

Various insects spend practically their entire life on water surface. They skate on the surface layer of water on their hydrophobic legs and capture other insect fallen into water. They in fact utilize the surface tension and stay afloat. Some species however apply additional trick: when another insect threatens our hero it ejects surfactant which decreases the surface tension, hence the attacking insect would sink if it tried to approach the clever water skater. On the other hand the escaping victim gains additional speed from the edge of the spreading surfactant layer. What do you think, can these insects jump on the surface?

Did you know…

that 4 years ago within one day all the famous and – at least for Hungarians – quintessential paprika powder disappeared from each and every shelf of all the Hungarian shops, supermarkets and restaurants? Imagine Italy without pasta, the USA without hamburgers, Japan without raw fish or Bohemia without beer – that was Hungary without our beloved paprika! No goulash stew, no chicken paprika, no fish-soup, no red spicy sausages, no life! Hungary was paralyzed! The reason was that some imported paprika powder contained a poisonous substance, aflatoxin, produced by a fungus. This paprika had been mixed with the original, unique Hungarian paprika powder and the hybrid arrived at the distributors. Later the total ban was revoked, but we still remember the hard times in those days. Hungarians in fact are so devoted to paprika that they often use it for serious research. Take for instance Mr. Szent-Györgyi Albert as an example. He was interested in the chemistry of cellular respiration. He identified L-ascorbic acid as a key element in these processes. Nowadays we know this compound as vitamin C. For his isolation experiments he used a huge amount of paprika as the source of vitamin C. The successful use of this supply of paprika landed him in Stockholm for the 1937 Nobel Price in Medicine. So it is a good occasion for you to taste paprika while you are here, in Hungary!

(Stirling András)

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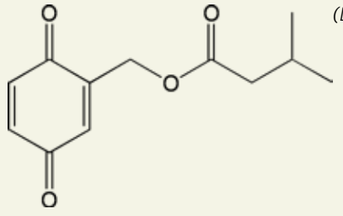
Today's programme

Students		Mentors and Scientific Observers		Guests	
07:00-09:00	Breakfast	07:00-09:00	Breakfast	08:00-09:00	Breakfast
08:40	Departure for Visegrád	08:00-12:00	Corrections	09:00-17:00	Visit to Esztergom and Visegrád
11:45-13:15	Medieval knight show	12:00-13:00	Lunch	17:00-21:30	Medieval knight show and dinner
13:30-15:00	Lunch	13:00-15:30	3rd Jury Meeting	21:30	Departure for the hotel
16:00-18:15	Visit to the Open Air Museum and folklore program in Szentendre	16:00	Departure for Visegrád		
18:15-19:00	Folk-dance experience	17:00-21:30	Medieval knight show and dinner		
19:15-21:15	Dinner	21:30	Departure for the hotel		
21:30	Departure for Gödöllő				

Molecule of the day

Gentisyl quinone isovalerate was recently shown to be the sex pheromone of the German cockroach *(Blatella Germanica)*. This is the most common cockroach species around the world and is often responsible for allergies and the spread of a number of different diseases. Female cockroaches emit the pheromone to attract males. The American scientists who made the discovery showed that the synthetic version of the compound has the same effect and could be an important component of future pest control agents.
(*Science,* **2005**, 307, 1104)



(Lente Gábor)

A simple riddle

What weapon can you make of chemical elements Potassium, Nickel and Iron? (KNiFe)

(collection of J. Verhagen)

Useful expressions

Jousting tournament	Lovagi torna
Knock out	Kiütés
Ouch, that must have hurt	Aú, ez fájhatott
I want to do it too	Én is akarom csinálni
I'm with the group	A csoporttal vagyok
Proverbs:	
Fortune favours the brave	Bátraké a szerencse
[One can do] more by wisdom than by force	Többet ésszel, mint erővel
He was carved from hard wood (He's tough)	Kemény fából faragták
Running is disgraceful but useful	Szégyen a futás, de hasznos
If there is no horse, a donkey will do as well	Ha nincs ló, jó a szamár is

Curiousity of the day

Ca. 56 metric tonnes of liquid gallium (m.p: 29ºC) have been used to detect solar neutrinos (ν) in the nineties within the framework of a Russian-USA collaboration. In this experiment the scientists counted the number of Ge atoms produced in the reaction: $\nu + {}^{71}Ga \rightarrow {}^{71}Ge + e^-$. This project indeed gained remarkable attention: once armed thieves tried to steal the whole pool of ultrapure liquid gallium.

(Stirling András)

Weather

Today will not be particularly hot and you can expect some rain too.

Colophon

Catalyzer
Journal of the 40th International Chemistry Olympiad
Issue No. 8 July 18, 2008
Editorial team: Darvas Mária, Jagasics Éva, Magyarfalvi Gábor, Stirling András, Túri László, Vass Márton, Jon Baker
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40th International Chemistry Olympiad
2008 Budapest, Hungary

Catalyzer

Issue No. 8 – Friday 18 July 2008

Visegrád & Szentendre

Today we are going to take a trip to Visegrád and Szentendre. Visegrád is the smallest town in Hungary, but as you will see, a really charming one. It is located 43 km north of Budapest, on the right bank of the Danube. Its name means high fortress. The town has been populated since the New Stone Age by Celtics, Germans, Romans, Avars, Hungarians, and it was the seat of the Hungarian Kings between 1325 and 1405. It gained international importance in 1335, when King Károly Róbert invited the Kings of Poland and Bohemia to Visegrád to a commercial and political conference. Since 1991 this old alliance has been working again. Its members, Hungary, Poland, the Czech Republic and Slovakia, are called the "V4" or "Visegrád Four". The Royal Palace, which we will certainly visit, is the place where the first meeting of the Visegrád Group took place. It flourished in its greatest splendour during the reign of King Mátyás at the end of the 15th century. He had the whole Palace refurbished in late Gothic style. The Italian Renaissance architectural style, which appeared in the Palace decoration, was used here for the first time outside Italy. In addition to the Palace, the medieval castle and the Citadel are now open to the public. Along the bank of the Danube we can take enjoyable walks; the view from the Danube bend and the surrounding hills is marvelous, and the medieval knight shows are always exciting.

Another tourist attraction in this region is Szentendre, a peaceful little town, with stunningly clean air. It is famous for arts and museums and is home to the Hungarian Open Air Museum exhibiting the folklore, architectural characteristics, culture and traditions of the country. It is situated in the unique and natural surroundings of the Duna-Ipoly National Park. Walking around the museum „villages", visitors can imbibe the atmosphere of the 19th century Hungarian countryside. The authentically furnished rooms, the pieces of furniture, household equipment and textiles, toys, churches, gravestones (in the cemetery) and mills recall the everyday lives of earlier inhabitants. In Szentendre, there are a further 14 museums and art galleries acquainting visitors with the rich historical past and life teeming with arts. The town has been the home of many generations of Hungarian artists. There are many shops and restaurants catering for visitors. Have a nice day in the Danube bend!

(Rónaszéki Nóra)

The three trials – fairy tale

Part 2

...Encouraged by their success in the second trial the brave youngsters waited impatiently to see what that mystic very hard third trial can be. The day between the two trials was spent with – besides impatient and exited waiting – playing various games. Some of the participants - namely the members group from India- still remember how vividly this day was spent. When I asked them about it one of them told me the following:

'I liked this day very much, it was wonderful to play with young men from so many nations. I remember the game I liked the most, it was archery. The other games were also really exciting, for example the memory game.'

Then I asked them if there was any game that they already knew or was especially easy for them, for which another member of the group answered what is written here:

'The game with spices was easy and it was a really good idea to get fake money if I won the game'

So in one word that day was memorable for the young men but good times do not last forever, and the day of the third trial finally arrived. The youngsters woke up with the rising sun, some of them excited, the others rather nervous. In defiance of the traffic jams and other monsters of Chemilia their carts took them to the place of the final trial. They faced the trial successfully the best received the promised goods and he lived happily ever after...just like those who did not win the competition...

Attention

We are looking for a grey wallet which was lost by a member of the Switzerland team at the theoretical exam.

The theoretical exam- a view from the exit door

I asked the students just after having left the room where they had sat for the theoretical exam exhausted and tired, to tell me about their feelings concerning the test.

Iran

Q: How are you feeing now?

A: I am so tired that I cannot feel anything...

Q: Yet can you say a few words about your feeling concerning the test?

A: It was very hard, so tough that I got a shock on seeing the problems.

Q: Were the calculations too hard?

A: No, the calculations were actually all right but there were many-many formulae that I did not know.

A: Yes, and the time was too short.

Q: How did you prepare for it?

A: We were selected a year ago already and we have been training for it since then, and now it seems that we only wasted our time.

Q: I am really sorry about it. Do you have any other comments?

A: Well we do not think that we will get a medal though we are very glad to be here.

Korea

Q: How are you feeing now?

A: I have a headache, it was so long.

Q: What were the problems about?

A: They were basically calculations and problems related to the practical exam.

Q: Did any of the problems surprise you, so was there anything unexpected in the test?

A: No, not at all.

Q: So everything went well which means you were all well-prepared, but how did you achieve this?

A: We are from the same high-school and we did experiments in the laboratory together. We had an intense training course as well.

Q: Do you have any other comments?

A: Yes, we are expecting a gold medal...

A: ...rather we hope to get it...

Did you know...

that many music historians think that the mineralogist Ignatius Born, an acquaintance of Mozart, was the model for the benevolent priest, Sarastro, in his opera The Magic Flute? Born was born as a subject of the Hungarian Crown and later became a key figure in the administration of the mines of the Habsburg Empire. His greatest chemical achievement was the perfection of the extraction of gold and silver by amalgamation with mercury. To present his method he organized the first international "chemistry" conference in 1768 at the Mining Academy in Selmecbánya. The participants founded an international intellectual society (with James Watt, Lavoisier and Goethe later becoming members). One of his coworkers, fellow freemason Johann Metzler, supposedly contributed not only to the amalgamation experiments, but also to the libretto of The Magic Flute. Metzler even played a minor role in the first performance of the opera. Later he travelled much gathering mineral specimens – he located the cryolite Na_3AlF_6 on Greenland that would later become essential in the production of aluminium. Metzler died as a professor of mineralogy in Ireland. The crystal structure of cryolite was eventually determined in 1937 by Náray-Szabó István, one of the first systematizers of X-ray structures. Náray-Szabó was a coworker of Bragg in Manchester but his career was cut short during the communist takeover in Hungary when he was imprisoned on false allegations for his stance on democratic principles.

(Magyarfalvi Gábor)

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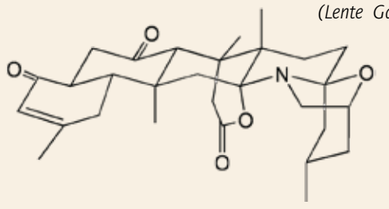
Today's programme

Students		Mentors and Scientific Observers		Guests	
06:30-07:45	Breakfast	07:00-09:00	Breakfast	08:00-09:00	Breakfast
08:00	Departure for Eger	08:30-16:30	Arbitration	09:00-18:00	Visit to Eger and Szalajka Valley
09:30-11:15	Sightseeing in Eger	12:00-13:00	Lunch	18:00-19:00	Dinner at the hotel
12:15-12:35	Travel on the small train in Szalajka Valley	18:00-19:00	Dinner		
13:45-15:30	Lunch	20:00-	4th Jury Meeting		
15:30-17:45	Free time				
18:00	Departure for Gödöllő				
20:00-22:00	Dinner				
22:00-02:00	Disco				

Molecule of the day

Norzoanthamine, an alkaloid originally isolated from the see anemone species Zoanthus, is a promising drug candidate for the treatment of leukemia. However, its natural availability is very limited. This problem has been overcome by Japanese researchers who developed a synthetic route to norzoanthamine from commercially available chemicals. The synthetic route involves 41 individual steps and gives an overall yield of 3.5%. Although this might seem a rather low yield overall, the average step-by-step yield was an impressive 92%.
(*Science,* **2004,** 305, 495)

(Lente Gábor)



Though old chemists never die, just fail to react, let us see some of their last words:

1. And now the tasting test...
2. ...first acid then water...
3. Let us see the detonating gas problem...

(collection of J. Verhagen)

Useful expressions

Can I have some wine?	Ihatok egy kis bort?
Red/White	Vörös/Fehér
Sweet/Semi-sweet/Dry/Semi-dry	Édes/Félédes/Száraz/Félszáraz
My legs hurt	Fáj a lábam
Let's sit down	Üljünk le
What are you doing tonight?	Mit csinálsz ma este?
That's none of your business	Semmi közöd hozzá
Would you like to see my stamp collection?	Megnézed a bélyeggyűjtemé-nyem?
It's party time	Buli van
Would you dance with me?	Táncolsz velem?
What happened?	Mi történt?
I love you	Szeretlek

Curiousity of the day

Winkler Lajos, the famous analytical chemist, after a long day was going home at early morning. He noticed a street sweeper as he swept back and forth, to and fro the dust, making a big dust cloud but obviously without any result in cleaning the way. Winkler warned him: Sir, you leave all the dust on the road! He answered resignedly: And what about the dust you have breathed in? Taken aback and defeated, Winker withdrew, but later he often invoked this story as an example of a clear analytical chemistry way of thinking.

Weather

It seems that at last today the weather will favor us. Let's hope it will be a nice sunny day!

Colophon

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40th International Chemistry Olympiad
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Catalyzer

Issue No. 9 – Saturday 19 July 2008

Eger, Szalajka-völgy

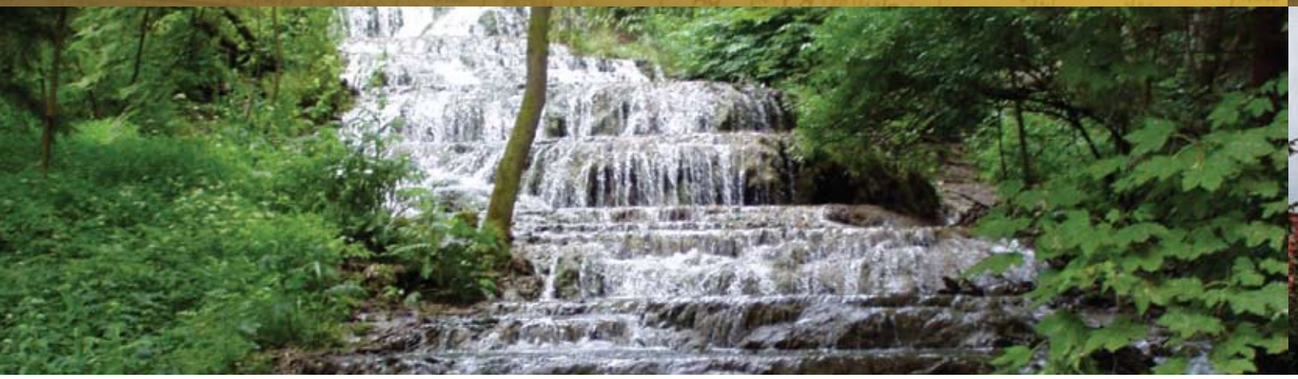
Today's program takes us to the North-Eastern part of Hungary where we can have a glimpse of a famous spot well-known to all Hungarians. Eger is a variegated city near the Bükk Mountains and the river Eger. During the early Middle Ages the area was inhabited by German, Avar, and Slavonic tribes. It was taken over by the Hungarians in the 10th century. St. István, the first Christian king of Hungary, founded an episcopal see in Eger. The main event which gives the town its importance in Hungarian history is the battle fought against the conquering Ottomans in 1552. (This has inspired an adventure-filled novel by Géza Gárdonyi entitled "Egri csillagok" – "The Stars of Eger"). A tiny complement of 2000 defenders achieved a victory that is still often recounted in Hungary. The medieval castle offers a wide range of programs and tournaments; delicious dishes help revitalize fatigued visitors.

Eger itself is not only famous for its battles but has a peaceful side as well. The immense Main Church and the impressive Curia of Archbishops increase the splendour of the city; in addition to the Minaret and the Lyceum, they are well worth a visit. There are a few more intriguing places to visit, such as the Turkish Baths and other spas. One is almost obliged to taste the reputed local wine, Egri Bikavér (Bull's Blood). This fragrant, aromatic and rather harsh wine is renowned the world over; consequently it has become a hungaricum.

There is a valley not so far from Eger, called Szalajka. Its name refers to a forgotten profession, glaziers who used potash (K_2CO_3, Latin sal alcalicus) to make glass. The bed of the local stream is dammed for the sake of a school of trout that are bred here. The valley is also known for its historical excavation in 1947, when a complete prehistoric cave was uncovered. The unique findings in Cave Szeleta provided an insight into the life of Cro Magnon Man, who appeared about 35,000 years ago. The barns of Castle Pallavicini are the home of Lipicai stud horses, where visitors can observe an exhibition presenting everything about these beautiful animals.

The traditions of the palóc ethnic group are preserved in Hollókő, a lovely village consisting of a single street. Girls and boys proudly wearing traditional costumes are the symbol of this region, which, together with its peasant houses, were named by UNESCO as a World Heritage Site in 1987.

(Oláh Máté)



Interview – World traditions

Yesterday we visited the cradle of Hungarian folklore to show you how rich it is and inspired by this certainly all of us want to get acquainted with other traditions as well.

Argentina

Q: What are the most famous traditions of your country?
A: Well, you probably know the tango very well, which is a beautiful dance originating from Argentina. We are really proud of it?
Q: What else can you mention, any traditional food or drink that you have in Argentina for instance?
A: Yes we have the mate which is a kind of tea that was drunk originally drunk by shepherds.

Greece

Q: Can you mention any tradition that is specific of Greece, a thing that all visitors must try?
A: Nightlife... we are famous for it. And also laughter, laughter is everywhere in Greece. But to talk seriously we are famous for our hospitality.
Q: And can you tell me for instance a kind of food that you would offer for a visitor?
A: Suflaki, which is a kind of meat, it is delicious.

Malaysia

Q: Could you tell me what is the most famous tradition or holiday in your country
A: It is probably Hari Raya Aidilfitri, a two-day-long annual religious festival. On these days we go to the mosque in the morning and then eat delicious dishes at home. Everything is calm that time of the year the streets are so abandoned on these days that one could even sleep in the middle of them.

Apology

In the issue of 15th of July I have made mistake in one of the interviews for which I would like to apologize.
First of all, the Iran group told me that they were very happy to be here at the Olympiad, no matter what their results would be.
On the other hand, in the interview with the group of Pakistan and Iran I stated that the Pakistan group had been preparing for one year, which was a misunderstood statement, but of course, they did not prepare more than two weeks in an organized manner, following the rules of the Olympiad.
Once more I apologize for making this mistake.

Did you know...

that poppy seed is a mainstay of Central European sweets despite the use of the plant as a source of narcotics? The dry seeds used in the kitchen do not contain high amounts of psychoactive alkaloids, so the cakes are safe to consume, although sensitive drug screening procedures can give positive results after eating too many poppy sweets. Most illegal drugs are made from opium, the dried sap of the unripe poppy pods. It was a Hungarian pharmacist working in rural Hungary, Kabay János, who developed and patented the extraction of morphine alkaloids from dry poppy straw in the 1920s. This process avoided the use of opium and the seeds could still be harvested. Hungary is today still a significant producer of legal morphine alkaloids.

...and that...

it was a professor of chemistry working at the faculty of veterinary science in Budapest who first assembled a galvanic cell that provides electricity from an endothermic reaction? This finding of Bugarszky István was an important step in establishing free energy as the key quantity when assessing the spontaneity of reactions. Question 26 in the preparatory problems is based on the experiments of a graduate student working on this reaction at the time. It is rather unusual today, but the student, Dávid Klein, published his results alone as a single author.

(Magyarfalvi Gábor)

Main sponsors:

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Today's programme

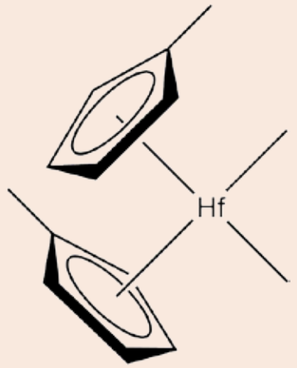
Students		Mentors and Scientific Observers		Guests	
08:00-10:00	Breakfast	07:00-10:00	Breakfast	07:00-10:00	Breakfast
09:00-12:00	Free time	08:00-12:00	Free time	08:00-12:00	Free time
12:00-13:00	Lunch	12:00-13:00	Lunch	12:00-13:00	Lunch
13:30	Departure for ELTE University	14:00	Departure for ELTE University	14:00	Departure for ELTE University
15:00-17:00	Closing Ceremony	15:00-17:00	Closing Ceremony	15:00-17:00	Closing Ceremony
18:00-22:00	Banquet at the Railway Museum	18:00-22:00	Banquet at the Railway Museum	18:00-22:00	Banquet at the Railway Museum
22:00	Departure for Gödöllő	22:00	Departure for the hotel	22:00	Departure for the hotel

Molecule of the day

85 years after Dirk Coster and Hevesy György, Hungarian Nobel prize winner discovered hafnium in zircon by X-ray spectroscopy, semiconductor industry also became interested in the outstanding properties of hafnium oxide. As the size of logical gates is reduced, the problem of controlling the on and off states of the channel arises because of increasing leakage current. HfO_2 has a dielectric constant about seven times greater than that of SiO_2 used so far. The insulator film on the gate can be prepared with the CVD (chemical vapor decomposition) technology from volatile organometallic precursors such as tetrakis(ethylmethylamino) hafnium, or the novel, thermally more stable bis(methyl-η^5-cyclopentadienyl) dimethylhafnium.

(*Advanced Semiconductor Manufacturing Conference,* **2007**)

(Vass Márton)



Useful expressions

What should I wear tonight?	Mit vegyek fel ma este?
It looks good on you	Ez jól áll neked
I got a gold/silver/bronze medal	Arany/Ezüst/Bronz érmet kaptam
I'm so happy	Olyan boldog vagyok
Could have gone better	Lehetett volna jobb is
Can I take a photo?	Készíthetek egy képet?
I'm starving	Éhes vagyok
I want more	Kérek még
What's the dessert?	Mi a desszert?
It was very delicious	Nagyon finom volt
See you soon	Viszlát
I don't want to go home	Nem akarok hazamenni

The motto of the day

Chemistry is all about getting lucky.

(R. Curl)

Photos and reports about the Olympiad can be found at

» **http://cenblog.org (Linda Wang riportja)**
» **www.balintgilicze.com**

Weather

Today the temperature will be pleasantly warm but we can also expect some rain.

Colophon

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Catalyzer

Issue No. 10 – Sunday 20 July 2008

Closing Ceremony and Banquet

Finally the day of announcing the results and prizes has come and after the excitement of the closing ceremony we well have a unique place hosting the banquet, namely the Hungarian Railway Museum. The vast roundhouse will change into a sparkling ballroom for tonight and the rails give their place to the dance floor for the pleasure of those who want to shake it a bit.

The foundation-stone of the museum was laid in 1999 on the site of the former North Depot of Budapest and after many months of reconstruction, Europe's first interactive railway museum opened in July 2000, displaying over a hundred vehicles and equipment of varying ages on an area of over 70.000 m². The 34 bays of the roundhouse built in 1911 provided an ideal home for the vintage fleet, which includes the oldest operating steam engine from 1870 and the legendary Árpád railcar from 1934, which sped from Budapest to Vienna in under three hours. The gem of the collection is the elegant teakwood dining car built for the Orient Express in 1912. Twice a year the legendary train also pays a visit to Budapest. On top of the vintage fleet the museum features railcars, self-powered rail cars and hand-carts, inspection cars, steam cranes, snow ploughs and other curiosities. The exhibition shows the entire history of the railways from the steam engines to the powerful electric engines of today.

Many of the trains are parked outside the roundhouse in a beautifully landscaped green area, where there is also a chance to try the old machines out: visitors can drive a steam engine, travel in a car converted for rails, operate a hand-cart, ride on the turntable and on the horse tram. The simulator offers a virtual experience of driving the most powerful Hungarian electric railway engine, using the original equipment, while the rail-cycle challenges one's sense of balance. From April to October, a vintage diesel shuttle train runs between Budapest's Nyugati Station and the museum.

(Vass Márton)

The program of the Closing Ceremony:

» Performance of Four Fathers Quartet

» Film: Maestro

» Speech of Jung-Il Jin, President of IUPAC

» Performance of Four Fathers Quartet

» Speech by Greiner István, vice-president of the Hungarian Chemical Society and Deputy Director for Research of Richter Gedeon Plc.

» Accordion and brass winds duet by the Szabó Csaba and Ernyei László

» Evaluation of the results

» Performance of the Four Father quartet

» Distribution of awards and special prizes

» Speech of Kotschy András, President of the Organizing Committee of the 40th IChO

» Handing over the IChO Flag and speech by Peter Wothers

The Four Fathers Quartet was founded in 1995. They sing **"a capella"**, which means that they perform without the accompaniment of musical instruments. For years they have been singing in the **Honvéd Male Choir**, two of them are members of this ensemble even today. In 2002 the two other members transferred to the **National Choir**, where they still work. The repertoire consists of their favourites: the American music of the 1920s and 30s, the so called **Barbershop Style**, the adaptations of evergreens, Hungarian hits and spirituals.

The Szabó-Ernyei duo is a peculiar formation with the unusual combination of brass winds and accordion borrowing a unique sounding to their music. The two musicians could match a whole ensemble with their virtuosity. They mostly play Baroque works with their special scoring, often appearing at scientific or innovation events, maybe because their music is strongly innovative on classical bases.

Interviews – the Olympiad from the participants' point of view

The Olympiad is over, the only thing that remains from the program is the Closing Ceremony where the awards will be given out. Certainly this week will be memorable for all of you, but I am also sure that you have been moved by different things. I asked some of the groups about their opinion on the 40th IChO:

Japan

Q: First of all I would like to know how you feel about the Olympiad as a competition?
A: It was difficult still it was a very interesting competition. I enjoyed it very much.
Q: What result do you think you have achieved?
A: Well I would be really happy with a silver medal, though I suppose I am going to get a bronze medal.
Q: Now to talk about the free time activities, I am curious about which program was your favorite?
A: The trips were nice, but I preferred day spent in the park playing games.
A: ...and football, it was great.
Q: Last week you had the opportunity to taste traditional Hungarian food. What is your opinion about it?
A: I liked Hungarian food, but the rice with yoghurt [milk-rice (the editor)] was strange for me, really, but I liked it.
Q: Do you have anything else to share with your companions?
A: I was surprised that most students were very fluent in English, my English also improved, and it was good to be together with people with so many nations.

Ukraine

Q: First of all I would like to know how you feel about this Olympiad as a whole?
A: It was very good to be here. The rooms were nice, the whole hotel was beautiful, the meals were tasty, really, I liked it very much.
Q: What about the competition? What result do you think you have achieved?
A: I feel that the exams were good and not too difficult. The theoretical test was a little bit harder for me.
Q: Do you think that you will be awarded with a medal?
A: I hope so.
Q: Now to talk about the free time activities, I am curious about which program was your favorite?
A: I liked everything, all the trips were wonderful and exciting.
Q: How did you like, for instance, the tournament yesterday?
A: It was amazing I have never seen such a show before.
Q: Last week you had the opportunity to taste traditional Hungarian food. What is your opinion about it?
A: Everything was tasty, I liked it very much.
Q: Do you have anything else to share with your companions?
A: It was very nice to be here in Hungary and I will never forget this Olympiad.

Did you know...

that Furka Árpád and his colleagues at Eötvös Loránd University developed a new synthetic method that revolutionized pharmaceutical research and drug discovery and led to the foundation of a new branch of science called combinatorial chemistry? Furka Árpád graduated first as a chemistry teacher then as a chemist from the University of Szeged and became a professor at Eötvös Loránd University. His "split-mix synthesis" strategy, conceived in 1982 and published in 1988, made it possible to prepare more compounds in a week than have been made in the previous history of chemistry. The possibility to prepare an almost unlimited number of compounds captured the imagination of pharmaceutical scientists all over the world. This idea has changed the way how new chemical libraries (collection of compounds) are designed and prepared for subsequent biological activity or functional assays. The method was originally developed for the synthesis of peptide libraries based on the solid-phase synthetic strategy introduced by Prof. Bruce Merrifield at the Rockefeller University.

Subsequently it was adapted for the preparation of all other classes of compounds. Later on he developed the string synthesis procedure at the Advanced ChemTech Inc. (Louisville, KY, USA), which is one of the most efficient methods for preparing discrete compounds in several milligram quantities. The achievements of Prof. Furka have been highlighted by the Széchenyi Prize in 2002. He was the first Honorary President of the freshly formed European Society of Combinatorial Sciences and the chairman of the Eurocombi-1 (Budapest 2001), the first symposium of this society. Combinatorial thinking and the combinatorial methods combined with high-throughput biological screening became so powerful that its use is gradually expanding to fields outside pharmaceutical research like catalysis research, material sciences and evolutionary biology.

(Dibó Gábor)

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40th International Chemistry Olympiad
2008 Budapest, Hungary

Catalyzer

Issue No. 11 – Monday 21 July 2008

Did you know...

that medieval Hungary was the greatest source of gold and silver for Europe, providing a rich source of income for the Hungarian kingdom? The mines in the Carpathian ranges were known in Roman times and were at the forefront of advances in mining technology, geology and chemistry. For example the first peaceful use of black powder, underground blasting, was introduced on February 8th, 1627 in Selmecbánya (German: Schemnitz, Slovak: Banska Stiavnica). This town was the seat of a mining school already functioning in 1735 that was the first institute of technology to receive university status in 1770. The excellent education and the syllabus that introduced chemistry laboratory practices for the first time attracted students and scholars from as far away as South America. The d'Elhuyar brothers, the discoverers of vanadium, and Alessandro Volta also visited the institute.

(Magyarfalvi Gábor)

...and that...

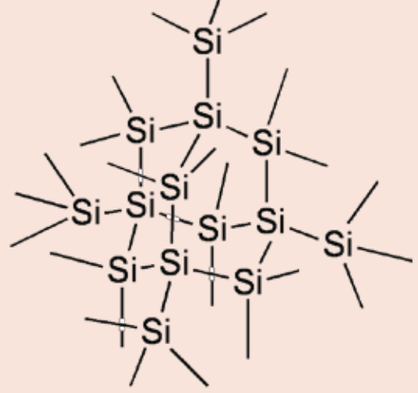
the Danube, our beautiful, majestic river was once a virtually inexhaustible source of gold for many many people? They did what is known as gold-washing professionally for a living. Gold-washing was already a well-known method in Ancient Times to obtain gold for trade. The technique is simple but laborious and very dangerous to your health. What you get at the end of your fatiguing gold-washing day are fine gold particles which are difficult to separate from their accompanying impurities. Separation was accomplished using mercury in three steps. First the gold particles were amalgamated using mercury drops. Then the remaining mercury and the amalgam were separated by squeezing this "solution" manually through a tight cloth. During the squeezing, mercury drops percolated through the cloth while the pasty amalgam remained inside. In the last step this amalgam was heated and after Hg had evaporated, the gold (in the form of a kind of sponge) from the Danube was recovered. From where do you think those people got the elementary mercury to do this job?

(Stirling András)

Molecule of the day

Sila-adamantane is the silicon-containing analog of adamantane. Unsubstituted sila-adamantane itself is extremely difficult to prepare because of the low stability of Si-H bonds. A substituted derivative of the molecule, however, was prepared by Austrian scientists in 2005. Crystalline silicon is an exceptionally important material for the modern semiconductor industry. Sila-adamantane is a molecular analog of the basic structural unit of the Si lattice, and may find widespread application in device miniaturization and molecular electronics.
(*Science,* **2005,** 310, 825)

(Lente Gábor)



The motto of the day

All that glitters may not be gold, but at least it has free electrons.

(J.D. Baemal)

Weather

Today the temperature will be pleasantly warm but we can also expect some rain.

Colophon

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Medal	Name	Country
Gedeon Richter Prize	Yongping Fu	China
Servier-Egis Prize	Yongping Fu	China
MOL Prize	Yongping Fu	China
Commendation	Sarka János	Hungary
Commendation	Li Qian Yeong	Singapore
Gold	Yongping Fu	China
Gold	Li Qian Yeong	Singapore
Gold	Andrey Bogorodskiy	Russian Federation
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