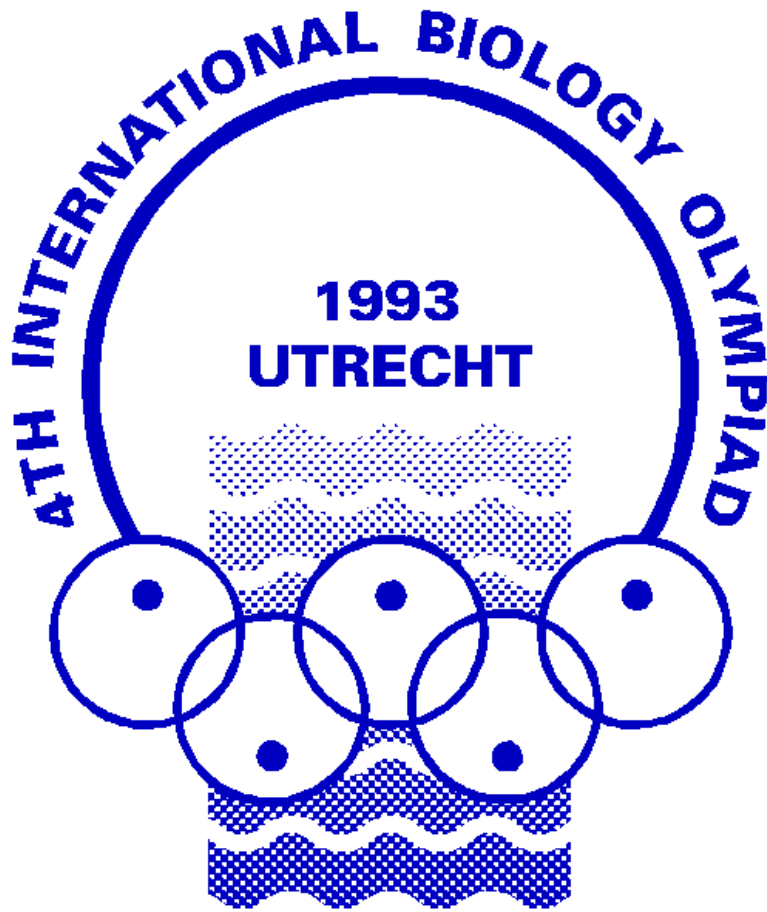


# Report of the 4<sup>th</sup> IBO 1993

## Contents

	Page
The Emblem	2
1 Preface	3
2 Organizers and volunteers	5
3 Sponsors	8
4 Program	10
5 Participating countries	15
6 Review of the tests, results and final ranking	21



*The Emblem*

*For ages the struggle for life in the Netherlands had much to do with a competition between land and water. A good deal of the country is situated below sea level. This is symbolized by the olympic rings in between the waves.*

# 1 Preface

In this book you will find the report of the IVth International Biology Olympiad. The Olympiad was held from 4 to 11 July 1993 in Utrecht, The Netherlands.

This year 15 countries participated with a team, consisting of four students and two delegation leaders. There were observers from 6 countries and of course from the Coordinating Centre in Prague. Then there were the people backstage. In total at least 150 people were actively involved to make this manifestation a success.

With a very small group of only three people, we started the organization: Miss Olga Kok, Drs. J. Morélis, Prof. P. Voogt. We needed some time to realize what an enormous event this was going to be. It meant a year of hard work, coordinating the activities, making the tests, fund raising and arranging a program. In the end numerous people worked hard to get everything prepared in time; the translators, the interpreters, the catering, security, suppliers of the practical facilities.

Preparing the tests was a task in itself. Biologists from the Utrecht University and one from the Agricultural University in Wageningen, have made a big effort to produce an attractive set of problems. We started with the idea to have the tests rounded off in April. But we overlooked some biological difficulties in making a practical test. For instance: our first fertilization experiments with growing maize plants failed completely due to problems with controlling the light intensity conditions. That we succeeded to produce a satisfactory test in time after all, was due not only to the test preparing team, but also to the hard work of mr. C. Loffeld, mr. K. v. Rhee and dr. J. Broertjes. A special thanks goes out to them.

The tests were translated in English and Russian, a job which was finished just before the olympiad started. During the olympiad, the delegation leaders had to translate all this into their native language. An incredible effort for all. And although a few things went wrong, in general it was a very accurately performed task. Every year attempts are being made to reduce the amount of text to translate; let's hope the next organizing countries will succeed better than we did in reducing the pages!

In the social program we have tried to show some of the typical dutch countryside, which means a lot has been done by boat. What more can you wish to happen than 15 nationalities on board of a dutch schooner on the IJsselmeer, singing songs from all the different countries and seventy-five young people exchanging addresses at the end of the week.

Twenty-seven volunteers were active during this week. They were either biology students from the Utrecht University or previous participants of a Biology Olympiad. All of them very enthusiastic and anxious to participate. For the 15 student guides the tasks were quite clear. The others formed a tight group, just out of the visual reach of the participants. They were part of the crew backstage and supervised that the whole program ran as smoothly as possible. The minibusdrivers, the photographers, the olympic daily editors, the people copying during the night till 5 a.m.

They made what sometimes seemed impossible run as smoothly as if nothing ever could go wrong. We appreciated this cooperation very much.

For the organizers this olympiad was an exiting event with many peak experiences. Olga Kok who did a marvellous job expressed it as follows: " I have learned a lot this year. As a newcomer in an established structure, I had to find my position, define my tasks and prove my capability. Organizing this olympiad also gave me the opportunity to cooperate with many different people, in very different skills and professions. I felt like a chameleon at times. At one moment you talk to an important sponsor, the next it's 4 a.m. and I'm behind a copier or addressing the crowd of participants, telling them that the bus will leave at 9.15 a.m. The week was crazy and I loved it."

There are some people that we would like to mention because of their special contribution to the IBO. Prof. Lambers for presiding the international jury.

Mr. Henkens, from the Ministry of Education and Sciences, for the presentation of the prizes.  
Mr. van Lidt de Jeude, alderman for education in the city council of Utrecht, for his last minute arrangement for a reception in the city hall.  
Marjolein de Vries, who must have gone crazy, having to type and illustrate the original tests, while getting so many different versions to work with. It looked very good in the end.  
Margarita Veldhuizen, who managed to be a perfect interpreter at very unusual circumstances.  
Ar den Boer, who spend days and probably nights, after the olympiad was over to send everybody the photographs they ordered.  
Francien Morshuis who did a splendid job in processing the report you are reading now.  
And last but not least Eeske Verhallen, who was a very reliable and indefatigable assistent during the last two months before the IBO started and of course during the the week of the IBO. She has moved mountains and remained motivated when things got a little rough.  
We think we made a perfect team!

Olga Kok  
Hans Moréllis  
Peter Voogt



*Olga and Eeske, the heart of the organization*

## 2 Organizers and volunteers

### **The board of the foundation biology olympiad of the Netherlands**

Drs. J. Morelis, chairman  
Prof. Dr. P.A. Voogt, secretary  
Drs. P.K. Leendertz, treasurer

### **Organizing committee**

Drs. J. Morelis, chairman and fundraising  
Prof. P.A. Voogt, organization as regards contents of the tests  
Mw. O.J.M. Kok, daily organization  
Mw. E. Verhallen, assistant to the organizer

### **Members of the tests teams**

#### ***Theoretical test***

dr. F. Warnaar  
dr. A.F.H. Cremers  
dr. J.H.B. Diederik  
dr. H.H.W. Velthuis  
Miss dr. G. de Jong  
dr. M.A.P.A. Aerts

#### ***Practical test***

dr. F. Warnaar  
dr. R. Bobbink  
dr. H. Poorter  
dr. T. Bongers

### **Chairman of the jury**

Prof.dr. J.T. Lambers



*Olympic VIP's*

#### **Volunteers**

##### **Minibus drivers**

Finley Koolhoven  
Claes Groot  
Mike van der Bruggen

##### **Olympic daily**

Sander Voormolen  
Chantal Wilhelmus

##### **Fotographers**

Ar den Boer  
Jos van der Heijden

##### **Allknowers in the olympiad information center**

Eeske Verhallen  
Marie-José Goumans  
Mariëlle Hodzelmans  
Arjen Threels  
Peter-Bram 't Hoen

##### **Student guides**

Linda de Poorter  
Grietus Mulder  
Sipke Loonstra  
Meeke de Kanter  
Corette Wiereinga  
Aske van Werkhoven  
Henk-jan Schoonebeek  
Jeroen Nijman

##### **Country**

Australia  
Bulgaria  
Germany  
Poland  
Czech Republic  
Slovak Republic  
The Netherlands  
Turkey

Janneke Hendriks  
Rian van de Schoot  
Frans van Dunné  
Ard Schrier  
Claudia Hofstra  
Nathalie Thoonsen  
Nathalie Bouhelier

Belorussia  
Ukrain  
Russia  
Thailand  
China  
Sweden  
Belgium



*Even a volunteer gets sleepy*



### 3 Sponsors

A tribute to our sponsors. Without them it would not have been possible to organize the 4<sup>th</sup> International Biology Olympiad.



**MERCK**



**Gist-brocades**







## 4 Program

### Students program

#### Sunday July 4

Arrival of the delegations  
18.30 Dinner, with instructions about the organization

#### Monday July 5

8.00-9.00 Breakfast  
9.15 Coach leaving from youth hostel for Gertrudiskapel  
10.00-12.00 Opening Ceremony  
12.15 Coach leaving for the Uithof, Bestuursgebouw  
12.30 Lunch offered by the University of Utrecht  
13.15 Coach leaving for the city center  
13.30-15.30 City walk through Utrecht  
15.30-16.30 Tea at the city hall  
16.45 Coach leaving for the youth hostel  
18.00 Dinner at the youth hostel  
19.30 Coach leaving for the theatre  
20.00-21.30 Jan Rauh and his special theatre  
22.00 Coach leaving for the youth hostel

#### Tuesday July 6

7.30 Breakfast  
8.00 Coach leaving for Wentgebouw  
8.30-13.00 Practical test  
13.30 Coach leaving for Arnhem  
14.30 Arrival at Burgers' Zoo in Arnhem  
18.30 Dinner in the Zoo  
21.00 Coach leaving for the youth hostel

#### Wednesday July 7

8.00 Breakfast  
8.30 Coach leaving for Enkhuizen  
10.00 Arrival in Enkhuizen and boarding on the 3-mast schooner the Willem Barentz. Sailing to Lelystad Harbour, visit the VOC-ship the Batavia.  
13.30 Coach leaving for Amsterdam  
18.00 Coach leaving for youth hostel  
19.00 Dinner at youth hostel

#### Thursday July 8

7.30-8.15 Breakfast  
8.30 Coach leaving for the Wentgebouw  
9.00-13.00 Theoretical test  
13.30 Coaches leaving for 1. Unilever, Vlaardingen and 2. Gist brocades, Delft  
14.15 Arrival in Vlaardingen and Delft  
17.00 Leaving for Rotterdam  
17.30-21.30 Trip through the Rotterdam Harbours and dinner on board of the ship  
21.45 Coach leaving for youth hostel

### **Friday July 9**

The whole day the program will be together with the delegation leaders

- 7.30-8.15 Breakfast
  - 8.30 Coach leaving for Enkhuizen
  - 9.45 Arrival in Enkhuizen
  - 10.00 Visiting 1. Zaadunie, 2. Royal Sluijs
  - 13.00 Coach leaving for Harderwijk
  - 14.00 Arrival at Dolfinarium Harderwijk
  - 18.00 Coaches leaving for the youth hostel
  - 19.00-22.00 Barbecue at the youth hostel
- Minibuses are available to take you to the city center or the Biltsche Hoek

### **Saturday July 10**

Morning free

- 12.30-13.30 Lunch at the youth hostel
- 14.30 Coach leaving for the Botanical Gardens
- 15.00-18.00 Closing ceremony and reception with ambassadors and cultural attaches from the participating countries
- 18.00 Coach leaving for the youth hostel
- 19.00 Coach leaving for the evening program....

### **Sunday July 11**

Departure of the delegations

## **Delegation leaders program**

### **Sunday july 4**

Arrival of the delegations  
18.30 Dinner, with instructions about the organization

### **Monday july 5**

8.00-9.00 Breakfast  
9.15 Coach leaving the Biltsche Hoek for the Gertrudiskapel  
10.00-12.00 Opening ceremony  
12.15 Coach leaving for the Bestuursgebouw in the Uithof  
12.30 Lunch offered by the University of Utrecht  
13.15 Leaving, by foot, for the Wentgebouw  
13.30-? Discussion on and translation of practical test  
18.30 Dinner is served in the cantine of the Wentgebouw  
Minibuses are permanently available to take you to the Biltsche Hoek

### **Tuesday july 6**

8.00-9.00 Breakfast  
9.30 Coach leaving for the city center  
9.45 City walk and coffee in Kasteel Oudaen  
11.30 Coach leaving for the Wentgebouw  
Meet the students after the practical test  
13.30 Coaches leaving for Burgers' Zoo in Arnhem  
14.30 Arrival in Burgers' Zoo  
18.30 Dinner in the Zoo  
21.00 Leaving for the Biltsche Hoek

### **Wednesday july 7**

7.30-8.15 Breakfast  
8.30 Leaving for the Wentgebouw  
8.45 -? Discussion on and translation of theoretical test  
12.00-13.30 Possibility to have lunch  
18.00-19.30 Dinner break  
Minibuses are permanently available to take you to the Biltsche Hoek

### **Thursday july 8**

8.00-8.45 Breakfast  
9.00 Coach leaving for Wentgebouw  
9.15-13.00 International Jury session  
13.30 Coaches leaving for 1. Unilever, Vlaardingen and 2.Gist brocades, Delft  
14.15 Arrival in Vlaardingen and Delft  
17.00 Leaving for Rotterdam  
17.30-21.30 Trip through the Rotterdam Harbour and dinner on board of the ship  
21.45 Coach leaving for the Biltsche Hoek

### **Friday July 9**

This whole day the program will be together with the students

- 7.30-8.15 Breakfast
  - 8.30 Coach leaving for Enkhuizen
  - 9.45 Arrival in Enkhuizen
  - 10.00 Visiting 1. Zaadunie, 2. Royal Sluijs
  - 13.00 Coach leaving for Harderwijk
  - 14.00 Arrival at Dolfinarium Harderwijk
  - 18.00 Coaches leaving for the youth hostel
  - 19.00-22.00 Barbecue at the youth hostel
- Minibuses are available to take you to the city center or the Biltsche Hoek

### **Saturday July 10**

- 7.30-8.15 Breakfast
- 8.30 Leaving for the Wentgebouw
- 8.45-13.00 Confirmation of the winners and final results
- 13.00-14.30 Possibility to have lunch and go to the Biltsche Hoek
- 14.30 Coach leaving from hotel for Botanical Gardens  
Those who have decided not to go to the hotel, will walk to the Botanical Gardens
- 15.00-18.00 Closing ceremony and reception with ambassadors and cultural attaches from the participating countries
- 18.00 Coach leaving for the Biltsche Hoek
- 19.00 Coach leaving for the evening program....

### **Sunday July 11**

Departure of the delegation....



*Sailing on the IJsselmeer*

## 5 Participating countries

<b>Delegation leaders</b>	
<p><b>AUSTRALIA</b></p> <p>Andrew Walter P.O. Box 7 Violet Town 3669 tel: +61-57-981301 fax: +61-57-981652</p>	<p>Davey Matthew John XXIII College ANV 0200 tel: +61-62-794501 fax: +61-62-490741</p>
<p><b>BELGIUM</b></p> <p>Michel Asperges Onderwijslaan 87 359 Diepenbeek tel: 011-324108 fax: 011-268199</p>	<p>Madeleine Demonty-Tissot R. de Moortebeek 122 B-1080 Bruxelles tel: +32-2-5221120</p>
<p><b>BELORUSSIA</b></p> <p>dr. Elena Shalapionok Belorussian University fak. Biology/ dept. zoology 220039 Minsk s.Voronianskogo 3,33 tel:785518 (work) 258733 (home) fax: 7-0172-274629</p>	<p>Galina Romanovec 220010 Minsk Ministry education of Republika Belorussia fax:0172-274629</p>
<p><b>BULGARIA</b></p> <p>Prof. Vassil Grigorov Golemanski Institute of Zoology Ruskistr 1, Sofia 1000 tel:359-2-885115</p>	<p>Nevenka Muleshova Sofia University</p>
<p><b>CHINA</b></p> <p>Prof. Wu Xiang-yu Biology Dept. Peking Univ. 100871 Beijing tel:86-1-2552471 fax: 86-1-8321914</p>	<p>Prof. Liu Enshan Biology Dept. Beijing Normal University tel: 2012288-2717 (o)</p>
<p><b>CZECK REPUBLIC</b></p> <p>Prof. dr. Vítězslav Bícík PrFUP Svobody 26 77146 Olomouc tel: +42-68-22451</p>	<p>dr. Jan Stoklasa PrFUK Vinická 7 Praha 2 tel: +42-2-292151/3204</p>

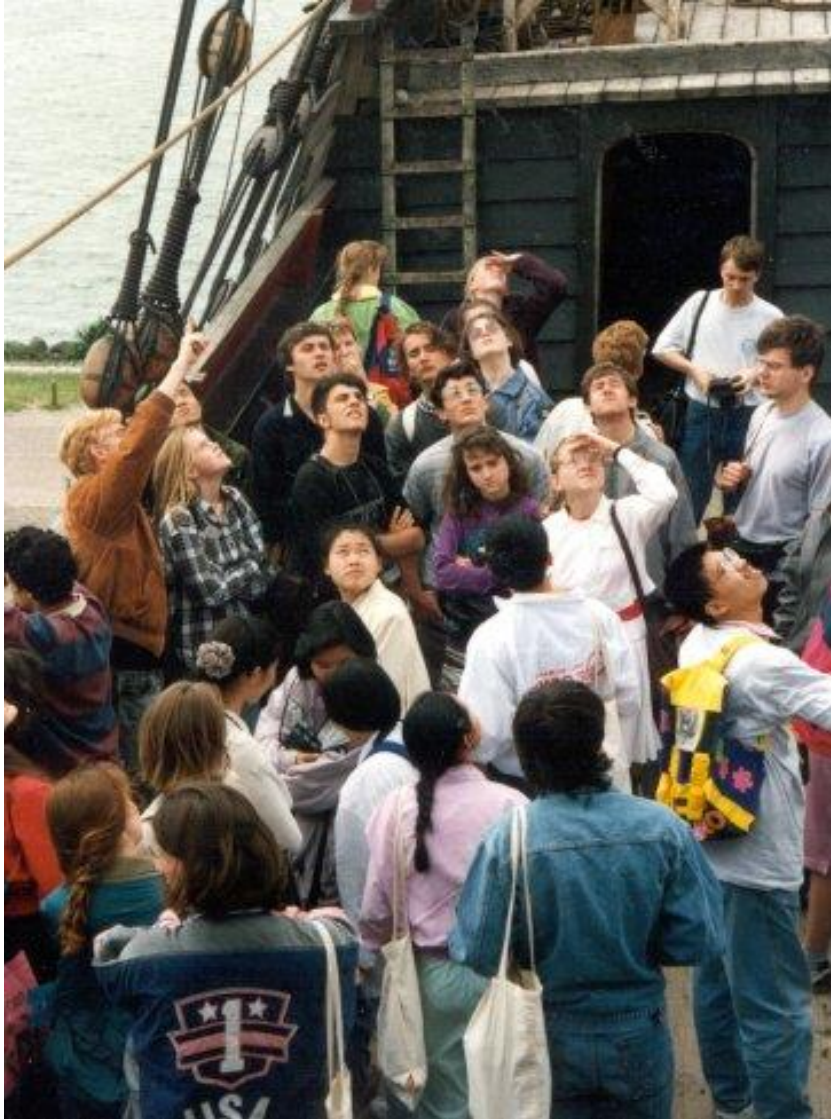


<p>GERMANY</p> <p>Prof.dr. Erwin Zabel Bürgermeister Dahse-Str. 7 0-2600 Güstrow tel: 03843-32443</p>	<p>dr. Annett Hartmann Johannes Vernerstr. 9b 0-1197 Berlin tel:030-6552451 fax:+49-30-6350153</p>
<p>THE NETHERLANDS</p> <p>dr.ir. Kees Bos Drijenlaan 2 6703 HA Wageningen tel:08370-82053 fax: 08370-83146</p>	<p>ir. A. Alblas Hollandseweg 1 6706 KN Wageningen tel:08370-84563 fax:08370-84763</p>
<p>POLAND</p> <p>dr. Jan Fronk Inst. Biochem. U.W. Zwirki i Wigury 93 02 089 Warszawa tel/fax: 48-22-232046/220248</p>	<p>Malgosia Kilen Kgb Felinskiego 15, 01513 Warszawa homephone: 130007</p>
<p>RUSSIA</p> <p>Valeria Kucmenko Ministerstvo obrazovania Rossii Cistoprudnyj bulvar 6 101856 Moskva tel: 7-095-9257812 fax: 7-095-9246989</p>	<p>Vladislav Sivoglazov Marinoj Roschi 3rd proyezd 129246 Moskva</p>
<p>SLOVAK REPUBLIC</p> <p>Pavel Eliás Institute of Botan Slovak Acad. Sci. Dúbravská 14 842 23 Bratislava tel: +42-7-3782722 or 373294 fax: +42-7-371948</p>	<p>dr. Samuel Pacenovsky Hrnciarska 7 04001 Kosice</p>
<p>SWEDEN</p> <p>Andreas Ehn Kohagsv. 11 S-75653 Uppsala tel: 018-324346 fax: 46-18-503510</p>	<p>dr. Monica Fernholm Rösegat. 12 S-78454 Borlänge tel: 0243-29992</p>
<p>THAILAND</p> <p>dr. Sumonta Promboon IPST 924 Sukhumvit Road Bangkok 10110 tel: 2580310-3/203 fax: 662-260-1028</p>	<p>dr. Usanee Yodyingvad IPST 924 Sukhumvit Road Bangkok 10110 tel:662-2183305 fax:662-215-3635</p>

<p>TURKEY</p> <p>Prof.dr. Askin Tümer H.U. Biyoloji Bölümü Beytepe/Ank. tel: 90-4-2352500/1527 fax: 90-4-2352341</p>	<p>Prof.dr. Ali Demirsoy H.U. Biyoloji Bölümü Beytepe/Ank. tel: 90-4-2352500/1378 fax: 90-4-2352341</p>
<p>UKRAIN</p> <p>Alisa Snegur Kiev Observatornaya 21, kv.5 tel:212-36-60 fax: (044)-417-83-36</p>	<p>Nikolaj Tzepukz Kiev Entuziastov 7/3, kv.4</p>
<p><b>Observers</b></p>	
<p>COORDINATING CENTRE</p> <p>dr. Tomáš Soukup Fyziologický ústav CAV Vídenská 1083 142 00 Praha 4 tel: +42-2-4719741 fax: +42-2-4719517</p>	
<p>AZERBEIJAN</p> <p>Mustafa Petek Dervisali mah. Dolapli bostan sok. No.25 34240 Fatih Istanbul Turkey tel:90-1-5346927 fax:90-1-5334192</p>	<p>ICELAND</p> <p>Johann Gudjonsson Nönnustigur 8 220 Hafnarfjörður tel: 354152119 fax: 3541650491</p>
<p>ISRAEL</p> <p>Tamir Pinchas Israel Science Teaching Center Hebrew University GIVAT RAM Jerusalem 91904 tel: 972-2-661774 fax: 972-2-585708</p>	<p>UZBEKHISTAN</p> <p>Memduh Akkus Dervisali mah. Dolapli bostan sok. No.25 Fatih Istanbul Turkey tel:90-1-5346927 fax:90-1-5334192</p>
<p>KAZAKHISTAN</p> <p>Kadir Tuzlak Dervisali mah. Dolapli bostan sok. No.25 Fatih Istanbul Turkey tel:90-1-5346927 fax:90-1-5334192</p>	<p>THAILAND</p> <p>Director of IPST, Prof. Charuni Sutabutr Mr. Choosilp Attachoo Ms. Chantana Anolavup 924 Sukhumvit Road Bangkok 10110 Thailand tel:662-3924021 fax:662-3810750</p>

KIRGIZHISTAN

Cengiz Altuntas  
Dervisali mah. Dolapli bostan sok. No.25  
Fatih  
Istanbul  
Turkey  
tel:90-1-5346927  
fax:90-1-5334192

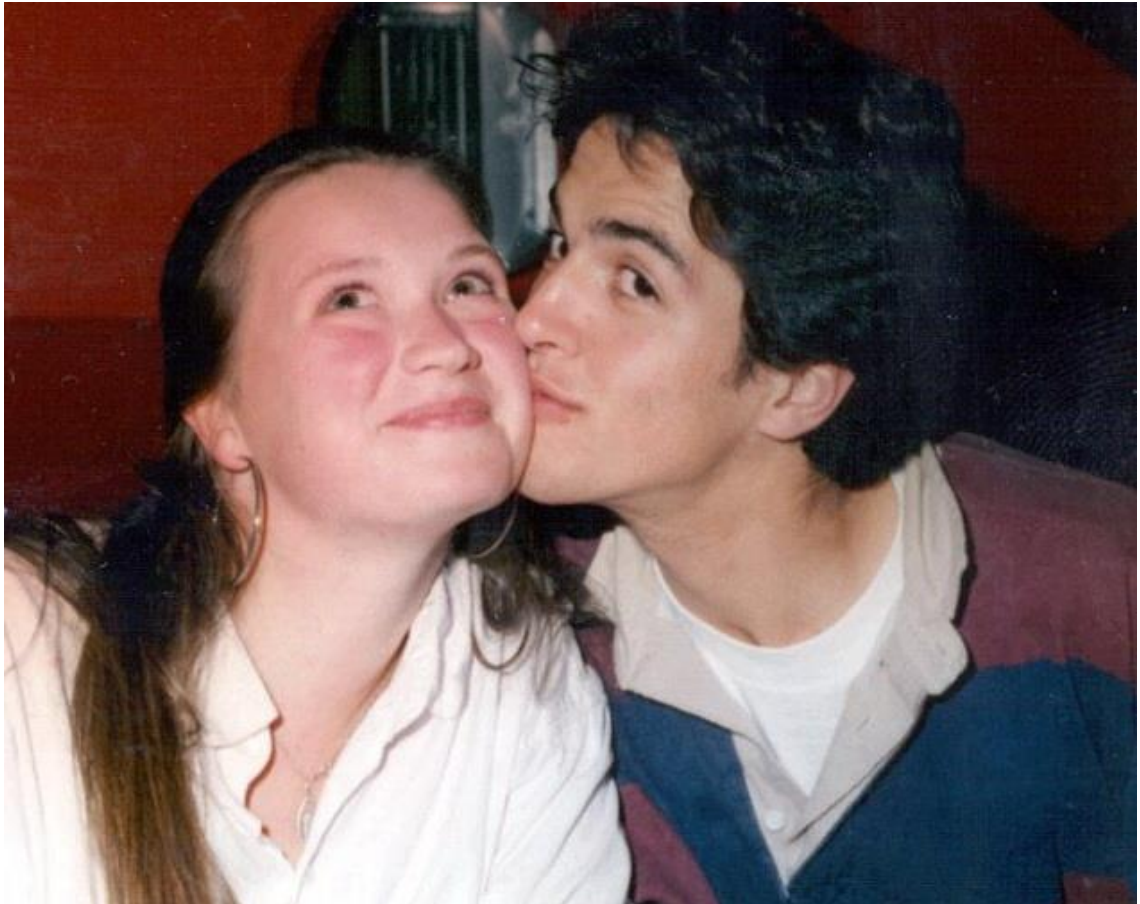


*On board of the VOC ship Batavia  
(replica 17<sup>th</sup> century)*

<b>Students</b>	
<p><b>AUSTRALIA</b></p> <p>Anna Bown Toby Handfield Amanda Henry Amanda Shaw</p>	<p><b>CZECH REPUBLIC</b></p> <p>Stanislav Lhota Ivana Kotorová Pavel Hulva Lenka Kratzerová</p>
<p><b>BELGIUM</b></p> <p>Nico Boon Eva Smets Xavier De Keuleneer Madjid Mansouri</p>	<p><b>GERMANY</b></p> <p>Katja Wurzinger Axel Niebisch Tanja Scheler Ralf Kittler</p>
<p><b>BELORUSSIA</b></p> <p>Elena Knatko Elena Truchatchova Elena Kuzmina Dmitri Petrikovich</p>	<p><b>THE NETHERLANDS</b></p> <p>Stephan Houben Chris Bakker Edith Raats Sander Nijdam</p>
<p><b>BULGARIA</b></p> <p>Tanyi Teneva Petar Shourolinkov Emil Karaulanov Dejan Jordanov</p>	<p><b>POLAND</b></p> <p>Szymon Gomulka Grzegorz Napela Karol Kaminsky Radoslaw Tomalski</p>
<p><b>CHINA</b></p> <p>Xu Xing Liu Yue-Yi Gao Lu Ou Gang Xiao-guang</p>	<p><b>RUSSIA</b></p> <p>Natalia Slokasova Rachmatullin Ramil Michail Kaganski Elena Kvasjnina</p>
<p><b>SLOVAK REPUBLIC</b></p> <p>Miroslav Hric Ivor Svetlankys Andrea Jankacká Lucia Kilárska</p>	<p><b>TURKEY</b></p> <p>Hikmet Köseoglu Inci Asli Sonat Can Kerem Erdön Çagan Hakki Sekercioglu</p>
<p><b>SWEDEN</b></p> <p>Basven-Erik Bartfay Johan Ahlen Magnus Edvardsson Johan Jönemo</p>	<p><b>UKRAIN</b></p> <p>Yevgen Savrasov Dmitro Kovtum Miroslav Rosul Boris Shtonda</p>

THAILAND

Cholodda Vejabhuti  
Maneeratana Nuntarukchaikul  
Warit Utanwutipong  
Saranya Chumsri



*Making friends*

## 6. Review of the tests, results and final ranking

### Results

As in previous years, scores showed a wide range, varying from 290 (72.1%) to 139 (34.6%) points of the total of 402 points attainable.

Previous IBO's showed a tendency to increasing highest scores. (1990, 68.7%; 1991, 81.5%, 1992, 84.9%), but this trend was not continued this year. At least three causes can be indicated:

- \* there has been a strong shift from anatomy and taxonomy towards molecular-, cell- and microbiology.
- \* emphasis has been stronger on insight and interpretation than on factual knowledge. These two changes made the theoretical test more difficult than it used to be.
- \* the scores of the practical test were somewhat disappointing.

Closer analysis of the results shows that the mean score of the multiple choice part (part A) of the theoretical test amounted to 63.7%, with a range from 42.0 to 86.3%. The mean score of the second part amounted to 57.1%, with a range from 20.6 to 82.5%. So the second part strongly discriminated between the competitors. This is also clear from the figure 1.

*Figure 1*

The highest score for the first part was attained by a Chinese (female) student, for the second part by a Bulgarian (male) student, while the highest score for the total theoretical test was attained by a Polish (male) student (82.3%).

The mean score of the practical test was only 97 (48.5%) points of the 201 points attainable, with a very wide spread of the scores. These ranged from 139 (69.2%) to 33 (16.8%) points. (See fig. 2)

Figure 2

Due to the awarding of the same weight to the theoretical and practical test, the scores of the practical part strongly influenced the overall-results. This also happened in 1992 during the third IBO.

As a result of the wide range in the scores, the practical task has strongly discriminated between the competitors. Figure 3 and 4 show the effects of the theoretical and the practical test. From these figures it can be concluded that:

- \* the practical part is discriminating stronger than the theoretical part.
- \* the tasks are complementary and are needed both.

The highest score for the total practical part was attained by an Australian female student.

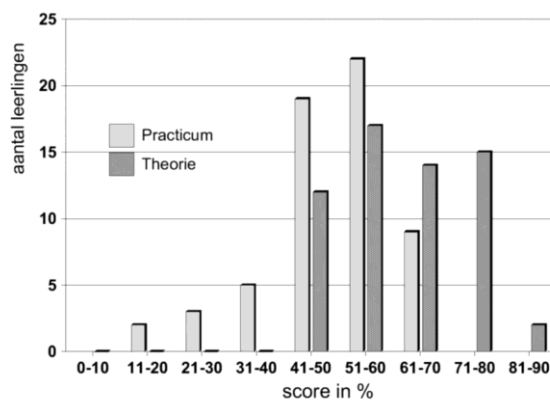


Figure 3

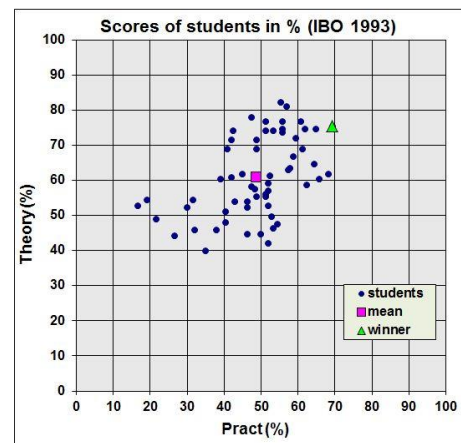


Figure 4

The five parts of the practical task differed from each other in the mean biological disciplines involved. The first part dealt with zoological subjects, nematods, which had to be determined on the grounds of morphological criteria, and to be categorized. From these results conclusions had to be drawn about the effect of manuring on the composition of the nematod fauna.

The second part dealt with the effect of nitrogen gift on dry weight, leaf area and root length of maize plants grown at different nitrogen regimes. Explanations were asked for the differences observed. Essentially this was a plant physiological problem.



In the third part sections had to be made from the maize plants used in the second part and morphological and anatomical differences had to be detected. The students had to find five differences (which were very evident). These differences also comprised the amount of chlorophyll and starch in the sections. From these data conclusions had to be drawn. This part could be best indicated as functional anatomy, connecting pure plant anatomy and plant physiology.

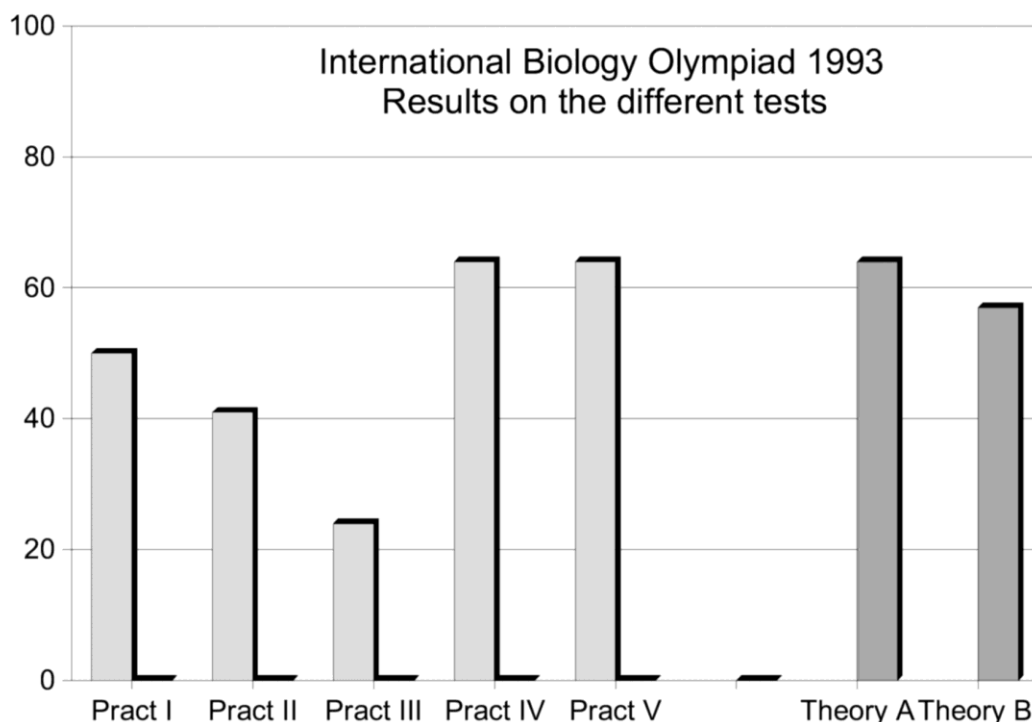
The fourth and the fifth part were more ecological in nature, dealing with intra- and interspecies competition and the effects on biodiversity, respectively.

As to the performances of the students: The ecological parts (four and five) were by far made best, with mean scores of 64.1 and 64.0%, respectively. (See figure 5). The highest scores for these parts were attained by a Bulgarian student (100%) and a German student (91.7%), respectively.

The first part, on nematods, had a mean score of 50%. The highest score on this part was attained by a Dutch student (90%).

The second part, plant physiology, had a mean score of only 41.5%. The highest score on this part was attained by a Dutch student (90.2%).

The third part, functional anatomy, had a poor mean score of 24.4%. The highest score on this part was attained ex aequo by a Chinese, a Belorussian and a Czech student (62.2%).



The poor results of the third part are probably due to the following causes:

First to the open nature of the task: finding differences without any indication.

Second the task to combine plant anatomy and plant physiology.

And last but not least: This task started with a scheme of a cross-section of maize. Questions about this scheme had to be answered with the help of the sections students had made themselves. However, most students treated this task as a pure theoretical one, without consulting their own sections.

The achievements of all the students on the various parts of the tasks are given in the appendix.

On the ground of these results six (6) golden, thirteen (13) silver, and nineteen (19) bronze medals were awarded.

Anna Bown from Australia, who at the final manifestation spoke on behalf of the students, was the model winner of this Olympiad.

This made this Olympiad to a great success for the Australian team (that in the Olympiad of last year was less successful) and also for the Chinese team which participated this year for the first time.

The distribution of the medals among the participating countries is shown below.

**Gold Silver Bronze**

China	1	3	-
Australia	1	2	1
Poland	1	2	1
Czech Republic	1	1	2
Netherlands	1	1	2
Bulgaria	1	-	-
Germany	-	2	1
Turkey	-	1	3
Belorussia	-	1	-
Sweden	-	-	4
Thailand	-	-	3
Ukraine	-	-	1
Russia	-	-	1

Optical scorable answer sheets were used in the Theoretical Test, part A.  
 This offers the opportunity to perform a statistical analysis.  
 The results are represented in the following tables I and II.

A survey of the answers of each individual student shows table I. It is remarkable that 18 students (= 30 % of the total population) did not fill out all questions. In table I this is indicated with '-'. For some students it is obvious that lack of time has caused this. Student nr 19 left out the very number of 13 questions.

Table I: Theory, part A, answers of each student

Participation number and name of each student, followed by a code for each question.

- . correct answer
- \* skipped question
- not answered
- A, B, C, or E incorrect answer

1	Bown	.C.....D.*	.....	C.....E.C	..BC.....C	.A.*...*	CA..A.A...
		**BCA..BA.	...BD*.*B.	D..C.C....	*.....	.....*	.
2	Boon	DC..BCCD.*	.....B...	C...D..BEC	..AAC..ADA	.A.*..D*..	.B..A.A..A
		**B.A.AB.D	...BB*.*..	DB.AAAC...	*.B.D..C.C	A.E.A.C*DA	.
3	Knatko	.....C.DA*	..A.C..D..	...B....C	.A..B...BA	.D*..B*..	.....BA.
		**..B.A...	.....*.*B	..A.....	*..B.B....	BCCA...*DD	.
4	Teneva	AC...C.DB*	..A.....	D.....C	C...CACDBB	.A.*...*	.....B...
		**B...AA.D	A...*.*..	A.-.D.-.-	*.D...A.B	BCCDA...*D-	.
5	Xing	DCB.....*	.....A..	.C.....C	..A.....C	.D*..B*..	.A..D...A.
		**.....A..	...B*.*..	.....C....	*.D..A...	.C....C*C.	.
6	Lhota	DC.....*	..ABC.....	.....C.	..D.C....B	.A.*...*	.....B..
		**BBB.BD..	...B*.*..	D...C.A..	*.....B	AC.....*D	.
7	Wurzinger	DC.....*	...CA.D.D	D.....ED	C.A..ADB.A	.DA*...*	.E..C.B..D
		**..A.BA.C	A...*.*A	DB.A.A....	*.D.....	.CD....*DB	.
8	Houben	.C.....*	..C..D...D	C.C.D....	B.A..CA..	...*..D*..	.BA..CA...
		**.....	...B*.*..	B..A.A....	*.AD.C.C..	A.D....*	.
9	Gomulka	DC.....*	..A...D..	...D..E..	..AC.D..BA	...*...*	....C.....
		**B.....	...B*.*..	..A.....	*.....B	....D.*C.	.
10	Slokasova	DC...C.EB*	..A.....	D...D...B	C...CAD.BB	.DD*..B*..	.A..C.D..D
		**BAC.B...	...B*.*..	AAA.....	*CAD.B.A..	DACA...*CB	.
11	Hric	DCB.....*	..ABC..DB.	D.....C.D	-.BCB-.-.B	-.*..D*..	-.-.-.A.
		**B..CBAAC	B...B*.*.D	AAACDD.-.	*.DD.B...B	BAEDA...*A.	.
12	Bartfay	.C.....*	..CA.....	C..C....B	.BACCC.A.C	.AD*..C*A.	.AA.C.A...
		**B.A..DAC	.....*.*..	DB.....	*...BDA..	...AA...*DB	.
13	Vejabhuti	BC.....A*	..A.....	C.....EB	.....	..D*..C*..	.A..D.D.C.
		**..B.....	...C*.*..	...D.....	*..B.....	BA..C...*DD	.
14	Koseoglu	DC...C.DB*	..A.C.D.B.	.....D	.AA...D.B	AA.*..C*..	....A.A.E.
		**BCBAAAB.	...B*.*..	A...D.A.	*.DBC.B....	BA.CC.D*DD	.

15	Savrasov	.C..B..DA* **BCB.BA.D	..A....D.. ..A.B*.*.-	D...D..... -B-.D..DB	.A....CD.B *.D.....	.A.*...*.. B.DA..-*AA	CAA.CCA... .
16	Handfield	DC.....* **B.....	..A..... ...A.*.*..	C.....C ...D.....	..DC.....C *.....C	...*...*.. B.DA..D*..	.BA.AC...D .
17	Smets	.C.-C...* **B..ABB..	..A..... A...D*B*.B	DC....C.C AB.A.D..B.	.AD.BCCABB *.ABCD.A..	.AA*..C*.- DCC.AD.*EB	....D.B.AA .
18	Truchatchova	DC...A.DA* **B.B.B..D	..D....D.. ...B*.*..	...CD..... BBA..A....	C...A.C.BB *.D.B....	..A*..C*.C BC.C...*C.	....A.B... .
19	Shouroulinkov	ACB.....E* **B.A.B...	..A....A. ...B*.*.D	-.....C -.....	-.ACCA-B.A *.D...C.B	.A.*.D.*.. ..C-..*--	.A....-..A -
20	Yue-Yi	A....C...* **B....B..	..... ...B*.*..	..... ..A.....	...C...C *.....	.D.*...*.. ..D...*CD	..... .
21	Kotorova	DC...C.D.* **B.ACAB.C	D.ABC..D.D ...B*.*..	D...D..... AAB..D....	B.A.A..B.B *.BA...A.C	.AA*..C*.. ACDAA.D*ED	.A..CDA... .
22	Niebisch	D.....* **C.....D	.....C A.BB.*.*..	D....C.BD DC.....-D	..ACC..B.C *.A.D....	.AA*...*.. A.CA..D*.D	CA..CC..D. .
23	Bakker	DCB.....B* **D.A.....	....A.DA. ..A.*E*E.	C..A...C.. ...A.A....	B..CC...A *.A...C..	..D*..C*.D .BDA...*ED	.ABD.D.... .
24	Nalepa	DC....D.* **..C.....	..A..... ...B*.*..	C..D...C. DB.....	..A.CA.... *.....C	...*..C*.. .C.....*CD	CA....B.D. .
25	Ramil	BA..B..DA* **..BA.AA.D	.AA.C..A.A ...B*.*..	...D.B..C ACA..AC...	.....DBBC *.D..A...	.DD*..C*.. A.AA.D*C.	..A..CDBAA .
26	Svetlansky	DCA.BC..B* **BCBCBAAD	.AAAC.BAA. ...B*.*BD	D...D.C..C AC..ADD...	..A.CC.A.C *.DD.B.A..	.A*..D*A. BCAA...*EA	.A.AD.B..A .
27	Ahlen	DC.....B* **B...AD.D	..C....D.. A...*.*..	..B....E.B DC.AEAD...	B.DBC.B..C *.A.B...B	..D*..C*.. A..A.DC*..	....CB.A. .
28	Nuntarukchaikul	DC.....A* **B...B..D	..C.C..... ...B*.*..	C..A...ED DC..AD...	.ABCA...B. *.B..AA..	.AA*..C*.. B.E.AD.*CB	.A..D.A.C. .
29	Sonat	.C.....B* **B..AAA..	..A.C..... ...C*.*.D	D...D..... -A.....D.	..AC.A..BB *B.D.C....	..D*..C*.. BCED..B*CB	....CCD..D .
30	Kovtun	B...C.D.* **C-B.B...	.CA.C...AA ...D*.*..	.....E.C ACA..A.-.	....ACBCC *.D..C.A..	..D*..C*.. .BC.A.D*ED	....ACA.CD .
31	Henry	DC...C.A.* **B.C.....	.....D.. ...B*.*..	.....BEC ...A....	C.DC.....C *C.D.....	.B.*...*.. A..D...*D	....C.... .
32	De Keulenaar	DC.E...DB* **B.C..BB..	..CBC..D.. ...BD*.*..	...DE.B.D D.A.ADC.D.	C...C.DB.A *.B.C...D	.DA*..D*.C DBD..D.*EB	.A..CBBA.C .
33	Kuzmina	.C....D.* **B....A..	..A..... ...B*.*..	.....C D.A...D.DB	..BCA.DA.A *...B....	.A*..C*.. BCD...*AD	...-C.B... .
34	Karaulanov	DC.....B* **B.A..A..	..... ...B*.*..	.....C ...A....	...A.CABB *.....	.A*..C*.. BCD...*D-	....C.B... -
35	Lu	DC.....* **B....B..	..... ...B*.*..	.D....C.. .....	...CD...B *.D.....C	.D.*...*.. A.DDC.D*.D	.A..C.A..A .
36	Hulva	BCD..C..A* **..A..ABC	..A.C...C B...B*.*..	...D..... D....E...	B..CADC..C *.DD...E.C	.A*...*.. ...A.*CD	...CC.D..D E
37	Scheler	DC...A.AB* **CAA..B.C	..A...DB.. D.A.*.*AD	D...E.BC. AB.A.ACAD-	..AC.CD.A *.AD...A.	.DA*..C*.. AC.D.D.*DA	A...CCB.D. .
38	Raats	DC.....* **B.A.BB.B	..A....D.. B...*.*.D	D..AD..BC. B..D.....	B.ACAC...C *C.D...CA.	.AD*..C*.. .A.....*DD	..ADADD... .
39	Kaminski	.C.....* **BA.C....	..A..... ..A.B*.*..	..... .....	...A.... *.DD..A..	...*..A*.. A....D*C.	....B..D .
40	Kaganski	AC....DB* **BCACBD..	.....D.. D.A.B*.*..	D..... DB...DC...	...C.C.BC *.DD.C...	.A*..B*.A BCCA...*CD	..BDC.D..C .
41	Jankacka	DC.....* **B.AA.BAD	.AD.C.... ...B*.*C.	DB..AB..B BB..DC.B..	C.ABC..B.C *.AB.B...C	.DA*CAD*.. BCCDD.D*C.	.A.ADBBBBCD .
42	Edvarsson	DC.....B* **..AC.BB..	..ABCADD.A A.CB.*.*..	..BAD..AE. .C.ADCC...	..ACC..B.A *...D.A..	.DA*...*.. BCE...*D.	....CDA... .
43	Utanwutipong	.C.....* **BCAA....	..A....D.. B...B*.*..	...E....C .A...C....	...D..B. *.....E..	...*...*.. BCCCA.D*..	.E..D.A.C. .
44	Erdonmez	DC.....* **.....B.D	..A....D.. ...C*.*..	..... ..A...E...	B.B.C.... *.B.....	.A*..DC*.. A...A.D*..	....A.A... .

45	Rosul	DC.....DB* **CAA.C...	D.D.A.AA.. A.ABB*.*..	C.E.A..B.D ACACDC..D	BCD..DDBBC *.BDCCAA..	.DD*D.B*.. BB.C..C*CB	.BBC.C..C. .
46	Shaw	.C.....* **BCA..A..	.CA...DD.. .....*.*..	D.B...B.C DAAA.DD...	...C.....B *.BD...C.C	.DC*..C*.. AB.CA..*D.	..D.D.DB.. .
47	Mansouri	DC..BC.D.* **B..D.BAC	-.AB.A.D.A BA..D*.*..	A...D.C.EC AB..AD....	.A...ACB.. *.A.ABC...	..A*.C*.. DCCC..D*EA	AEADA.B.C. .
48	Petrikovich	.C...C.D.* **B.A.B...	..A.C..D.C A..D.*.*..	C...B...C DCA..AD...	..ABC.DBBC *.DB.....	..D*..B*.A DAC.AD.*A.	C...C.D... .
49	Jordanov	ACB..C.DB* **..A..A..	..A.D..... .....*.*.D	D...D...C BBA.DCCB..	CB..C.C... *.D.....C	.DD*.AC*.. DC.C.D.*C.	.A..A.B... .
50	Xiao-Guiang	.....* **BCC..B..	..... -..B*.*..	.....E.C .....-D..	...-C...B *.....A..	.D*..... BCEC..D*CB	.A..D..... .
51	Kratzerova	A.....B* **BB...D..	..ABC..D.. -..DB*.*..	C...E...C DBA..AE...	...AD..CC *.B.....	.A*.DC*.. AC--...*D-	.B...D... .
52	Kittler	DC...C..B* **B...BA..	..A...AB.. A.B..*.*..	...A...CB B.A..AE...	C...C..A.B *.D...E..	.DA*..C*.. ACEC..D*AB	CA..A..... .
53	Nijdam	BCDE.C...* **B...B..	..CB...D.. A..D.*.*..	..CCA..B.. ..AA.C..D.	B...C.... *BC.DC.C..	.AA*..... .EA.C..*C.	D..D....AD .
54	Tomalski	.C.....* **BAB...AB	..A.CD.... ...B*.*..	.....C B.....	..A.C...A *.D.....D	...*..... .CEC.DD*CB	.....DB... .
55	Kvasjnina	DC...C.D.* **BCC.CA.D	..A...D.. .....*.*..	C...E..... DBA..A....	...A-DD..C *.B-.B....	.DD*..D*AC A..A-...*ED	.EA.ADABAD .
56	Kilarska	DC-..CADB* **B..C.A.B	.EC.A..D.. A....*.*.B	D..AAE...B DB...AE.A.	B.ACC.BB.B *.B.DD....	..D*.AB*.. DBECD...*C.	CBDDD.DBD. .
57	Jonemo	.C.....* **BCA.A.A.	...BC..D.. D..BC*.*..	..BA...ED B.AA.AC...	..DA.C.ABC *.D.D..A..	..D*..... A.AA...*..	.AA.D..... .
58	Chumsri	DC.....* **B.BAB..D	...B..... ..A.B*.*..	.....E. .B..DAC...	...C..C.BC *E.....A.B	.AA*..C*.. .A...D*C.	.A...B.CA .
59	Sekercioglu	DC.....B* **B.A...B.	..A..... ...B*.*..	D..... ..A...A.	..ACC...BA *.DA..A...	...*..... AADA...*D	....A..... .
60	Shtonda	.C.....D.* **CAA.B...	..... .....*.*..	C..... .AA..A....	...C.D... *.A...E..	.DA*C.C*.. BCAAABD*C-	.A..D..... -

Table II represents a complete item analysis.

In this analysis all items (questions) were equally balanced. In fact this is not quite correct, because the obtainable scores varied:

83 questions 1 point

16 questions 2 points

3 questions 3 points

9 questions were skipped (10-44-48-61-62-76-78-91-108).

Of each item the following data are indicated.

- **P = fraction of the students with a correct answer.**

Very difficult questions ( $P < 0.30$ ) were: 1-2-13-40-42-55-57-63-101-109.

The most difficult question was 2. Only 10 % of the students gave a correct answer.

Very easy ( $P > 0.95$ ) were: 4-7-41-72-77-99.

The most simple question was nr 41 with 98 % correct answers.

The mean values of P for each domain are:

Cell Biology  $P = 0,73$  26 questions

Plant Physiology  $P = 0,56$  13 questions

Animal Physiology  $P = 0,74$  8 questions

Animal Anatomy  $P = 0,60$  8 questions

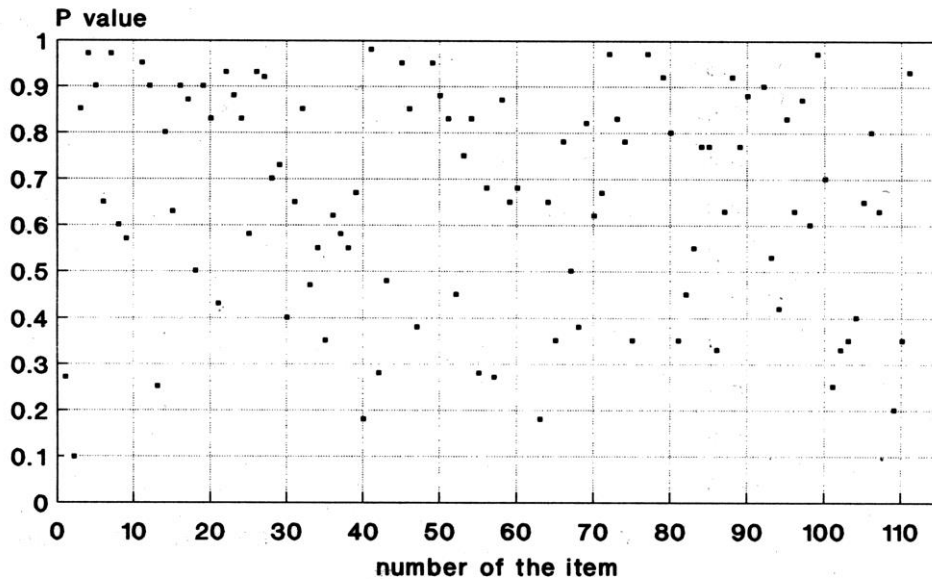
Ethology  $P = 0,52$  8 questions

Genetics  $P = 0,71$  20 questions

Ecology  $P = 0,60$  19 questions

Overall, part A  $P = 0,67$  102 questions

Besides table II also the following graph show the value of P for each individual question.



- RIR Item Test Correlation

This is a kind of Discrimination Index for each item between 'bright' and 'poor' students. RIR varies between -1 and +1.

The higher RIR the better the question, which means that students with a correct score on the considered item in the average have a high score on the whole test.

RIR = 0 means: bright and poor students perform equally.

RIR < 0 means: a tricky question, poor students answer this question better than bright students.

The average value of RIR for the whole theoretical test part A was 0,22, which is not bad.

Excellent discriminating questions (RIR > 0,40) were:

15-38-43-54-67-81-82-86-93-96.

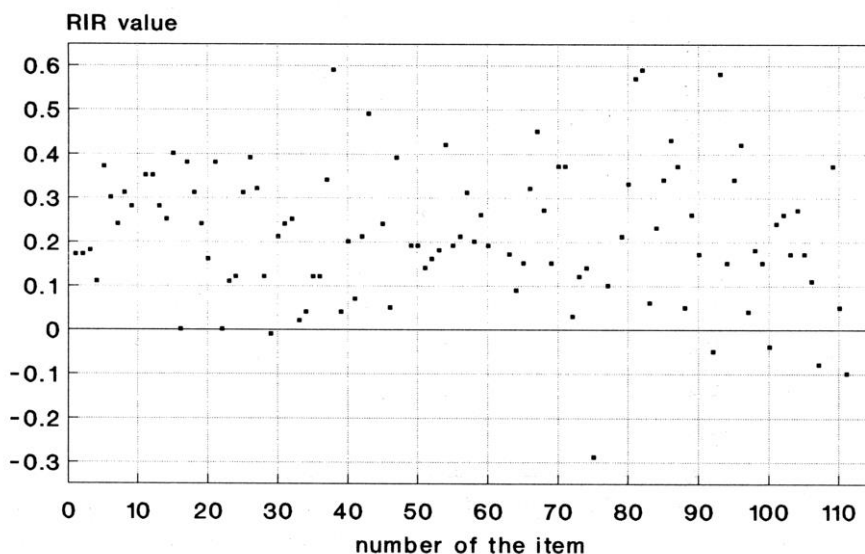
The best were 38 and 82 (both RIR = 0,59)

Poor discriminating questions (RIR < 0,05) were:

16-22-29-33-34-39-72-75-92-97-100-107-111

Question nr 75 with RIR = - 0,29 was really very tricky.

Besides table II also the following graph show the value of RIR for each individual question.



## F (frequency)

- This number indicates how many students have chosen each alternative A, B, C, D or E.  
 - Z Index indicating the quality of the alternatives of an item.

Normally Z varies between -2 and +2.

Alternatives chosen by poor students have  $Z < 0$

Alternatives chosen by bright students have  $Z > 0$

$Z = 0$  means that the same amount of bright and poor students have chosen the alternative.

The quality of the alternatives of an item can be compared in observing the Z-values. Better quality means: Z-value higher positive for the correct alternative and Z-value more negative for the incorrect alternatives.

Excellent discriminating and balanced items are:

2-13-38-43-47-57-81-86-109.

All these questions have  $Z > 0.49$  for the correct alternative.

Poor discriminating and balanced questions are 16-22-75-92-100-107-111.

In considering all Z-values it is possible to trace the catch alternatives in which especially the bright students blundered in choosing an incorrect alternative. These alternatives are:

74 A (Z = 1,42)

42 B (Z = 1,19)

75 C (Z = 0,62)

22 D (Z = 1,24)

16 D (Z = 0,95)

46 D (Z = 0,53)

88 D (Z = 1,14)

28 E (Z = 0,68)

Tabel II Item analysis

ITEMNR	P	A				B				C				D		E
		RIR	F	Z	F	Z	F	Z	F	Z	F	Z				
1	.27	.17	6	.19	5	-.03	16	.28 *	33	-.16	0	.				
2	.10	.17	1	-.79	0	.	53	-.04	6	.50 *	0	.				
3	.85	.18	1	-1.85	5	-.05	51	.07 *	2	-.02	0	.				
4	.97	.11	0	.	0	.	0	.	58	.02 *	2	-.62				
5	.90	.37	54	.12 *	5	-1.10	0	.	0	.	0	.				
6	.65	.30	2	-.61	0	.	19	-.39	39	.22 *	0	.				
7	.97	.24	1	-1.64	58	.05 *	1	-.99	0	.	0	.				
8	.60	.31	2	-.10	36	.25 *	0	.	21	-.40	1	-.47				
9	.57	.28	7	.12	18	-.49	34	.24 *	0	.	1	-.29				
10	.	.	.	.	.	.	.	.	.	.	.	.				
11	.95	.35	0	.	57	.08 *	0	.	2	-1.56	0	.				
12	.90	.35	3	-1.38	0	.	2	-.25	54	.12 *	1	-1.66				
13	.25	.28	35	-.03	15	.49 *	7	-.36	3	-1.22	0	.				
14	.80	.25	2	-.87	10	-.42	48	.12 *	0	.	0	.				
15	.63	.40	2	-1.94	38	.31 *	19	-.40	1	-.28	0	.				
16	.90	.00	4	-.48	0	.	0	.	2	.95	54	.00 *				
17	.87	.38	2	-1.15	2	-1.43	52	.15 *	4	-.66	0	.				
18	.50	.31	4	-.86	2	-.81	30	.31 *	24	-.18	0	.				
19	.90	.24	4	-.60	2	-.91	0	.	54	.08 *	0	.				
20	.83	.16	4	-.82	50	.07 *	3	-.10	3	-.01	0	.				
21	.43	.38	1	-1.53	26	.43 *	14	.13	18	-.63	0	.				
22	.93	.00	0	.	1	-1.55	2	.12	1	1.24	56	.00 *				
23	.88	.11	0	.	4	-.21	2	.44	53	.04 *	1	-2.12				
24	.83	.12	7	-.41	50	.05 *	3	.08	0	.	0	.				
25	.58	.31	3	-1.32	2	.09	35	.26 *	17	-.33	3	.06				
26	.93	.39	1	-1.56	0	.	0	.	56	.10 *	3	-1.41				
27	.92	.32	55	.10 *	2	-1.14	3	-1.03	0	.	0	.				

28	.70	.12	1	-.65	8	-.62	4	-.30	42	.08 *	5	.68
29	.73	-.01	0	.	1	.20	6	.09	44	-.01 *	9	-.05
30	.40	.21	24	.25 *	7	-.40	21	.10	8	-.69	0	.
31	.65	.24	0	.	10	-.29	9	-.26	39	.17 *	0	.
32	.85	.25	6	-.51	2	-.07	1	-2.13	51	.10 *	0	.
33	.47	.02	20	-.12	5	.32	28	.02 *	7	.01	0	.
34	.55	.04	4	-.82	3	-.75	19	.17	33	.04 *	0	.
35	.35	.12	8	.03	3	-.62	27	-.04	21	.17 *	0	.
36	.62	.12	9	.03	37	.10 *	6	-.58	7	.13	0	.
37	.58	.34	35	.29 *	2	-.90	13	-.24	9	-.53	0	.
38	.55	.59	9	-.19	13	-.92	33	.53 *	4	-.63	0	.
39	.67	.04	40	.03 *	17	.02	2	-.23	1	-1.02	0	.
40	.18	.20	12	.01	16	-.18	21	-.09	11	.42 *	0	.
41	.98	.07	1	-.52	0	.	59	.01 *	0	.	0	.
42	.28	.21	22	-.09	1	1.19	17	.33 *	18	-.16	0	.
43	.48	.49	15	-.54	29	.50 *	1	-.11	15	-.42	0	.
44	.	.	.	.	.	.	.	.	.	.	.	.
45	.95	.24	0	.	57	.05 *	2	-.48	1	-2.11	0	.
46	.85	.05	4	-.42	51	.02 *	1	-1.47	4	.53	0	.
47	.38	.39	23	.49 *	7	-.47	24	.00	6	-1.33	0	.
48	.	.	.	.	.	.	.	.	.	.	.	.
49	.95	.19	3	-.81	57	.04 *	0	.	0	.	0	.
50	.88	.19	2	-.44	53	.07 *	3	-.57	1	.12	0	.
51	.83	.14	2	-1.43	50	.06 *	7	-.03	1	-.07	0	.
52	.45	.16	22	.03	6	-.44	27	.17 *	0	.	4	-.34
53	.75	.18	9	-.14	3	-.80	45	.11 *	2	-.88	0	.
54	.83	.42	2	-1.72	50	.19 *	2	-1.06	6	-.62	0	.
55	.28	.19	13	-.02	17	.30 *	17	-.10	12	-.15	0	.
56	.68	.21	41	.15 *	2	-1.40	11	-.14	6	-.28	0	.
57	.27	.31	14	.01	17	-.20	16	.52 *	11	-.30	0	.
58	.87	.20	1	-1.19	7	-.40	52	.08 *	0	.	0	.
59	.65	.26	8	-.26	39	.19 *	8	-.41	4	-.42	1	-.56
60	.68	.19	7	-.50	41	.13 *	2	-.79	10	-.01	0	.
61	.	.	.	.	.	.	.	.	.	.	.	.
62	.	.	.	.	.	.	.	.	.	.	.	.
63	.18	.17	11	.35 *	43	-.01	5	-.69	1	.05	0	.
64	.65	.09	7	-.20	3	.13	10	-.10	39	.06 *	0	.
65	.35	.15	22	-.25	10	.11	7	.04	21	.20 *	0	.
66	.78	.32	6	-.33	47	.17 *	6	-.74	1	-1.49	0	.
67	.50	.45	9	-.33	19	-.40	2	-1.48	30	.45 *	0	.
68	.38	.27	17	-.30	15	-.22	23	.34 *	5	.13	0	.
69	.82	.15	8	-.51	3	.17	49	.07 *	0	.	0	.
70	.62	.37	37	.29 *	3	-.35	7	-.74	13	-.36	0	.
71	.67	.37	11	-.59	5	-.43	40	.26 *	3	-.62	0	.
72	.97	.03	1	-1.45	58	.01 *	0	.	0	.	0	.
73	.83	.12	7	-.29	2	.02	1	-.63	50	.05 *	0	.
74	.78	.14	1	1.42	8	-.49	47	.08 *	4	-.26	0	.
75	.35	-.21	21	-.29 *	31	.21	4	.62	4	-.71	0	.
76	.	.	.	.	.	.	.	.	.	.	.	.
77	.97	.10	0	.	1	-1.18	0	.	58	.02 *	1	.13
78	.	.	.	.	.	.	.	.	.	.	.	.
79	.92	.21	1	-1.37	2	-.35	1	-1.56	55	.06 *	1	.12
80	.80	.33	1	.02	3	-.70	48	.16 *	7	-.76	0	.
81	.35	.57	12	-1.11	8	-.07	21	.78 *	18	-.12	0	.
82	.45	.59	6	-.25	16	-.55	9	-.76	0	.	27	.65 *
83	.55	.06	23	.00	1	-1.03	33	.06 *	0	.	0	.
84	.77	.23	11	-.32	0	.	3	-.77	46	.13 *	0	.
85	.77	.34	4	-1.40	46	.19 *	1	-2.15	8	-.12	1	-.08
86	.33	.43	20	-.16	20	.60 *	8	.22	11	-1.06	0	.
87	.63	.37	0	.	38	.28 *	10	-.76	7	-.39	5	-.09



88	.92	.05	2	-.11	2	-.90	55	.02 *	1	1.14	0	.
89	.77	.26	3	-.39	1	-1.21	46	.14 *	6	-.41	0	.
90	.88	.17	0	.	2	.12	53	.06 *	2	-.95	0	.
91	.	.	.	.	.	.	.	.	.	.	.	.
92	.90	-.05	54	-.02 *	2	-.02	3	.18	0	.	1	.40
93	.53	.58	7	-.76	7	-1.17	1	-.10	13	-.29	32	.54 *
94	.42	.15	5	.11	9	-.09	25	.17 *	20	-.16	0	.
95	.83	.34	1	-1.48	50	.15 *	4	-1.27	5	-.21	0	.
96	.63	.42	38	.32 *	12	-.54	6	-.36	4	-.85	0	.
97	.87	.04	6	.10	52	.01 *	1	-1.46	1	.12	0	.
98	.60	.18	13	-.46	0	.	7	-.11	36	.15 *	4	.33
99	.97	.15	2	-.80	0	.	58	.03 *	0	.	0	.
100	.70	-.04	42	-.03 *	7	.22	9	-.01	2	-.13	0	.
101	.25	.24	18	.16	20	-.09	15	.41 *	7	-1.03	0	.
102	.33	.26	8	-.09	6	-.95	25	-.03	20	.36 *	1	-.12
103	.35	.17	5	-.47	21	.23 *	12	-.41	12	.47	9	-.36
104	.40	.27	16	-.13	24	.33 *	11	-.32	7	-.29	0	.
105	.65	.17	14	-.20	39	.13 *	4	.47	2	-1.64	0	.
106	.80	.11	0	.	1	.58	0	.	10	-.29	48	.05 *
107	.63	-.08	38	-.06 *	1	.00	4	-.46	16	.29	0	.
108	.	.	.	.	.	.	.	.	.	.	.	.
109	.20	.37	5	-.42	12	.74 *	21	.15	13	-.10	8	-1.04
110	.35	.05	5	-1.27	11	-.32	21	.07 *	18	.39	0	.
111	.93	-.10	0	.	0	.	56	-.03 *	0	.	1	.03



*Anna Bown top Gold medal winner of Australia, a touching moment*

Ranking 4th IBO			Practical Part					Theoretical Part			Overall				
			I	II	III	IV	V	Total B	A	Total	Pr+201*Th/187				
			Maximum	40	41	45	39	36	201	63	124	187	402		
			Mean	20	17	11	25	23	97	36	79	115	221		
1	Anna	Bown	Australia	24	29	21	33	32	139	43	98	141	290	<b>Gold</b>	
2	Stanislav	Lhota	Czech	29	13	27	34	27	130	47	93	140	280		
3	Liu	Yue-Yi	China	21	18	28	26	21	114	45	107	152	277		
4	Karol	Kaminski	Poland	25	19	10	31	26	111	51	103	154	276		
5	Emil	Karaulanov	Bulgaria	21	26	9	39	27	122	52	92	144	276		
6	Stephan	Houben	Netherlands	36	22	6	33	27	124	46	94	140	274		
7	Xu	Xing	China	21	24	17	25	25	112	47	97	144	267	<b>Silver</b>	
8	Toby	Handfield	Australia	16	36	19	26	22	119	39	96	135	264		
9	Amanda	Henry	Australia	17	26	12	30	27	112	46	94	140	262		
10	Elena	Knatno	Belorussia	17	16	28	31	31	123	41	88	129	262		
11	Sander	Nijdam	Netherlands	31	37	12	29	28	137	40	76	116	262		
12	Cagan Hakki	Sekercioglu	Turkey	22	27	14	21	28	112	47	91	138	260		
13	Lenka	Kratzerova	Czech	31	27	19	24	28	129	43	78	121	259		
14	Ou Gang	Xiao-Guang	China	19	14	18	27	25	103	52	92	144	258		
15	Gao	Lu	China	19	26	13	26	23	107	45	94	139	256		
16	Katja	Wurzinger	Germany	19	28	18	37	30	132	36	77	113	253		
17	Axel	Niebisch	Germany	20	21	11	33	33	118	44	81	125	252		
18	Grzegorz	Nalepa	Poland	11	19	20	31	22	103	46	93	139	252		
19	Szymon	Gomulka	Poland	25	20	4	24	22	95	47	99	146	251		
20	Pavel	Hulva	Czech	27	13	22	27	27	116	43	76	119	243		<b>Bronze</b>
21	Johan	Ahlen	Sweden	35	28	7	29	26	125	34	76	110	243		
22	Can Kerem	Erdonmez	Turkey	30	14	9	21	24	98	39	95	134	241		
23	Chris	Bakker	Netherlands	22	24	11	31	27	115	38	80	118	241		
24	Saranya	Chumsri	Thailand	28	16	12	21	21	98	45	84	129	236		
25	Radoslaw	Tomalski	Poland	21	11	5	23	25	85	51	88	139	234		
26	Johan	Jonemo	Sweden	20	23	4	35	23	105	34	81	115	229		
27	Choladda	Vejabhuti	Thailand	19	4	8	31	22	84	40	94	134	228		
28	Edith	Raats	Netherlands	21	13	11	28	31	104	35	76	111	223		
29	Warit	Utanwutipong	Thailand	35	1	17	13	16	82	39	90	129	221		
30	Amanda	Shaw	Australia	21	21	2	31	29	104	32	75	107	219		
31	Inci Asli	Sonat	Turkey	21	18	16	21	21	97	36	78	114	219		
32	Ralf	Kittler	Germany	32	12	9	21	29	103	32	73	105	216		
33	Ivana	Kotorova	Czech	22	14	28	18	21	103	41	63	104	215		
34	Sven-Erik	Barfay	Sweden	19	14	7	28	22	90	37	79	116	214		
35	Boris	Shtonda	Ukraine	6	13	24	30	24	97	23	85	108	213		
36	Rachmatullin	Ramil	Russia	23	22	11	27	22	104	31	68	99	212		
37	Hikmet	Koseoglu	Turkey	16	17	17	27	18	95	40	69	109	212		
38	Magnus	Edvardsson	Sweden	30	18	4	20	26	98	33	71	104	210		
39	Maneeratana	Nuntarakchaikul	Thailand	17	22	6	18	21	84	40	74	114	207	<b>Honourable mention</b>	
40	Nico	Boon	Belgium	18	23	12	25	28	106	29	64	93	205		
41	Tanja	Scheler	Germany	24	19	14	30	22	109	32	57	89	205		
42	Ivor	Svetlansky	Slovakia	29	11	7	33	27	107	33	54	87	201		
43	Dimitro	Kovtun	Ukraine	22	20	9	17	25	93	29	72	101	201		
44	Elena	Truchatchova	Belorussia	22	15	1	28	12	78	33	80	113	199		
45	Dejan	Jordanov	Bulgaria	12	22	7	22	30	93	26	72	98	198		
46	Nataliaq	Slokasova	Russia	20	17	5	18	26	86	29	72	101	194		
47	Andrea	Jankacka	Slovakia	20	16	14	27	23	100	28	56	84	190		
48	Lucia	Kilarska	Slovakia	35	15	9	17	28	104	25	54	79	188		
49	Eva	Smets	Belgium	16	7	5	29	24	81	32	64	96	184		

50	Miroslav	Hric	Slovakia	23	13	7	28	22	93	26	58	84	183
51	Michail	Kaganski	Russia	3	26	11	18	5	63	28	74	102	173
52	Yevgen	Savrasov	Ukraine	17	13	2	27	17	76	15	71	86	168
53	Elena	Kutzmina	Belorussia	6	14	7	12	21	60	13	85	98	165
54	Petar	Shouroulinkov	Bulgaria	13	13	0	17	21	64	16	70	86	156
55	Xavier	de Keulenaar	Belgium	8	10	4	23	24	81	29	61	90	155
56	Miroslav	Rosul	Ukraine	15	12	6	11	26	70	23	52	75	151
57	Dmitri	Petrikovich	Belorussia	13	6	1	0	18	38	30	72	102	148
58	Madjid	Mansouri	Belgium	4	11	0	20	18	53	23	60	83	142
59	Tania	Teneva	Bulgaria	5	6	0	13	19	43	17	75	92	141
60	Elena	Kvasjnina	Russia	6	7	0	6	14	33	30	69	99	139