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Departamento de
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ARGENTINA 2006

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de julio



17th INTERNATIONAL BIOLOGY OLYMPIAD
RIO CUARTO- ARGENTINA, JULY 9th -16th, 2006

REPORT



17th INTERNATIONAL BIOLOGY OLYMPIAD

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SUMMARY

The organization of the 17th IBO started in 2003, soon after the Ministry of Education, Science and Technology (MEST) accepted the Project. The academic, social and cultural aspects were organized by special committees conformed by teachers and grant holders from the Rio Cuarto National University (UNRC). Many volunteers also contributed with the organization. All the activities were coordinated by the 17th IBO Executive Organizing Committee through its Secretariat. A number of 290 people participated in this organization.

The 17th IBO was financed by the MEST and the UNRC according to the terms of a signed agreement and was sponsored by national, provincial and local entities as well as by private organizations.

The international jury consisted of 137 teachers while 185 students participated in the competition.

The program was carried out as planned, obtaining very satisfactory results from the academic point of view. The statistical data showed that the exams, particularly the practical ones, were very useful instruments to evaluate students' skills in problem solving and to determine the ranking for the prizes to the best scores

The 17th IBO Organizing Committee was highly praised on account of the organization of this event, not only by the participants but also by national institutions.



INTRODUCTION

The International Biology Olympiad (IBO) is a competition for secondary school students from different countries in which their skills in tackling and solving biological problems are tested.

The IBO was founded in 1989, prompted by UNESCO. The first competition was held in Olomouc, Czechoslovakia in July 1990 with the participation of six countries (Belgium, Bulgaria, Czechoslovakia, German Democratic Republic, Poland and the Soviet Union). The Olympiad has been a continuous success and the number of participating countries increased rapidly, being more than 50 to date.

The **aims** of the IBO are:

- *To stimulate students' interest in biology for creative problem solving.
- *To promote exchange of ideas and materials about Biology teaching as well as the relations among Biology students from different countries.
- *To foster friendship among young people from different countries towards understanding and cooperation among nations.

Moreover, the IBO **is an outstanding opportunity to** compare the educational trends and Biology lexis in different countries.

Argentina participated as observer for the first time in 1995 in Thailand and since 1996 has been present every year with the corresponding team of four students. In 2001, Argentina, with the approval of the Ministry of Education, Science and Technology, applied for hosting the Olympiad.

The organization of the 17^o IBO began in 2003, after the project was accepted by the Ministry of Education, Science and Technology. The academic, social and cultural aspects were organized by different committees constituted by teachers and grant holders from the Rio Cuarto National University, and a good number of volunteers. All the activities were coordinated by the 17^o IBO Executive Organizing Committee through its secretariat. A number of 290 people were involved in the organization of this event.

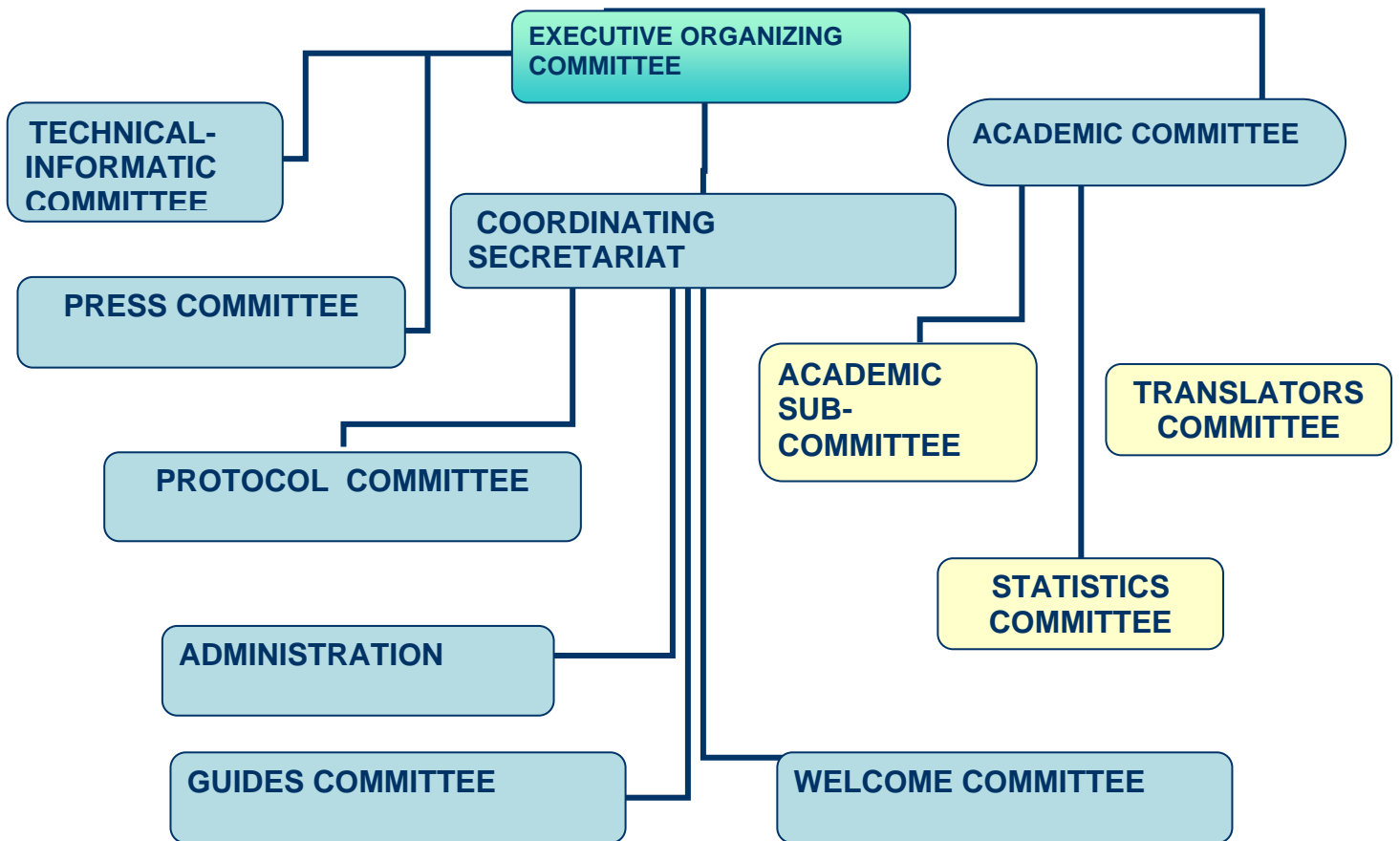
The aim of this report is to summarize the information regarding the general organization and implementation of the 17^o IBO, held from July 9th to 16th, 2006.



THE IBO COMMITTEES

The following flow chart shows the design and distribution of the different tasks as planned by the Executive Organizing Committee for the organization and implementation of the IBO. Each committee was coordinated by a teacher from the UNRC.

17° IBO – 2006 - ARGENTINA



Role of the committees:

Committee	Role
EXECUTIVE ORGANIZING COMMITTEE	To organize, coordinate, and carry out all the activities concerning the IBO.
COORDINATING SECRETARIAT	To carry out and coordinate IBO activities working along with the Executive Organizing Committee.
ACADEMIC COMMITTEE FOR THEORETICAL AND PRACTICAL TESTS	To prepare and coordinate the development of theoretical and practical tests.
ACADEMIC SUBCOMMITTEE	To select and assign collaborators for the academic committee. To arrange classrooms and labs. To supply the materials needed for the tests.
STATISTICS CONSULTANT	Statistics analyses of the tests results.
INFORMATICS TECHNICIAN	Permanent technical assistance during the IBO. Organization, distribution and maintenance of computers and equipments.
PRESS COMMITTEE	To record all information about the IBO (in print and images) for its broadcasting in different mass media.
PROTOCOL COMMITTEE	To organize the Opening and Closing Ceremonies in coordination with the 17 ^o IBO EOC.
ADMINISTRATIVE COMMITTEE	To coordinate the administrative activities of the Secretariat.
WELCOME COMMITTEE COMISIÓN DE BIENVENIDA	To welcome and check in IBO participants
GUIDES COMMITTEE	To escort the students during the entire week.
TRANSLATORS COMMITTEE	To translate the exams and informative bulletins. To handle the overhead projectors during the discussion and translation of the tests.

Positive aspects

- ❖ Specific roles for each committee.
- ❖ To appoint a coordinator for each committee.

Committees:

A detailed account of their constitution follows:

Committee	Coordinator/s	Members/ collaborators	Total
EXECUTIVE ORGANIZING COMMITTEE	3		3
COORDINATING SECRETARIAT	1	12	13
ACADEMIC COMMITTEE FOR THEORETICAL AND PRACTICAL TESTS	1	Members: 8 Facilitator: 1	14
ACADEMIC SUB-COMMITTEE	2	101	103
STATISTICS COMMITTEE	2	4	6
TECHNICAL INFORMATIC COMMITTEE	1	4	5
PRESS COMMITTEE	1	8	9
PROTOCOL COMMITTEE	1	8	9
ADMINISTRATIVE COMMITTEE	1	7	8
GUIDES COMMITTEE	2	53	55
WELCOME AND TECHNICAL SUPPORT COMMITTEE	2	13	15
TRANSLATORS COMMITTEE	2	2	4
OTHER COLLABORATORS		'Tango' workshop: 16 Art workshop: 12 Graphic arts: 2 UNRC service staff: 20	50
TOTAL			290



SELECTION AND PREPARATION PROCESS FOR THE IBO SUPPORTING TEAM AND GUIDES FOR TEACHERS AND STUDENTS

The IBO rules state that the host country must assign a team guide for each delegation. The 17^o IBO Executive Organizing Committee (IBO-EOC) devoted 5 months (March-July) to the selection of guides according to the following method:

- * A national call for applications through the web page of the Argentine Biology Olympiad.

- * Registration, background evaluation, and personal interviews to each applicant, taking into account: personality; commitment and enthusiasm; responsibility profile, and skills in handling young people.

- * Assignment of a guide for each country according to the language spoken by the guide (team's native language and/or English) and according to the culture of the assigned country.

- * The guides were requested to search for information about the social and cultural characteristics of the assigned country in order to create a comfortable environment for the participants.

- * Preparation of an instruction booklet with information about the organization, characteristics and role of the guides in each of the activities scheduled for the IBO.

- * Selection of substitute guides in case an appointed guide should suffer from any inconvenience during the Olympiad week.

- * Appointment of 2 coordinators to supervise the guides' work and to act as a link between the guides and the Executive Organizing Committee.

- * Intensive training of the collaborators from July the 6th to the 8th, at the Rio Cuarto National University. The training included the discussion of the instruction booklet, and city and campus tours according to the activities scheduled for the IBO.

- * Identification of the collaborators by means of ochre sweatshirts and badges with light blue strings.

Positive aspects:

- ❖ Nationwide call for volunteers.
- ❖ Appointment of substitute guides and guides' coordinators
- ❖ Intensive training at the Rio Cuarto National University during the days preceding the IBO.

ADMINISTRATIVE WORK FOR THE 17^o IBO

*In 2003, a logo contest was coordinated to select the identifying logo for this edition of the IBO.

*In 2004, a video with images of the country, Rio Cuarto City, and the Rio Cuarto National University in particular, was shown during the 15^o IBO, in Australia.

*In 2005:-the advances of the Project were presented during the 16^o IBO in China and the 17^o IBO webpage was made available.

- The topics for the four practical tests were submitted:

- * Vegetal Anatomy, Morphology, Systematics and Taxonomy.
- * Animal Anatomy, Systematics and Ecology.
- * Microbiology.
- * Biochemistry.

- Contacts were made with different local and provincial organizations in order to coordinate socio-cultural activities and to look for sponsors to finance some stages of the project.

- The IBO e-mail was made available (ibo2006@exa.unrc.edu.ar) to allow the communication with the coordinators of the participant countries in order to answer doubts or questions regarding the general organization of the 17^o IBO as well as the required documentation and the academic characteristics of this event.

The languages used for the communications were the IBO official languages: English and Russian.

This electronic means was used to send informative circulars and informative newsletters called "Mulita News" containing information about the IBO organization and its organizers as well as the social and cultural aspects of our country, city and province.

- Official invitations to participate in this competition were sent by the Ministry of Education, Science, and Technology.

* In 2006:

- The registration forms were received and this information allowed the committee: to prepare the material for each participant with the corresponding identification badge; to make the list of participants; to prepare the certificates of participation; to arrange hotel accommodation in Cordoba, Embalse de Rio Tercero, and Rio Cuarto; to complete the extended activities program which included the list of participants with the corresponding transportation during the week, sites for the examinations, testing procedure, etc; to organize the week meals taking particular dietary requirements (medical and cultural) into consideration; to select the sizes of T-shirts and dust coats; to send data of delegations to the embassies by means of official letters.

-Intensive work was done with different areas of the University and with city and provincial entities to organize every aspect of the event, particularly the social and cultural activities.

Difficulty

- ❖ Communication with some countries.

Positive aspects

- ❖ Immediate reply to participants' questions (from both teachers and students).
- ❖ Dissemination of virtual "Mulita News."



ACADEMIC ACTIVITY FOR THE 17^o IBO

The Academic Committee, constituted by nine teachers from the University, prepared the practical and theoretical tests. The Committee started its activities in 2005, according to the following procedure:

* Each teacher prepared questions (in both languages, Spanish and English) for the exam in line with the contents established by the IBO for part A and part B, according to his/her academic specialization.

* The questions were submitted to the analysis of the whole Committee in periodic meetings before being included in the exam.

* Between 5 and 10 questions were proposed by several participating countries, among them: Germany, Belgium, Belarus, Bulgaria, Canada, China, Korea, Denmark, Spain, United States, Finland, Japan, India, Indonesia, Iran, The Netherlands, Lithuania, Mexico, New Zealand, Poland, Czech Republic, Swedish,

Switzerland, United Kingdom, Romania, Russia, Turkey, Turkmenistan, Chinese Taipei, Turkmenistan, Ukraine.

The Academic Committee made a selection from those questions in accordance with the structure of the pre-elaborate exams.

* The English version was supervised by a teacher of English.

* The exams were translated into Russian according to the IBO rules.

An Academic Subcommittee collaborated with the Academic Committee in the following activities:

* Preparation of the material needed for each practical test, including biologic material, reagents, instruments, furniture, proper spaces (labs or classrooms).

* Organization of four groups to elaborate each practical test, taking into account the number of participants, space and equipment available in our University and the time estimated for the exams.

* Practical tests 1 and 2 lasted 60 minutes, and practical tests 3 and 4 lasted 90 minutes. For that reason they were conducted in the morning and the afternoon.

The following steps were taken for each practical test (approximately 47 students per shift):

* As the time scheduled for each task was very strict, each classroom had a wall clock.

* Each lab had a classroom next door to store the material so as to ensure a quick resupply of materials, during the shifts in between labs.

* There was a first aids kit in each classroom and lab.

*** Materials for the tests**

Materials for the practical test N° 1: Vegetal Anatomy, Morphology, Systematics and Taxonomy.

Teachers in charge: 5 assisted by 6 collaborators.

Microscopy rooms: 3 per shift.

To perform the practical test, each student had:

- 5 samples (labelled 1-5). Fresh and preserved biologic material.
- 5 slides.
- 5 plates.
- 1 razor blade.
- 1 marker pen for glass.
- 1 tongs.
- 2 hystologic needles.
- 1 dropping bottle containing distilled water and glycerine.
- 1 Petri dish containing Safranin solution.
- 1 Petri dish containing distilled water.
- 1 Microscope.
- Best-quality-printed pictures of micrographies showing details of leaf parts.

Materials for the practical test N° 2: Animal Anatomy, Systematics and Ecology

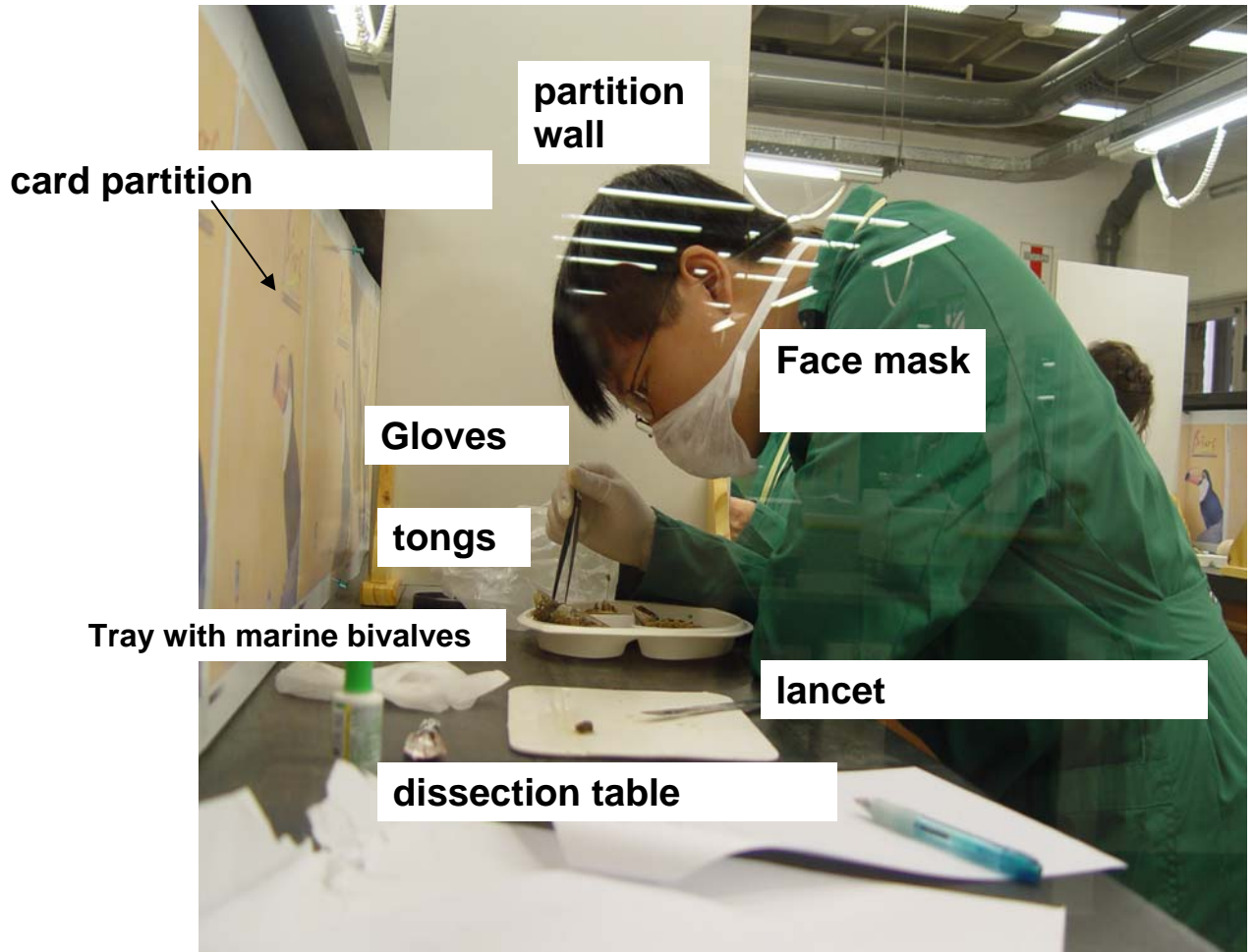
Teachers in charge: 3 assisted by 5 collaborators.

Laboratories: 3 per shift.

To perform the practical test, each student had:

- ✓ Tray containing three samples of marine bivalves numbered 1,2 and 3 (stored in 70% alcohol).
- ✓ Tongs
- ✓ 10 color pins (9 green, 9 red, 9 blue and 1 yellow)
- ✓ A dissection table
- ✓ A lancet
- ✓ 1 pair of disposable gloves
- ✓ 1 face mask
- ✓ 1 magnifying glass

Figure of practical test N° 2



Materials for the practical test N° 3: Biochemistry.

Teachers in charge: 6 assisted by 10 collaborators.

Labs: 3 per shift.

Equipment: 5 spectrophotometers and 3 stoves at 37°C.

To perform the practical test, each student had:

Reagents:

1. Glucose oxidase reagent (ready to use)
2. Glucose solution (unknown concentration).
3. Glucose solution 5 mg. ml⁻¹
4. Distilled water.

Equipment

1. 1 pair of gloves
2. Marker pen (1)
3. 18 1.5 ml-microtubes
4. 2 Automatic pipettes
5. 30 1000 µl tips
6. 3 paper napkins
7. 30 1000 µl tips
8. 30 1000 µl tips
9. 1 calculator

5. 8 Spectrophotometer cuvettes

Figure of material used in practical test N° 3



Materials for the practical test N° 4: Microbiology

Teachers in charge: 4 assisted by 10 collaborators.

Microscopy rooms: 4 per shift.

To perform the practical test, each student had:

Reagents and Equipment:

- Dropping bottle containing Gentian Violet (ready to use)
- Dropping bottle containing Lugol (ready to use)
- Dropping bottle containing Gram decolorizer (ready to use)
- Dropping bottle containing Safranin (ready to use)
- Dropping bottle containing distilled water
- 1 tube rack

- 2 Kahn tubes, containing culture of A and B organisms grown in [Luria-Bertani](#) medium.
- 1 pair of lab gloves.
- 1 face mask.
- 1 marker pen
- Paper napkins.
- 1 Bunsen burner
- Microscope
- Loop
- 4 Slides
- Tray with slide holders
- 1 Plastic bottle containing water for rinsing.
- 1 Disposable glass.
- 1 dropping bottle containing immersion oil
- 1 dropping bottle containing 3% H₂O₂
- 2 [Luria-Bertani](#) agar plates inoculated with A and B organisms.
- 1 Eppendorf tube with 2 oxidase disks.
- 1 Tongs
- 2 Kahn tubes
- 1 Kahn tube with stopper, containing sterile distilled water.
- 1 Plastic Pasteur pipette.
- 3 plates with agar-eosine-methylene blue medium (EMB) (one inoculated with A organism, another with B organism and one without inoculation)
- 3 Tubes containing phenylalanine (one inoculated with A organism, another with B organism and one without inoculation)
- 1 Dropper containing 10% iron chloride
- 3 Kahn tubes with indol-hydrogen sulfide motility medium (SIM) (one inoculated with A organism, another with B organism and one without inoculation)
- 1 Dropping bottle containing Indol reagents
- 3 Kahn tubes containing urea broth (one inoculated with A organism, another with B organism and one without inoculation)
- 3 Kahn tubes with indol ornithine motility medium (MIO) (one inoculated with A organism, another with B organism and one without inoculation)

Figure of material used in practical test N° 4



Positive aspects

- ❖ Task division between the Academic Committee and the Academic Subcommittee.
- ❖ Work of the members of the Academic Committee with translators in working meetings.
- ❖ Questions of very good academic level sent by the above mentioned countries.
- ❖ Space division in well-identified boxes.



ACTIVITIES PROGRAM

COMPETITORS

Sunday 9 July

8.00 pm Dinner Embalse de Río Tercero
Hotel

Monday 10 July

8.00 am Departure Hotel Lobby
10.00 am Opening ceremony Cultural Center "Viejo
Mercado"
12:00 am Hotel registration Río Cuarto Hotel
13.30 pm Lunch AATRAC
3.00 pm Excursion Río Cuarto city

8.00 pm Dinner AATRAC

Tuesday 11 July

8:30 am Departure Hotel Lobby
9.00 am – 11.30 pm First Part Practical exams UNRC
11.45 pm Lunch UNRC restaurant
2.00 pm – 4:30 pm Second Part Practical exams UNRC
6.00 pm Dinner with teachers UNRC restaurant
8:00 pm Departure to Embalse de Río Tercero

Wednesday 12 July

9.00 am Excursion Córdoba's hills

6.30 pm. Dinner Embalse de Río Tercero
Hotel
8.00 pm Party Embalse de Río Tercero
Hotel

Thursday 13 July

9.00 am - 11:30 First Part Theoretical exam Embalse de Río Tercero
Hall
11.45 am Lunch
1.00 pm- 3:30 pm Second Part Theoretical exam Embalse de Río Tercero
Hall
5.30 pm Dinner with the teachers Embalse de Río Tercero
Hotel
7.30 pm Party Embalse de Río Tercero
Hotel

Friday 14 July

8.30 am Departure Hotel Lobby
10.30 am Gaucho-Day" Sociedad Rural de Río
Cuarto
6.00 pm Departure
8.00 pm Dinner Embalse de Río Tercero
Hotel

Saturday 15 July

11.30 pm Lunch Embalse de Río Tercero
Hotel
12.30 pm Departure Hotel Lobby
4.00 pm Closing ceremony Cultural Center "Viejo
Mercado"
7.00 pm Farewell dinner AATRAC

Sunday 16 July

7.00 am Breakfast and departures

JURY AND OBSERVERS

Sunday 9 July

8.00 pm Dinner AATRAC

Monday 10 July

9.30 am Departure Hotel Lobby
 10.00 am Opening ceremony Cultural Center "Viejo Mercado"
 12.45 pm Lunch UNRC restaurant
 2.00 pm Discussion/ translation of practical exams UNRC Central Library
 7.30 pm Dinner UNRC restaurant
 9.00 pm Discussion/ translation of practical exams UNRC Central Library

Tuesday 11 July

10.30 am Departure Hotel Lobby
 11:00 am Excursion (lunch included) Río Cuarto city
 6.00 pm Dinner with the students UNRC restaurant

Wednesday 12 July

8:30 am Departure Hotel Lobby
 9.00 am Discussion/ Translation Theoretical exams UNRC Central Library
 12.30 p.m. Lunch UNRC restaurant
 2.00 pm Discussion/ Translation Theoretical exams UNRC Central Library
 7.30 pm Lunch UNRC restaurant
 9.00 pm Discussion/ Translation Theoretical exams UNRC Central Library

Thursday 13 July

9:00 am Departure Hotel Lobby
 9.30 am Practical test results UNRC Central Library
 11.00 am Excursion Córdoba`s hills
 5.30 pm Meeting with students Embalse de Río Tercero
 Hotel
 7.00 pm Departure Hotel Lobby
 8.30 pm IBO Co-ordinators Meeting UNRC Central Library

Friday 14 July

10.15 am Departure Hotel Lobby
 10.30 am "Gaucho-Day" Sociedad Rural de Río Cuarto
 6.00 pm Departure
 6.30 pm Dinner UNRC restaurant
 8:00 pm Theoretical test results UNRC Central Library

Saturday 15 July

8:30 am Departure Hotel Lobby
 9.00 am Jury session UNRC Central Library
 12.00 pm Lunch UNRC restaurant
 3.30 pm Departure Hotel Lobby
 4.00 pm Closing ceremony Cultural Center "Viejo Mercado"
 7.00 pm Farewell dinner AATRAC

Sunday 16 July

7.00 am Breakfast and departures

*** Reception of delegations**

Delegations were received in the previously assigned hotels. Participants were registered by the Welcome Committee and each participant was given the following elements:

- A bag containing:

- * Badge and pocket program.
- * Full program and ball pen.
- * Brochures containing information about Rio Cuarto City and University.
- * University map.
- * Stationery
- * Argenbio notebook.
- * UNRC notebook
- * Red T-shirt.
- * Leather bookmarker.

The students' bags also contained:

- * Dust coat
- * Calculator.

After IBO registration, delegations checked in and were lodged according to the previously distributed hotel rooms.

On this occasion fees from those countries that asked to pay in Rio Cuarto as well as the annual fee from the Coordinating Centre represented by Dr. Tomas Soukup were collected.

The reception activity took place on Sunday 9 and lasted all day long.

*** Ceremonies**

The ceremonies were organized according to IBO usual protocol. The opening ceremony started with the official presentation of student delegations accompanied by their guides. The President of the Rio Cuarto National University, Ing. Oscar Spada; the City Major, Cdr. Benigno Antonio Rins; and the Secretary of University Policies, Lic. Daniel Malcom on behalf of the National Government, delivered their welcome

speeches. The President of the International Jury, Dr. Hans Morelis, also addressed the audience.

The Closing Ceremony began with the distribution of participation certificates. The farewell speeches were delivered by Dr. Gladys Mori as IBO coordinator in Argentina, Dr Morelis as President of the International Jury, and Dr. Tomas Soukup as member of the IBO Coordinating Centre. A video with a compilation of the most important moments shared during the IBO was shown. According to the tradition, the Argentinean coordinator handed over the IBO cup to the coordinator of the 18^o IBO, Canada 2007. Medals were awarded; the winners also received certificates in recognition for their medals.

Both ceremonies were closed with typically Argentinean cultural performances.

*** Sessions of the International Jury**

The sessions were held at the University Central Library. Each desk had:

- A computer,
- A sign with the flag of the corresponding country,
- The country code number.
- An envelope with copies of the four practical tests.

The places were distributed taking into account the official languages. Russian-speaking countries could follow the discussion on a screen and were assisted by translators who were rented for this event.

Working procedure

* Some delegations translated the exams writing in between the lines; for that reason the IBO COE word-processed their copies with double spacing.

* The Support Committee collaborated in the distribution and assistance of teachers throughout the sessions.

* For the practical part, the IBO Academic Committee showed pictures of the materials to be used for practical tests 3 and 4 and submitted the materials used for practical tests 1 and 2 to the jury consideration.

* Each exam was thoroughly discussed before going over the next. Then, the exams were translated, printed and photocopied in order to supply the amount of

copies required for each delegation. The teachers of each country checked the copies, put them into an envelope which was sealed and signed by them. Each envelope was tagged with the student's code and was thus received by the corresponding student.

The discussion and translation of the practical tests lasted **17 hours** and the session for the theoretical part lasted **19 hours**.

Topics discussed at the meetings of the international jury

* **Results of practical and theoretical tests and statistics.** Each coordinator was given a copy of their students' answer sheets for their control. After agreement over the results, each delegation was given a printed copy of the practical exams, graphs and statistics showing the results. They could also copy these files in their removable disks.

* **Observers' reports:** The inspectors appointed by the International Jury to witness the theoretical and practical exams put the accent on the proper arrangement of spaces, the adequate distribution of students, the orderly way in which they switched rooms for the practical tests having no contact among them, and the perfect condition of the materials.

***Medals:** Gold, silver and bronze medals were distributed according to the t-score method. As a result, 20 gold, 40 silver and 60 bronze medals were awarded.

*** Students' academic activity**

Practical test

It was conducted at the Rio Cuarto National University. Participants were divided into four groups according to each student's code so as **to avoid meetings** among students belonging to the same delegation during the whole working day.

Dust coats of different colours were used to identify each member of the same delegation quickly. Each Student Code was composed of the country code, from **10** to **63**, followed by a third number, from 1 to 4. Colours were distributed as follows:

DUST COAT COLOUR	TYPE OF COMPETITOR (STUDENT)
GREEN	COMPETITOR 1
ORANGE	COMPETITOR 2
YELLOW	COMPETITOR 3
BLUE	COMPETITOR 4

The Academic Subcommittee was in charge of the distribution of students. The switching procedure was the following:

Time	Test N° 1	Test N° 2	Test N° 3	Test N° 4
9-10 hs.	Green dust coats	Orange dust coats	Yellow dust coats	Blue dust coats
10: 30- 11:30 hs	Orange dust coats	Green dust coats	Blue dust coats	Yellow dust coats
11:45- 13:45 hs	Lunch		Lunch	
14:00- 15:00 hs	Yellow dust coats	Blue dust coats	Green dust coats	Orange dust coats
15:30- 16:30 hs	Blue dust coats	Yellow dust coats	Orange dust coats	Green dust coats

For each practical test, each student was given an envelope tagged with his/her code number. The envelope was closed, sealed and signed by his/her coordinator teacher.

During the practical exams, teachers from observer countries went through the classrooms where students were working, so as to learn about the organization of this stage of the competition. They were from: Canada (next IBO host), Peru and Bolivia (first attendance at this event).

All the classrooms were divided into boxes, one for each student; in this way, students from the same country rotated and occupied the same box in each practical test. Boxes were identified by the country flag and the students' codes, as shown in

Identifying sign



Theoretical test

It was conducted at a school in Embalse de Rio Tercero, (the site of students' lodging). Each part (A and B) lasted 2 hours and a half with a break for lunch.

In both examinations, practical and theoretical, students worked orderly and showed no difficulties in understanding the assignments.

*** Socio-cultural activities**

* Welcome dinners were organized separately for teachers and students and there were musical performances in both of them.

* A tango workshop was organized for teachers and musical parties for students.

* Teachers and students enjoyed a "Gaucha" Day with a typical Argentinean lunch, native dances and horse-riding skills.

* Participants and organizers shared a farewell dinner during which all participants received a souvenir as a reminder of this Olympiad (a mulita carved in onyx marble, with a card explaining the characteristics of this Argentine stone) as well as copies of the IBO final ranking.

These activities were meaningful from the social point of view as they were shared by organizers, collaborators and participants, thus promoting cultural exchange.

Daily information

An informative newsletter (Mulita News) was distributed daily during the IBO, in order to provide information about the participants' activities by means of pictures, captions and short paragraphs, and to introduce next day's agenda.

IBO Secretariat

It was in charge of the administrative task consisting in:

- * Storing the enrolment forms and documentation presented by participants into files.
- * Checking receipts of annual fees and preparing the folder submitted to the Coordinating Centre for control.
- * Providing each delegation with envelopes containing copies of the filled out answer sheets (both practical and theoretical tests).
- * Providing each delegation with envelopes containing the results of the statistical analyses of practical and theoretical tests.
- * Checking the participation certificates corresponding to each delegation and putting them into envelopes.
- * Checking the medal certificates, according to the final ranking for their distribution to delegations.
- * Distributing the newsletter "Mulita News" to the participants.
- * Preparing certificates for the collaborators.
- * Preparation and distribution of copies of the final ranking among participants.



GENERAL RESULTS OF THE 17 IBO

54 countries were invited to this edition of the IBO. They were:
Afghanistan, Germany, Australia, Azerbaijan, Belarus, Belgium, Brazil, Brunei, Bulgaria, Canada, Korea, China, Cyprus, Denmark, Spain, United States, Estonia, Finland, Greek, The Netherlands, India, Indonesia, Ireland, Iran, Japan, Kirgyzstan, Kuwait, Lithuania, Mexico, Moldova Mongolia, Mozambique, Nigeria, New Zealand, Pakistan, Poland, Romania, Russia, Singapore, Slovak Republic, Slovenia, United

Kingdom, Czech Republic, Sweden, Switzerland, Tajikistan, Thailand, Chinese Taipei, Turkey, Turkmenistan, Ukraine, Vietnam.

A total number of 48 countries from this list actually participated with the following distribution:

International jury: 137 members as follows: 48 coordinators, 45 delegates, 43 observers and 1 member of the IBO Coordinating Centre.

Guests: 11

Students: 185

Some countries were invited to participate as observers; those from South America were proposed by the 17^o IBO EOC and the others by the IBO Coordinating Centre. They were: Colombia, Chile, Peru, Bolivia, Portugal and Lithuania

Finally, the observer countries were 4: France, Bolivia, Lithuania and Peru with a representative each.

All in all 337 people participated of the 17^o IBO.

On this occasion the absent countries were: Tajikistan, Afghanistan, Brunei, Darussalam, Kyrgyzstan, Mongolia, and Mozambique.

A total number of:

- 120 medals:

* 20 gold medals

* 40 silver medals

* 60 bronze medals

- 457 certificates for participants:

* 337 as participants

* 120 medal certificates

- 600 souvenirs (Mulita carved in onyx marble):

* 337 to participants.

* 263 to collaborators,

were distributed during the 17^o IBO.

The 17^o IBO Organizing Committee received the following gifts:

- * A painting from the President of the International Jury, Dr. Hans Morelis.
- * A cup from the Prague IBO Coordinating Centre, Dr. Tomas Soukup



ACADEMIC RESULTS

The academic results of the 17^o IBO are considered highly satisfactory as proven by the following estimations and statistical data:

The practical tests consisted of 13 activities requiring practical skills along with 38 theoretical questions aimed at drawing conclusions or applying results from the activities. The 17^o IBO Academic Committee assigned 160 points for the practical part of the exam.

The theoretical test, divided into two parts, consisted of:

Part A: 82 questions

Part B: 54 questions

In this case, the 17^o IBO Academic Committee assigned **161** points for the theoretical part of the exam.

During the discussion and translation only **8** questions (including both the practical and theoretical tests) were deleted: **1** question from Practical Test N^o 3, **2** questions from Practical Test N^o 4, **2** questions from Theoretical Part A and **3** questions from Theoretical part B. The amount of deleted questions was the lowest in the IBO history; this fact was praised by the members of the international jury, particularly by its president who acknowledged it as a record. He congratulated the 17^o IBO organizers not only for the excellent academic level but also by the presentation of the exams in English, revealing the effort of the Committee in preparing the exams in a language other than the native one, without diminishing the scientific academic level.

Once the discussion was over, the points assigned to the practical part were kept because the partial scores were reassigned, while the points for the theoretical part were a maximum of **155** points: **80** for part A and **75** for part B.

The following statistical analyses were based on these parameters and the final results.



STATISTIC ANALYSES OF PRACTICAL EXAMS

* The practical exams were:

- * Practical Test N° 1 (Plant Anatomy and Physiology)
- * Practical Test N° 2 (Animal Anatomy, Ecology and Biosystematics)
- * Practical Test N° 3 (Biochemistry)
- * Practical Test N° 4 (Microbiology)

Practical Tests N° 1 and N° 2 lasted 60 minutes, and N° 3 and 4 lasted 90 minutes. The maximum score for each was **40 points**.

The statistical data for each practical test follow:

For practical test N° 1 the minimum observed score was 9.53 points and the maximum observed score was 39.33, very close to the maximum expected score (Fig. 1). Frequency distribution was quite symmetric since 50% of the students obtained a score higher than 24 points out of the maximum expected score of 40 points. 25 % of the students obtained scores higher than 30 points (Fig. 2).

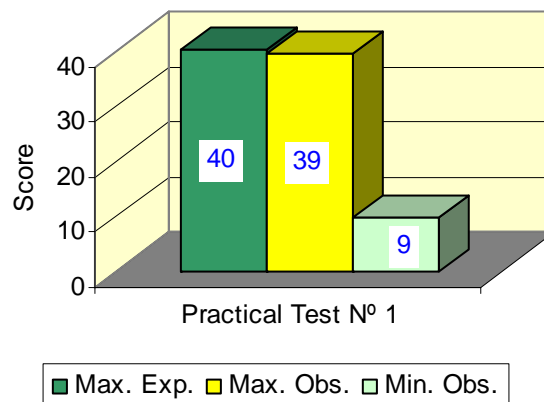


Figure 1: Maximum expected score and maximum and minimum observed score in practical test N° 1.

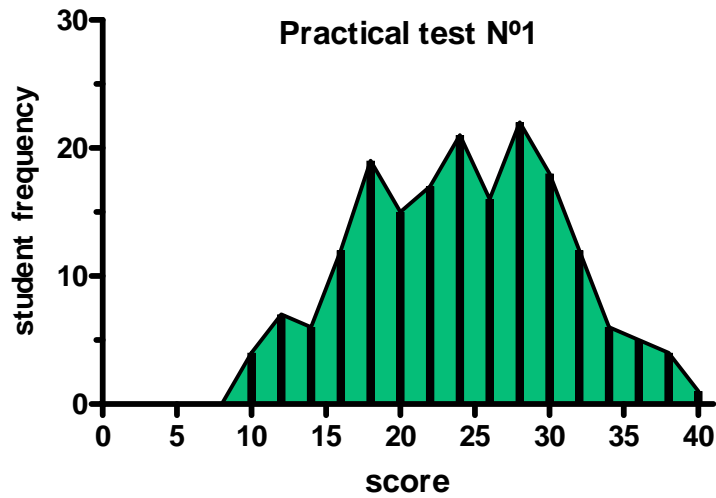


Figure 2: Distribution of student frequency in relation to the score obtained in practical test N° 1

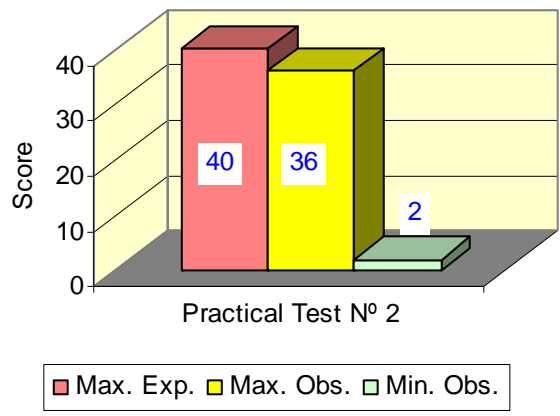


Figure 3: Expected maximum score and maximum and minimum scores observed in practical test N° 2.

In practical test N° 2 the minimum observed score was 2 points and the maximum observed score was 36 points, close to the maximum expected (Fig. 3). Fig. 4 shows the asymmetry in score distribution for practical test 2 due to the low scores observed in two students (2 and 6 points). However, 50% of the students obtained a score equal to or higher than 22 points and 25% surpassed 27 points.

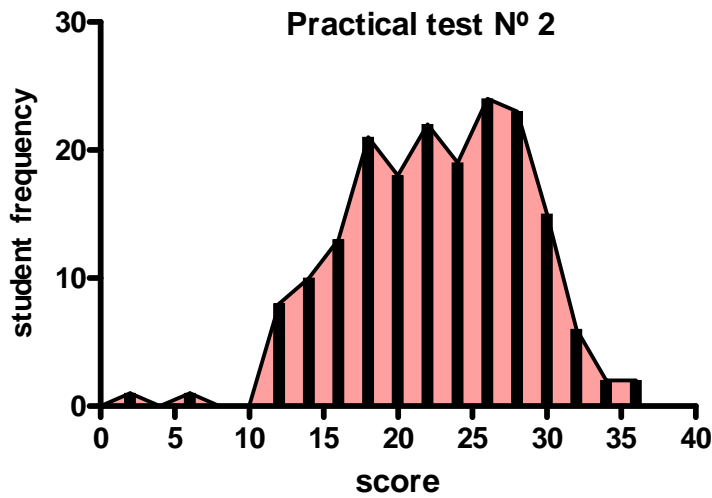


Figure 4: Distribution of student frequency in relation to the score obtained in practical test N° 2

In practical test N° 3 the minimum observed score was 0 points and the maximum observed score was 38.45, again a value very close to the maximum expected (Fig. 5). Fig 6 shows a higher asymmetry in score distribution than practical tests 1 and 2. 23 % of the students obtained a score between 6 and 12 points (first peak of histogram in fig. 6). However 50% of the students surpassed 21 points and 25% obtained a score higher than 27 points.

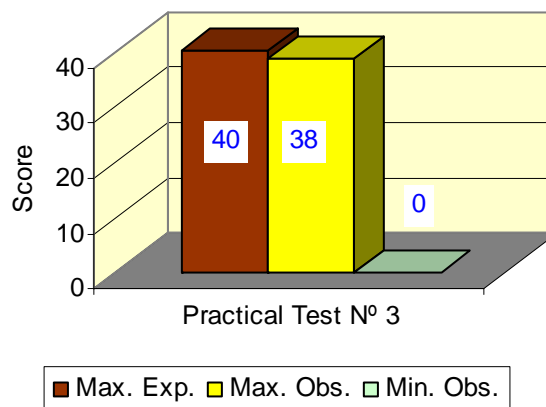


Figure 5: Maximum expected score and maximum and minimum scores observed in practical test N° 3.

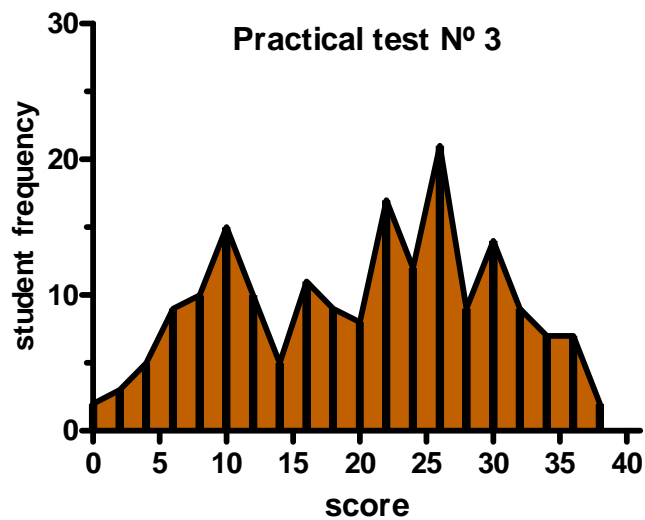


Figure 6: Distribution of student frequency in relation to the score obtained in practical test N° 3.

In practical test N° 4 the minimum observed score was 0 points and the maximum observed score was 36.9, again a value close to the maximum expected (Fig. 7). Fig. 8 shows a symmetric distribution of scores in this practical test. 50 % of students obtained a score higher than 20 points and 25% higher than 24.7 points.

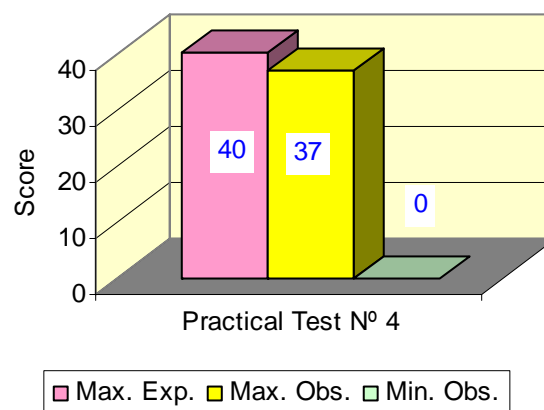


Figure 7: Maximum expected score and maximum and minimum observed scores in practical test N° 4.

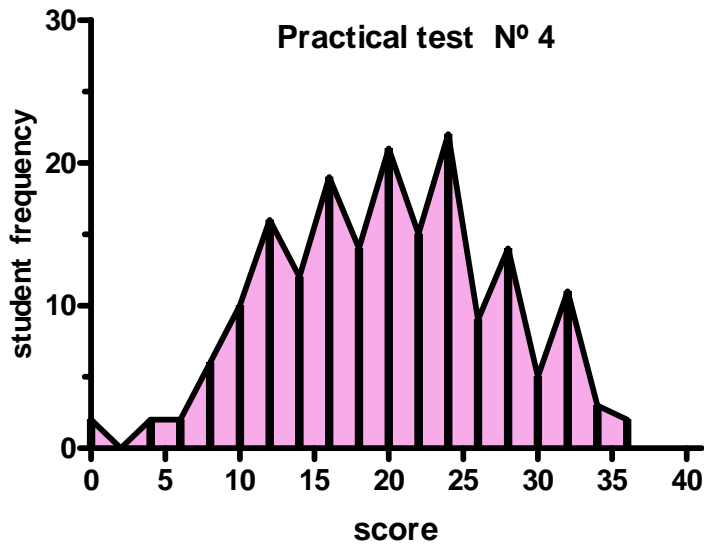


Figure 8: Distribution of student frequency in relation to the score obtained in practical test N° 4.

The comparison between the four practical tests shows meaningful differences ($P= 0.1$) among them (Fig. 9). Practical test N° 1 presented the lowest level of difficulty as seen not only by a higher medium score (24.07) but also by the highest minimum score. Practical test N° 2 presented less dispersion as the medium score was 22.1 points. Practical tests N° 3 and 4 showed very similar average scores (20.4 y 19.8 respectively) though score dispersion was higher in practical test N° 4 (Fig. 9).

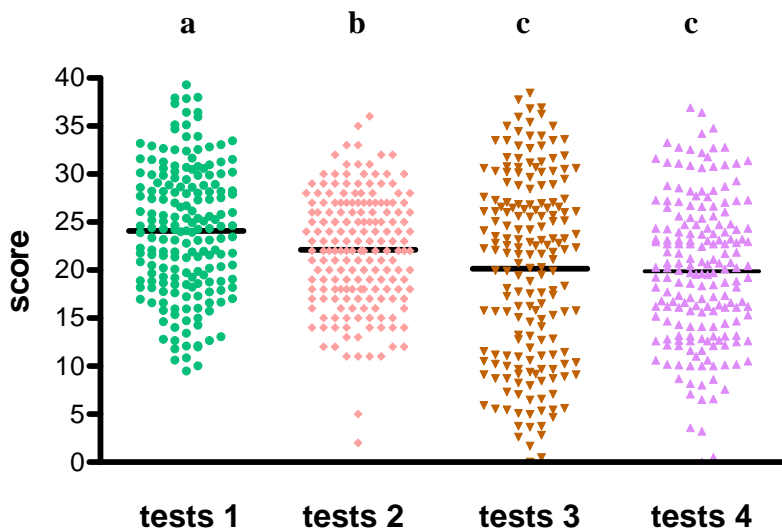


Figure 9: Dispersion in the score obtained by all 185 students in each of the practical tests. Line = average. Different letters (a, b, c) indicate meaningful differences $P= 0.1$; Tukey test.



STATISTIC ANALYSES OF THEORETICAL EXAMS

COMPARISON BETWEEN TOPIC AREAS OF PART A

References:

Total score: **80 points**

Total score for:

Animal Anatomy and Physiology: **14 points**

Biosystematics: **8 points**

Cell Biology: **16 points**

Ecology: **12 points**

Ethology: **4 points**

Genetics: **14 points**

Plant Anatomy and Physiology: **12 points**

COMPARISON BETWEEN TOPIC AREAS OF PART B

References:

Total score: 75 points

Total score for:

Animal Anatomy and Physiology: **16 points**

Biosystematics: **6 points**

Cell Biology: **15 points** (1 deleted question)

Ecology: **12 points**

Ethology: **0 points** (2 deleted questions)

Genetics: **14 points**

Plant Anatomy and Physiology: **12 points**

Theoretical exam: Part A

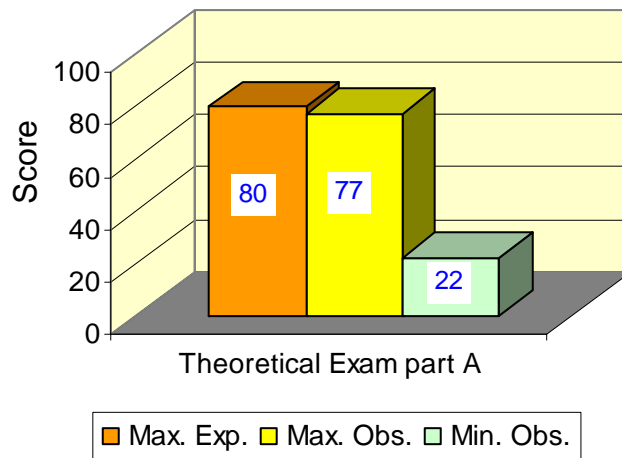


Figure 1: Maximum expected score and maximum and minimum scores observed in theoretical exam part A.

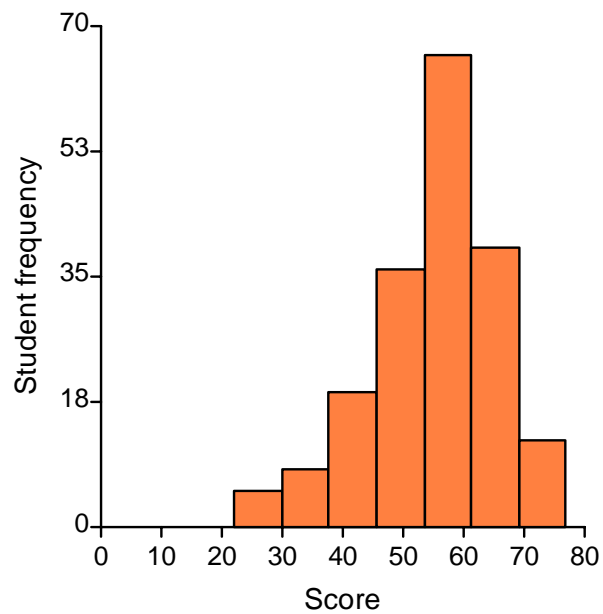


Figure 2: Distribution of student frequency in relation to the score obtained in theoretical exam part A

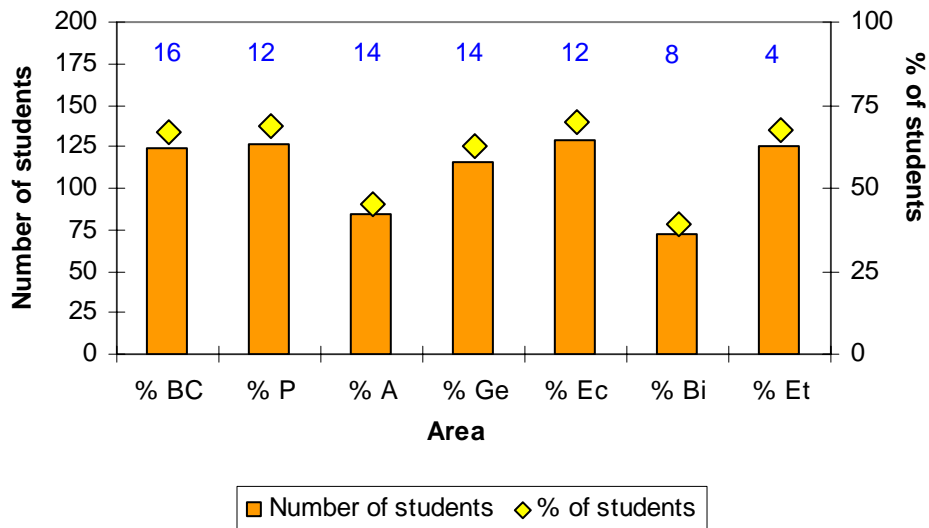


Figure 3: Number and percentage of students that reached and/or surpassed 65% of total average per area of theoretical exam Part A.

BC: Cell Biology, P: Plant Anatomy and Physiology, A: Animal Anatomy and Physiology, Ge: Genetics, Ec: Ecology, Bi: Biosystematics, Et: Biology. Blue numbers: maximum score expected in the area.

Fig. 1 shows the 3-points difference between the maximum expected score and the observed score. Fig. 2 shows the asymmetry in frequency distribution; 50 % of the students obtained a score higher than or equal to 56 points out of a total of 80 points, having answered correctly 70 % of the exam. The highest frequency of students was observed in the range between 53 to 62 points.

Fig. 3 shows that the areas Cell Biology, Plant Anatomy and Physiology, Ecology and Ethology, had a similar degree of difficulty since the percentage of students that reached and/or surpassed 65% of the area total score was similar. The areas that presented higher difficulty in this part of the exam were Plant Anatomy and Physiology and Biosystematics.

Theoretical exam Part B

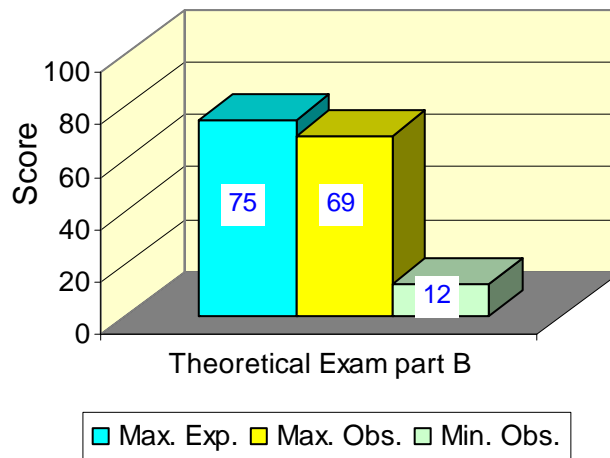


Figure 4: Maximum expected score and maximum and minimum scores observed in theoretical exam part B.

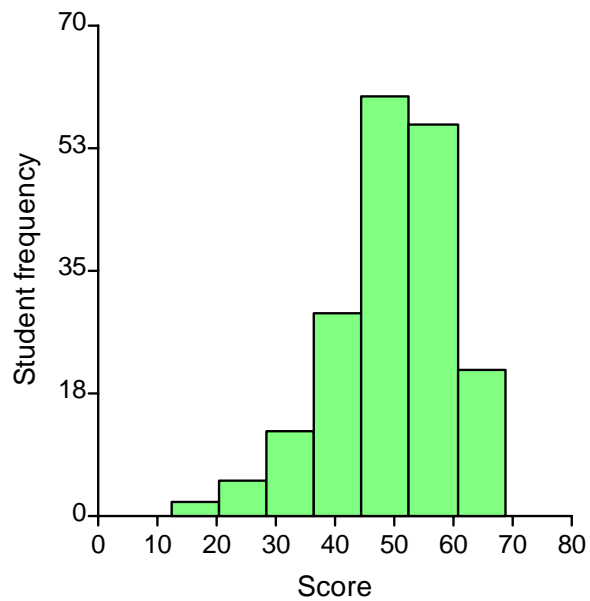


Figure 5: Distribution of student frequency in relation to the score obtained in theoretical exam part B

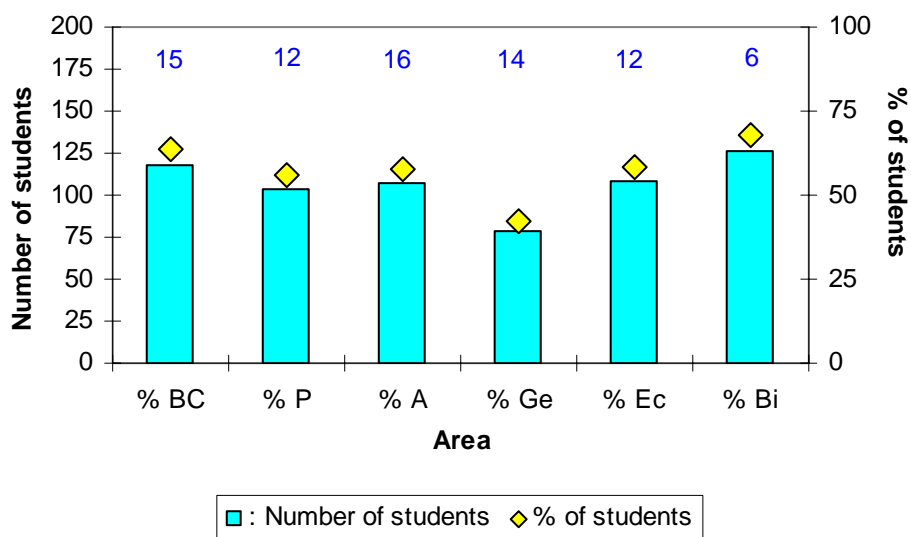


Figure 6: Number and percentage of students that reached and/or surpassed 65% of total average per area of theoretical exam Part B.

BC: Cell Biology, P: Plant Anatomy and Physiology, A: Animal Anatomy and Physiology, Ge: Genetics, Ec: Ecology, Bi: Biosystematics, Et: Biology. Blue numbers: maximum score expected in the area.

Fig. 4 shows the 6-points difference between the maximum expected score and the observed score. Frequency distribution was asymmetric; 50 % of the students obtained a score higher than or equal to 51 points out of a total of 75 points, having answered correctly 68 % of the exam. The highest frequency of students was observed in the range between 44 to 52 points (Fig. 5).

Fig. 6 shows that the areas Cell Biology, and Biosystematics were less difficult, followed by Plant Anatomy and Physiology, Animal Anatomy and Physiology, and Ecology, which presented a similar degree of difficulty. The area that presented the highest degree of difficulty in this part of the exam was Genetics in which only 41% of the students were able to answer 65% of the area total score.

Theoretical exam total statistics (Parts: A+B)

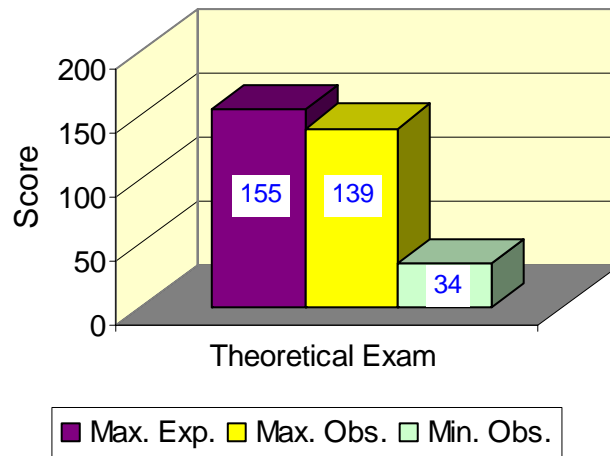


Figure 7: Expected maximum score and maximum and minimum observed score in the theoretical exam as a whole.

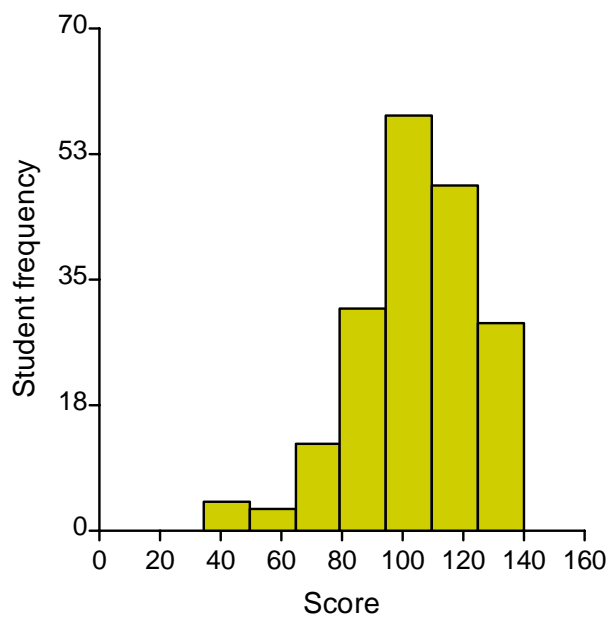


Figure 8: Distribution of student frequency in relation to the score obtained in theoretical exam.

Fig. 17 shows the 16-points difference between the expected maximum score and the observed score. The theoretical exam as a whole shows an asymmetric distribution (Fig. 8) as expected from frequency distribution in parts A and B. 50 % of

the students obtained a score higher than 106 points out of 155 points, having answered correctly more than 68 % of the theoretical exam.

The comparison between both parts of the exam shows that Part A presented a slightly lower level of difficulty than Part B.

Total Exam

When considering the total exam score (theoretical and practical parts), the minimum observed score was 65.2 points and the maximum observed score was 271.5, differing 43.5 points from the maximum expected score (Fig. 9). Fig. 10 shows the asymmetry of obtained scores considering the total exam. The highest frequency is found in the range of 175-240 points. When considering medal distribution, meaningful differences are observed among the average values of each group of students and a very low dispersion among each group's data as expected.

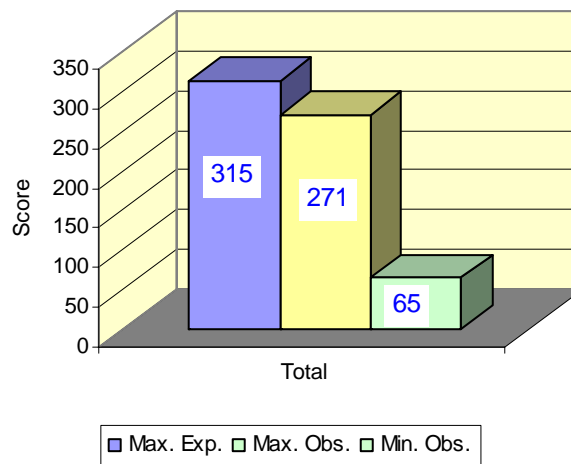


Figure 9: Maximum expected score and maximum and minimum observed scores in the total exam.

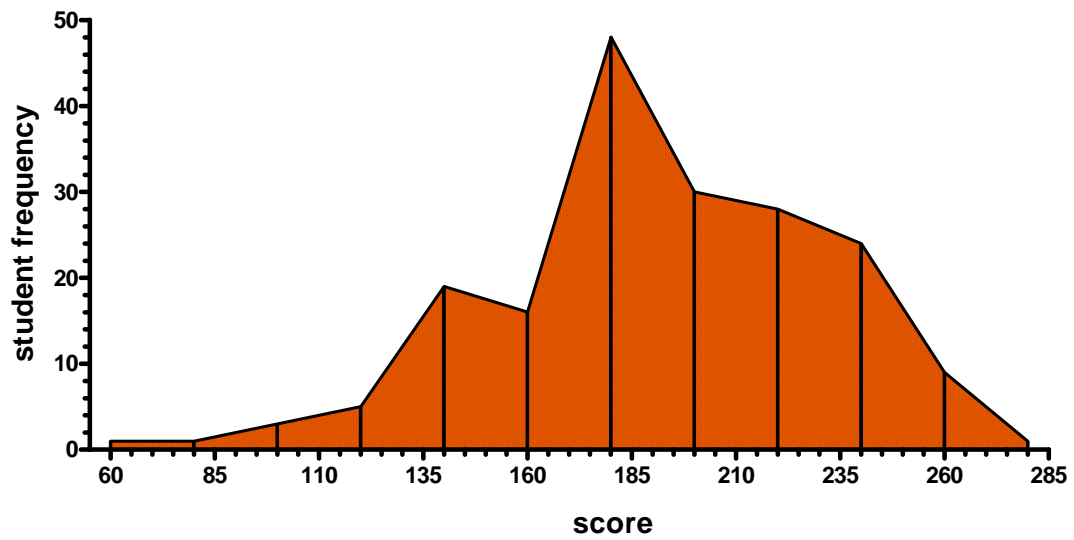


Figure 10: Distribution of student frequency in relation to the total score obtained in the exam.

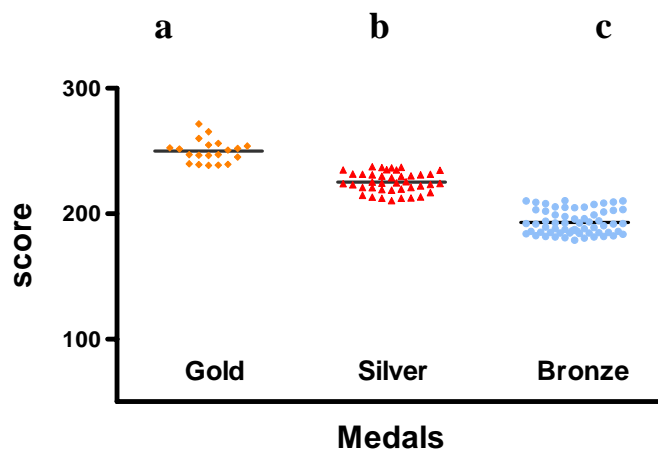


Figure 11: Dispersion in the score obtained by the 121 students who were awarded medals.



FINAL CONSIDERATIONS

The 17th International Biology Olympiad started as a project in 2003 and became a reality during the week of the 9th to the 16th July 2006. Before that, the Executive Organizing Committee carried out different tasks leading to the organization of the academic, social and cultural aspects of the event. Special committees were made up under the coordination of teachers from the Rio Cuarto National University (UNRC) and members from the IBO secretariat, each having specific functions. Approximately 290 people participated in this organization; many of them collaborated voluntarily and intensely before and during the IBO week. The program was carried out as planned. The total number of participants, adult delegates and students, was 339 coming from 52 countries, 4 of which participated for the first time as observers.

The IBO academic activity was specially acknowledged as it was the first time that the exams underwent very few modifications as regards the amount of deleted questions: only 8 out of 187 proposed tasks; that is to say 0.04%. The proposed tasks allowed the evaluation of students' theoretical and practical skills and competences on the basis of which a ranking was determined. The first 120 best scores were awarded medals according to the percentage established by the IBO rules. This Olympiad was financed by the Ministry of Education, Science and Technology and sponsored by other entities and private organizations from different Argentine cities and by UNESCO-Uruguay. It was also sponsored by national, provincial and local government institutions that acknowledged the significance of this event.

The success of the 17th IBO was made possible by the effort of a group of teachers from the Rio Cuarto National University who worked very hard in order to offer an IBO edition with a truly Argentine flavour showing the socio-cultural essence of our country, and a scientific academic level according to the status of the participant countries.