N. 15 - December 1985

This issue of the Newsletter is primarily concerned with:
- information on the preparation of the GIREP '86 Conference,
- reports of international events,
- with much sadness, a commemoration of Roger J. Osborne.

Members are kindly invited to take notice of two important changes reported in the General Information in the last page, concerning
1. the address of Paul Black, and
2. advice for paying fees.

The reasons for asking you to send your fees to London instead of Lausanne are: the fact that the Swiss bank account does not give interest and the need to reduce the time interval between your payment and the Treasurer's knowledge of it. This will, hopefully, smooth out some accounting problems that have troubled the first months of office of this Committee, leading to erroneously asking some members to update already updated fees.

1. GIRED '86 - COSMOS: AN EDUCATIONAL CHALLENGE Elsinore, 16-23 Aug.
Poul Thomsen reports that the preparation of the GIREP 1986 Conference is proceeding well.

Up to now about 150 persons asked to receive the Second Circular, and about 100 have already stated that they intend to participate.

The programme is taking the following shape:
A) Plenary sessions on the following topics (invited papers)
- Exploration of the Solar System (achievements of Cosmos, NASA and ESA).
- Recent developments in the teaching of astronomy, cosmology and space science.
- Stars and galaxies.
- Cosmology and the scientific view of the world.
- Teaching aids and materials.
- Man in the Universe.
B) Parallel sessions (contributed papers)
- Educational use of space laboratories.
- The use of microcomputers.
- Teaching astronomy in primary and secondary school.
- Teaching astronomy at university level.
- Adult education, the general public.
- History of astronomy in the school curricula.
- Educational use of films and other visual aids.
- Students' concepts of phenomena in cosmos.

C) Workshops (discussions and activities)
- Educational use of space laboratories.
- Astronomical experiments and observations in schools.
- Original photographic material in the teaching of astronomy.
- Astronomy and space physics in the school curricula.
- The use of interactive videodisks and microcomputers.
- Other workshops may be arranged.

D) Poster session
Boards and tables for posters on, for instance, software, experimental material, visual aids etc. will be provided.

E) Social events
- Welcome party.
- Visit to Tivoli, Copenhagen.
- Sightseeing: Castle tour including Hamlet's Castle, Kronborg, Conference dinner in Elsinore.

F) Excursion to the Physics Institute of the Royal Danish School of Educational Studies, including the demonstration of a new type of planetarium.

G) Exhibition of teaching aids and materials. Contributions are welcome.

General information
- The language of the Conference is English.
- The Conference will run from Monday morning, August 18, to Saturday noon, August 23. Registration from Sunday, August 17, 3 p.m.
- The Conference is located at: 10-Skelen, Gammel Hellebaekvej 70, DK-3000 ELsinore, Denmark (tel. (0)2/217272)
- The Conference fee is Dkr. 2,650. This includes full board and accommodation in two-bed bedrooms with bath and toilet from Sunday night to Saturday morning. Single bedrooms cost Dkr 1,100 more.
- Accompanying guests are welcome at the same rate as the participants.
- The number of participants is limited to 150. Prompt notification of participation (before 15th January, 1986) will give best chances for enrolment and fulfillment of special wishes with regard to accommodation. Final date for notification is 1st March, 1986.

Contributions
Participants who wish to contribute papers, workshops or posters are kindly requested to inform the local organizers as soon as possible. Selection of contributions for presentation and publication will be based on the extended abstracts and preliminary poster descriptions. Contributors will be informed by the end of March 1986.
Extended abstracts: approx. 400 words (not more than 2 pages A4) read to copy. The top quarter of the first page should start with:
(i) The title of the paper (block capitals)
(ii) The author's full name (lower case letters)
(iii) The author's institution, including full mailing address and telephone number (lower case letters)
The deadline for receiving abstracts is 15 February, 1986
Poster descriptions: about one page A4. Selected descriptions will be included in the preprints booklet and in the final version of the Proceedings. Begin your description in the same way as the extended abstracts.
The deadline for receiving the descriptions is 15 February, 1986. Please enclose a letter explaining how much space and other facilities you need.
Final manuscripts, and final versions of poster descriptions must be handed in during the Conference. The editors will be present to discuss publication matters with the authors.
The mailing address of the Executive office is:
GIRES '86 - The Royal Danish School of Educational Studies
Department of Physics
Emdrupvej 115 B
DK-2400 Copenhagen NV, Denmark

2. MEETING OF NATIONAL REPRESENTATIVES - ELSINORE
In occasion of the GIRES '86 Conference a Meeting of National Representatives will be held, in accordance with art. 10 of the Statute. The Meeting will discuss what the National Representatives and Nation Sections are supposed to do. A more detailed agenda will be distributed at the beginning of the Conference.

3. A SUGGESTION FOR FUTURE CONFERENCES
Prof. Thomas Rossing of Northern Illinois University writes: "Our Fall Term begins on August 18, 1986, as do many Universities in the USA. I suggest holding GIRES Meetings earlier in August."
How many GIRES members encounter prof. Rossing's same difficulties? Please write to the Secretary, so we can make better plans for 1988.
4. GiSET Network: Distribution of Interests
(on a total of 141 replies)

A 12
B 26
C 46
D 56
E 26
F 34
G 37
H 18
I 21
J 34
K 27
L 29
M 11
N 11
O 48
P 28
Q 18
R 10
S 74
T 21

Teaching of specific topics
a 37
b 20
c 34
d 19
e 16
f 22
g 46
h 32
i 24
j 26
k 19
l 36

Key to codes
Interest declared
Publications
A. Alternative technology
B. Assessment
C. Cognitive development
D. Computers in Physics
E. Curriculum dissemination
F. Curriculum evaluation
G. History of Science
H. Independent learning
I. Language in Science
J. Learning theory
K. Mathematics and Physics
L. Philosophy of Science
M. Physics for the least able
N. Physics for the most able
O. Practical work
P. Alternative frameworks
Q. Sex differences
R. Science in Society
S. Teacher training
T. Technology

Specific topics
a. atomic and nuclear physics
b. astronomy
c. electricity
d. electronics
e. fields
f. heat
g. mechanics
h. optics
i. properties of matter
j. relativity
k. sound
l. waves
5. INTERNATIONAL EVENTS

One of the topics listed in the Interest Sheet for the GIREF Network is: "Physics for the most able". At the secondary school level, participating in the Physics Olympiad can be a very stimulating goal for our most able pupils. Preparing their students for the Olympiad can prove to be a stimulating and rewarding experience for the teachers, too.

Although less than 10% of GIREF members seems to be currently interested in the topic "Physics for the most able", the following report of the last edition of the Physics Olympiad may be of interest to all.

1985 PHYSICS OLYMPIAD (by E. Golli)

The 16th International Physics Olympiad was held at Portorož, Yugoslavia, from June 23 to June 30 1985, organized by the Yugoslav Union of Mathematical and Physical Societies. Delegations of five secondary school students and two leaders from the following 20 countries participated: Austria, Bulgaria, Canada, Cuba, Czechoslovakia, Finland, Federal Republic of Germany, German Democratic Republic, Great Britain, Hungary, Iceland, the Netherlands, Norway, Poland, Rumania, Sweden, USSR, Vietnam, and Yugoslavia. Italy, China and the USA sent observers.

The Olympiad is a competition between individuals and has two parts: in the theoretical part the students must solve three problems; in the practical part they must prepare one or two experiments, perform measurements and write a report. Each examination lasts five hours and there is a rest day in between. The competition problems and the experimental facilities are prepared by the organizer. Before each examination the problems are submitted to the International Board which includes the delegation leaders. It is possible to change or reject the proposed problems, but not to propose new ones or change the experimental equipment. The discussion of proposals is conducted parallelly in English and Russian. When the final formulation is agreed upon, the delegation leaders translate the problems into the mother tongue of their participants. The correction of the completed competition papers is carried out by the organizer, but the leaders have the opportunity to raise objections to corrections. In practice, almost every paper is carefully discussed, which eliminates possible misunderstandings due to the language.

The Olympiads have had a considerable stimulative role for the teaching of physics in participating countries, especially in those that have developed a system of selection through competitions between secondary school students. The level of competition problems has been constantly rising: the problems of early Olympiads are now solved in the competitions in schools. Modern experimental equipment at the Olympiads induces interest for new measuring techniques and new experimental skills in schools.

As organizers of the 16th Olympiad we have been aware of this important role of the Olympiads. Our aim was therefore to choose problems which
would:

(i) introduce new fields of physics, not adequately covered in the secondary schools, as well as new experimental techniques (in the practical part),
(ii) require an original approach in solving problems, based more on the understanding of physics and on physical intuition than on mathematical pretentiousness,
(iii) be of practical rather than purely academical interest, and
(iv) be above the level of the national competitions.

The first problem proposed this year in the theoretical competition requires the optimal construction of an aerial array such that one observer receives maximum signal while the other, in another direction, receives no signal. The students used various approaches to solve the problem and were quite successful. In the second problem, the Hall effect is introduced. As this is not taught in secondary schools, the effect was carefully explained in the text so that questions could be answered at an elementary level. The third problem is to discuss the possibility of using Mars to launch a space probe out of the solar system. This requires a smaller launching velocity from the Earth and the question asked to determine the magnitude and the direction of this velocity. Several intermediate steps suggested the way to reduce this complex problem to a series of simple situations which could be treated using the conservation of energy and of angular momentum. Three students solved the problem completely, some a considerable part, while most stopped at some early stage.

In the first experiment a computer was programmed as a multichannel stopwatch and was connected to an induction sensor to measure the acceleration of an AC electric motor. So far the computer had never been used in these competitions, but we now introduced it since the computer has become a piece of modern measuring equipment. Due to the student's different experiences in using computers, we decided to choose a simple phenomenon that could be studied by simple commands. We were pleasantly surprised to see that all the students got acquainted with the computer very quickly.

In the second experiment rather simple instruments were used to measure a magnetic field, a quantity not so familiar to most students at this level. An induction coil was connected to a voltmeter through an electronic circuit which enabled ballistic measurements of the induced voltage and thus the magnetic field. The measuring system had first to be calibrated with the known magnetic field of two coils: then the magnetic field of two magnets, hidden in a block, had to be determined. The time allotted for the experiments was short, but several students showed a great deal of experimental skill. Nevertheless, the general impression is that students do better in the theoretical examination than in the practical one. The success in the experiments indicates a high level of physics teaching in that country, while this may not be true in the case of the theoretical part where a lot can be learned by individual work.
The best student was Patrik Španel from Czechoslovakia, the British students did best in the experimental part, while the Soviet team was the best in the theoretical part and overall.

The Proceedings of the 16th Physics Olympiads with the text of the competition problems and their solutions, the Statutes and the Syllabus of the Physics Olympiads can be ordered from the author.

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FIRST INTERNATIONAL CONGRESS OF RESEARCH ON SCIENCE AND MATHEMATICS EDUCATION organized by "Enseñanza de las Ciencias" - Universitat Autònoma de Barcelona and Universitat de Valencia (by D. Gil-Perez)

"Enseñanza de las Ciencias" (E.C.) is a research journal which is trying, since 1983, to introduce research on science and mathematics education to Spanish and Latinamerican teachers. Today E.C. has near to 2500 subscribers, a clear sign of the existence of interest for educational research among teachers. (Research journals do not usually have many subscribers: the "European Journal of Science Education", for instance, has no more than one thousand). E.C. not only aims to diffuse the results of research, but also to stimulate it and to improve it (through, for example, requirements for accepting papers). Of course this journal doesn't attempt to compete with the international journals. On the contrary, it tries to make teachers aware of the necessity of reading other research journals too. In fact, most of the Spanish teachers who now read "Science Education", the "Journal of Research in Science Teaching", the "European Journal of Science Education", the "Journal of Biological Education", "Studies in Science Education", and so on, have known them through E.C.

E.C. also tries to give information about Congresses and Symposia, and the number of Spanish teachers who attend them has grown very significantly. But, here again, we believe that it is necessary to bring this kind of events nearer to the teachers. This is the reason why E.C. has undertaken to organize periodic Congresses of Research on Science and Mathematics Education. The first was held in Barcelona from 25th to 28th September '85. A few figures can give an idea of the outcome of this event.

- 500 attendants (selected among more than 1500 pre-inscriptions), coming from thirteen countries: Argentina, Brazil, Costa Rica, France, England, Israel, Italy, Nicaragua, Portugal, Spain, Switzerland, Uruguay, Venezuela.

- 100 papers accepted for oral communication and another hundred accepted as posters. Long summaries of the papers accepted for oral presentation were published in a special issue of E.C. and distributed to the participants at the beginning of the Congress.

- 20 workshops, six of which were organized by foreign specialists in science and mathematics education, namely:
6. OBITUARY

With deep regret we announce the sudden and untimely death of Roger J. Osborne, whose substantial contributions to research on conceptual development and other related topics will not be soon forgotten.

ROGER JOHN OSBORNE (by John Gilbert, Univ. of Surrey)
(This appreciation appears by kind permission of Physics Education Magazine).

The death of John Osborne took place in a car accident at Hamilton, New Zealand, during June 1985. He was reader in Physics and Director of the Science Education Research Unit at the University of Waikaito, there. His passing, at the early age of 45, should be marked, for he made an immense contribution to science education both within New Zealand on a worldwide basis.

After a degree in physics at the University of Auckland and a period as a school teacher, he moved to the University of Waikaito, initially as a lecturer in physics. His interests gradually evolved toward physics education and, following a doctorate in Physics Education at Waikaito, he founded, with the late Peter Freyberg, the Science Education Research Unit. This interdepartmental unit straddling the sciences and education rose to international prominence during the six years before the deaths, over a short space of time, of both Osborne and Freyberg. His basic commitment was to the pragmatic improvement of science teaching and learning at primary, secondary and tertiary levels. S.E.R.U. was built as a confederation of staff from the University and Hamilton Teacher's College, research fellows funded from a variety of sources and many school teachers, under Roger Osborne's gentle and insightful guidance.

The research stance taken was ethnographic, with detailed portraits being painted of students' understanding of the ideas of science,
teachers' perception of the nature of learning and the interactions that form the substance of worthwhile classrooms. The research output was prolific, with literally hundreds of detailed reports being produced. These formed the foundation of both an extensive service programme which reached throughout New Zealand, and also a book (R. Osborne and P. Freyberg - 1985 - Learning in Science. Auckland and London: Heinemann) which will be an invaluable source of ideas and data for years to come.

Roger Osborne was the epitome of an academic: quiet, meticulous, persistent and accurate in scholarship. As a teacher he was always available and influential, for his students are already making an impact on many aspects of science education. His ever-supportive family, especially Alison, Peter and Brian, will be bereft. His many international friends, who were made so welcome at S.E.R.U., will grieve both personally and for the loss to science education. They will take comfort from having known him, for he was one of the leading lights of his generation, but will forever ask: What might have been?

7. NEW JOURNAL

A new journal for Physics teaching was born this year in Argentina. An attractive n°1 of the "Revista de Enseñanza de la Fisica", published by the Asociacion de Profesores de Fisica de la Argentina (APFA), was issued in June 1985.

An ancient balance impressively illustrates the journal's blue and white cover, while the 60-page contents includes articles on the conceptual aspects of physics teaching, on the possible roles of history of science in science education, on the role of experimental work in schools, on the history of physics, on new ways of introducing lab experiments and on low-cost devices.

Dr. Alberto Meitzegui, who is a member of GIREP, figures in the Editorial Board.

It is good to know that a new journal has begun its existence. May it fulfill its aims and meet with success and long life!

Revista de Enseñanza de la Fisica, Suipacha 531, 2000 ROSARIO (Pcia de Santa Fe), Argentina
Subscription for two numbers:
- members of APFA: free
- foreign subscribers: US $ 13.00

8. FORTHCOMING CONFERENCES

1. JOURNEES INTERNATIONALES SUR L'EDUCATION SCIENTIFIQUE
Chamonix, 3-5 February 1986
organized by Centre National de la Recherche Scientifique.
Unfortunately this Newsletter appears too late for you to apply for participation to the Journées Internationales de Chamonix, that are organized each year since 1979 by the CNRS. Nevertheless,
this announcement is made to give those who may be interested the
certainty of writing to the organizers asking to be included in
their mailing list for next year.
The aim of the meeting is to bring together people concerned with
education "from the kindergarten to the university", to discuss va-
rious themes related to the teaching of science. The 1986 Journées
are concerned with: "Scientific thinking and everyday life". Past
topics were: "Theory and practice of experimental processes" (1979);
"Concept building processes in physics" (1980); "The diffusion of
scientific knowledge through teaching and popularization" (1981);
"Informatics and science education" (1982); "What kinds of research
to renew the teaching of science" (1983); "Signs and communication
in the teaching and the popularization of science" (1984); "Science
education and the education for the working life" (1985).
The Acts of the Journées have become increasingly bulky (240 pages
in 1979; more than 800 in 1984). They can be ordered from the organ-
izers and cost from a minimum of 30.00 FFr for the first volume
to 96.00 FFr for 1984. They are in french.
The Journées are structured in:
- Plenary sessions,
- Communications,
- Workshops, and
- Poster session.
The language is french.
Further information may be obtained from:
CNRS - Formation, 27 rue Paul Bert, 94204 IVRY Cedex, France

2. CONFERENCE ON TEACHING MODERN PHYSICS TOPICS IN INTRODUCTORY
PHYSICS Fermilab, Batavia IL (USA), April 1986
organized by: Fermi National Laboratory, A.A.P.T., I.C.P.E.,
Friends of Fermilab. Partial financial support from R.S.P.
This four-day Conference (exact dates yet unknown) plans to bring
together 50 teachers engaged in higher education with 50 high-school
teachers for a briefing on current research topics. This will be
followed by the development of plans and materials that will enable
these topics to be taught at an introductory level. The initial
meeting will be followed by a follow-up to be held in San Francisco
Further information can be obtained from:
Dr J. N. Wilson, Modern Physics Conference, A.A.P.T., Dept. of
Physics, University of Maryland, COLLEGE PARK, MD 20740 (USA)

3. TRENDS IN PHYSICS EDUCATION Sophia Univ., Tokyo, 25-29 Aug. 1986
organized by I.C.P.E.-I.U.P.A.P.
Further information from:
Prof. K. Shimoda, Chairman
Japanese National Committee
Faculty of Science and Technology
Keio University
3-14-1 Hiyoshi, Kohoku-ku
Yokohama 223, Japan
4. CHAOS IN EDUCATION  Balaton (Hungary), May 1987
organized by: I.C.P.E.-I.U.P.A.P. and National Centre for Educational Technology (Veszprémen)
International Workshop on teaching non-linear phenomena (bifurcation, structure formation, chaos, catastrophe, etc.) at school and university level in mathematics, physics, chemistry, biology economy, with the help of microcomputers.
Further information from: Prof. George Marx, Dept. of Atomic Physics, Roland Eötvös Univ., Fuskin utca 5, BUDAPEST 1088, Hungary.

9. MEETINGS OF NATIONAL ASSOCIATIONS

Further information from: Dr. A. Klein, Stachelsweg 28, 5000 KOLN 91, FRG

A.A.P.T. (American Association of Physics Teachers) - U.S.A. Columbus (Ohio), 23-27 June 1986 (Joint Meeting with APS)
Further information from: A.A.P.T. - 5110 Roanoke Place, Suite 101 College Park MD20740, USA

10. BONUS FOR 1985 MEMBERSHIP

All members who have updated their 1985 fee will receive, directly from George Marx, the two-volume publication: MICROSCIENCE - Proceedings I and II - International Workshop on using microcomputers in Science Education. The publication is expected to be completed early in 1986.

11. FROM THE EDITOR

1) I remind members that all contributions to the Newsletter are welcome. Please feel free to write on any topic that seems to you to be interesting, including personal teaching experiences or didactical developments, information on new books, etc.

2) Since the June edition of the GIREP Network I received the following Interest sheets:
Ashby, Awunor-Renner, Barojaras-Weber, Brucker, Cavaggioni, Chimonides, Davis, Deeson, Eckstein, El-Lakkani, Ellermeijer, Engels, FitzGibbons, French, Herrmann, Hrastar, Kovacs, Macfarlane, Maitzegui, Mattila, Moreno, Nelson, Otero-Gutierrez, Rossing, Siemen, Voutsas, Waddell. They will be included in the updated edition of the Network, due to be printed next June.

Silvia Pugliese Jona
General Information

GIREP COMMITTEE

President Paul Black, Centre for Educational Studies, King's College London (KCL), 552 King's Rd, London SW10 QAU, U.K. (t.01-351 2488)
Vice-presidents George Marx, Dept. Atomic Physics, R. Eötvös Univ., Puskin u. 5, Budapest 8, PE 327, 1088 Hungary (telex 225459 - t.361/131-643)
Piet Lijnse, Rijksuniversiteit, 3508 TA Utrecht, pub 80005, The Netherlands (t.09/3130531179)
Secretary Silvia Pugliese Jona, via Sen Nazario 22, 10015 Ivrea (Turin), Italy (t. 0125/49869)
Treasurer Brian Davies, The Institute of Physics, 47 Belgrave Sq., London SWI X 8QX, U.K. (telex 918453 - t.01/2356111)

FEES

The yearly fee is the equivalent of $10.00 US at the rate of exchange current at the date of application for membership or renewal of membership. The sender must pay his or her own bank charges and mailing costs. There are four possible methods for payment:
1) Fees from Italy must be paid in Italian Lire, to Marisa Michelini, Istituto di Fisica dell'Università, via Campi 213/A, 41100 Modena.
2) Fees from countries other than Italy may be paid in Lst, made out to "GIREP account 90301245" and sent to Brian Davies, The Institute of Physics, 47 Belgrave Sq., London SWI X 8QX. This is the preferred method of payment.
3) Fees from countries other than Italy or Great Britain may also be paid in Swiss Francs, made out to "GIREP account 375089-91" and sent to Crédit Suisse, 1002 Lausanne, Switzerland.
4) Fees from countries where the above procedures are very difficult or impossible may be paid directly to Prof. G. Marx after having agreed on a procedure with him. Prof. Marx's address is: Dept. Atomic Physics, R. Eötvös Univ., Puskin u. 5, Budapest 8, PE 327, 1088 Hungary.

Please note: The accounting year runs from January to January but if application forms and fees arrive after the month of September membership will - unless the applicant specifies otherwise - become effective at the beginning of the following year.

APPLICATIONS - NEW MEMBERS

Applicants for membership should require the application form from the Treasurer.

INQUIRIES - CHANGES OF ADDRESS

Inquiries concerning fees should be addressed to the Treasurer. Other inquiries may be addressed to the Secretary or to any member of the Committee.
Members are warmly invited to send notice of any change of address to the Secretary.

This issue of the Newsletter is printed by:
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